

PART
1



Gender Diversity in Biofouling

A survey analysis on women in biofouling

Published* in 2023 by the

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Cover and Design by Luke Wijsveld

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Please cite this document as: IMO-Norad TEST Biofouling Project, 2023, Gender Diversity in Biofouling.

TEST Biofouling:

The “Accelerating Transfer of Environmentally Sound Technologies through demonstration pilots to reduce biofouling and related emissions” (TEST Biofouling) Project in collaboration with the Norwegian Agency for Development Cooperation (Norad) and the International Maritime Organization (IMO) assist developing countries to build their knowledge on control and management of biofouling and showcase effective approaches to biofouling management and the mitigation of environmental risks associated with the transfer of Invasive Aquatic Species (IAS) through biofouling by means of demonstration projects at both regional and country level.

<https://testbiofouling.imo.org>

GloFouling Partnerships:

Building Partnerships to Assist Developing Countries to Minimize the Impacts from Aquatic Biofouling (GloFouling Partnerships) is a collaboration between the Global Environment Facility (GEF), the United Nations Development Programme (UNDP) and the International Maritime Organization (IMO). The project aims to develop tools and solutions to help developing countries to reduce the transfer of aquatic invasive species through the implementation of the IMO Guidelines for the control and management of ships’ biofouling.

www.glofouling.imo.org

Funding Agency:

Norad - the Norwegian Agency for Development Cooperation - is a professional body under the Ministry of Foreign Affairs (MFA). In matters concerning Norway’s climate and forestry initiative, Norad is a subordinate of the Ministry of Climate and Environment (KLD). Norad’s work is founded on instructions and allocation letters from the Norwegian ministries.

www.norad.no

Executing Agency:

IMO - the International Maritime Organization – is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships.

www.imo.org

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1.0. Abstract:

This research report has been commissioned by the IMO-NORAD TEST Biofouling Project and its Gender Action Plan. This report aims to explore the spread of gender diversity within the maritime sector, with a particular focus on the domain of biofouling. The maritime sector, encompassing shipping, logistics, offshore exploration, and marine research, plays a vital role in global trade and economic development. However, achieving gender diversity and inclusivity within this industry has been a persistent challenge. This report presents the findings of a comprehensive study that collected and analyzed responses from 35 participants through an online survey, aiming to assess the constraints faced by women in biofouling globally and in participating countries. The GEF-UNDP-IMO GloFouling Partnerships supported the distribution of this survey during the Arab Women in Maritime – Biofouling Management Workshop (AWIM-BMW) organized in Jeddah, the Kingdom of Saudi Arabia (10-11 May 2023).



1.1. Research and Methodology:

This research report is based on data collected through an online survey specifically designed to gather insights from professionals working in various roles within the industry. The survey served as a means to understand the current state of gender representation and shed light on the experiences and perspectives of individuals working in the field of biofouling.

By utilizing both quantitative and qualitative research methods, the collected data has undergone a rigorous analysis. Statistical techniques have been employed to identify trends, patterns, and potential correlations related to gender diversity within the maritime sector. These statistical insights provide a quantitative understanding of the representation of women in different roles and levels within the industry.

Furthermore, thematic analysis has been conducted to delve deeper into the qualitative responses provided by the survey participants. This qualitative analysis allows for a richer exploration of the participants' motivations, challenges, and aspirations in pursuing careers in the maritime particularly biofouling industry. By extracting and examining key themes and narratives, a more comprehensive understanding of the experiences of women in the sector has been gained.

The combination of quantitative analysis and thematic exploration of the survey responses allows for a comprehensive understanding of gender disparity in the biofouling sector. The insights gained from this research will not only contribute to the broader discourse on gender diversity within the maritime industry but also serve as a catalyst for positive change, promoting inclusivity and cultivating a more equitable and diverse workforce.

1.2. Objective:

The primary objective of this survey-based research is to assess the current state of gender diversity within the biofouling domain of the maritime sector. By collecting responses from industry professionals, and other stakeholders, we aim to gain insights into the representation of women in various biofouling-related roles, such as research, development, management, and policy-making. Furthermore, this study seeks to identify any prevailing challenges or opportunities that may influence gender equality within the field.

The findings of this research report hold significant value for various stakeholders in the maritime and biofouling sectors. Policymakers can draw upon these insights to inform and shape policies and initiatives aimed at promoting gender diversity and inclusivity within the industry. Industry leaders and organizations can use the findings to develop strategies for fostering a more inclusive and supportive work environment, ensuring equal access to opportunities and career advancement for all individuals. Additionally, the research contributes to the existing literature on gender diversity within the maritime sector, filling gaps in knowledge and providing a foundation for further exploration and discussion on this important topic.

1.3. Executive Summary:

This survey was commissioned by the TEST Biofouling project to assess the degree of gender diversity and equality prevalent in maritime and shipping companies. The survey aimed to gather information on company policies, training programs, composition of leadership positions, special initiatives for women, recruitment and promotion processes, as well as gender disparities and opportunities for women in the biofouling sector. The survey also explored the benefits of increasing

the representation of women in these fields.

The findings of the survey indicate that while some companies have adopted Diversity and Inclusion policies, there is still room for improvement.

- A significant number of companies lack training programs specifically aimed at women, which could be crucial for their professional development.
- The composition of boards of directors and senior management positions also demonstrates a gender imbalance, with women being underrepresented in these leadership roles.
- Furthermore, the survey revealed that companies need to implement stronger policies to ensure gender equality in recruitment and promotion processes. While some companies have taken steps in this direction, there is a need for greater support and initiatives to address gender disparities in the biofouling sector and related fields.
- Disparities in pay, promotion opportunities, and the treatment of men and women in terms of respect, recognition, and leadership positions were also identified.

However, it also highlighted several positive aspects. Some companies have implemented special policies such as **maternity leave benefits, flexible working hours, and career development programs**

for women. It is encouraging to see companies recognizing the importance of supporting women in their professional journeys. Additionally, there are regional and national associations for women in maritime, and some companies actively support these associations or encourage their women employees to be part of them.

The survey also shed light on the skills and traits that are important for success in the biofouling sector, emphasizing **the need for initiatives and programs** that support the advancement of women in these industries. **Increasing the number of women** in these fields can **bring numerous benefits**, including diverse perspectives, enhanced innovation, and improved organizational performance.

While progress has been made, the survey **revealed the need for greater efforts to promote gender diversity and equality** in maritime and shipping companies, particularly in the **biofouling sector**. Companies should strive to adopt comprehensive Diversity and Inclusion policies, implement training programs targeted at women, and ensure gender equality in recruitment and promotion processes. By fostering an inclusive and supportive environment, companies can discover the real potential of their workforce and contribute to a more equitable and thriving industry.



2.0. Introduction:

The maritime sector plays a pivotal role in global trade, transportation, and economic development. It encompasses various industries, ranging from shipping and logistics to offshore exploration and marine research. Despite its critical importance, the maritime sector has historically faced challenges in achieving gender diversity and inclusivity across its domains. This research report focuses on understanding the status of gender diversity within the context of biofouling, a prominent concern in maritime operations.

Biofouling poses challenges in various industries, including shipping, offshore oil and gas, and marine infrastructure, increased fuel consumption, operational costs, and the potential for the introduction of invasive species. It affects the efficiency, performance, and lifespan of submerged structures. Effective management and prevention strategies are necessary to mitigate the negative impacts of biofouling and ensure the optimal functioning of marine systems and equipment. Given its impact on vessel performance and ecological balance, addressing biofouling has emerged as a critical priority for the maritime sector.

The Gender Dimension of Biofouling:

While numerous studies have examined the technical aspects of biofouling prevention and mitigation, little attention has been given to the gender dimension within this field. Understanding gender diversity within the maritime sector, specifically in biofouling, is crucial for several reasons. First, gender diversity promotes inclusivity and fosters innovation by providing broader perspectives and experiences. Second, a gender-balanced workforce has enhanced productivity and contributed to better decision-making processes.

Several reports and studies have highlighted the gender disparities within the maritime sector. In mid-2020, a report by BIMCO and ICS showed that 1.2% of seafarers are women, although the numbers of female seafarers has increased by 45% compared with findings five years earlier, in 2015. Across respondents, women make up some 2% of their seafaring personnel.¹ This underrepresentation is attributed to various factors, including cultural biases, lack of awareness, and limited opportunities for career advancement. Addressing these issues requires a comprehensive understanding of the specific domains within the maritime sector, such as biofouling, to identify potential barriers and develop targeted strategies for promoting gender diversity.

Biofouling:

Biofouling refers to the unwanted accumulation of marine organisms, including algae, barnacles, and molluscs, as well as their excretion products, on submerged surfaces such as ship hulls, piers, and offshore structures. This process involves the adhesion and buildup of micro- and macroorganisms, leading to the restriction of flow in tubular systems and the impairment of process equipment.

¹ <https://www.imo.org/en/MediaCentre/PressBriefings/pages/WIM-Survey-2021-report.aspx>

All in all, this research report sets out to examine the status of gender diversity within the maritime sector, focusing specifically on the domain of biofouling. By shedding light on the existing gender disparities and understanding the challenges and opportunities within this field, the report aims to promote greater inclusivity and gender equality. The following sections will present the findings of the survey, offering a comprehensive overview of the current state of gender diversity in biofouling within the maritime sector.

2.1. Respondent Profiles-Current Role/ Designation:

The respondents of the survey encompassed a diverse range of roles within the maritime sector, reflecting the multidisciplinary nature of biofouling management. The participants included professionals responsible for marine pollution control, ensuring the safe disposal of biofouling waste during dry dock operations, and monitoring vessels in harbours to prevent the discharge of hull-cleaning waste. Additionally, individuals in positions such as Marine Safety Officer, working with the Ministry of Works and Transport, were involved in coordinating hydrographic surveys, dredging works, and charting waterways. Legal and technical support was provided by respondents who offered legal advice, issued maritime books, and handled registration and certification matters.

Furthermore, representatives from governmental organizations played a significant role in the survey. Consultants specializing in anti-biofouling/bio-corrosion provided expertise in the field, while maritime training advisers and principal investigators focused on training and research related to aquatic ecosystems and marine biodiversity.

Some respondents were actively engaged in raising awareness about biofouling through teaching,

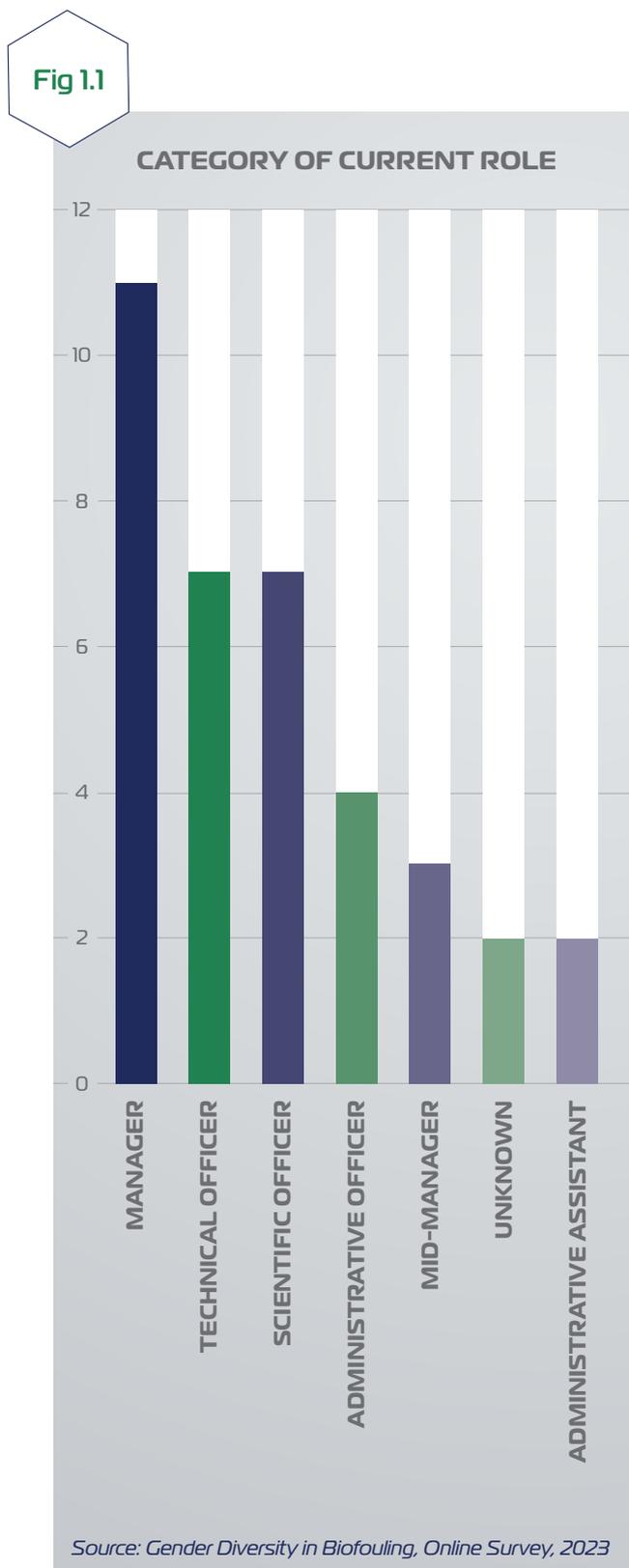
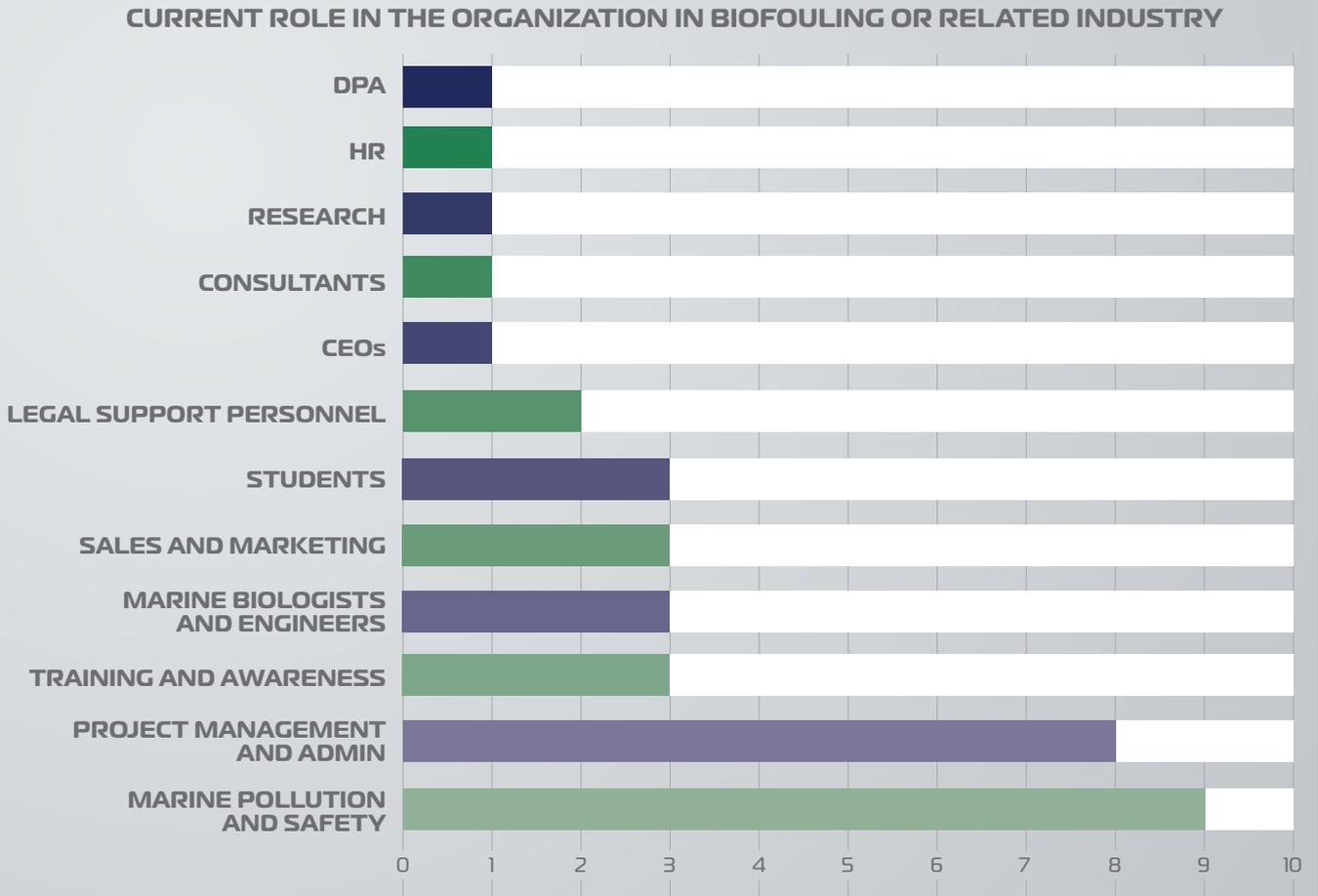


Fig 1.2

Source: Gender Diversity in Biofouling, Online Survey, 2023



carrying out awareness campaigns, and participating in cleaning activities. Project managers, CEOs, and sales and marketing professionals contributed to the technological advancement and commercial aspects of biofouling management. Roles responsible for maritime transport regulations, waste management, and sustainable shipping also made valuable contributions to the survey.

The survey respondents comprised a diverse group of professionals ranging from marine pollution control officers, safety officers, and legal support personnel to government representatives, consultants, researchers, and educators. Their collective expertise and diverse perspectives provide a comprehensive understanding of the current state of gender diversity in biofouling within the maritime sector.

2.2. Motivations for Pursuing a Career in the Maritime/Biofouling Industry: Insights from the Respondents

The motivations expressed by respondents for pursuing a career in the maritime/biofouling industry encompass a wide range of factors, highlighting their passion, personal goals, and recognition of the industry’s significance in various domains:

Environmental Conservation:

Several participants emphasized their passion for environmental conservation and desire to contribute to protecting the marine ecosystem. They were motivated by the opportunity to address biofouling and its impact on the environment.

Breaking Gender Stereotypes:

Some respondents mentioned their motivation to work in a male-dominated industry to challenge gender stereotypes and prove that women are equally capable. The opportunity to make a positive impact and drive gender equality in the maritime/biofouling field drove their career choices.

Fascination with the Maritime Sector:

Many individuals expressed a deep fascination with the maritime industry, recognizing its dynamic nature and the vast opportunities for exploration and growth. They were drawn to the industry’s pivotal role in global trade and transportation, with a realization that a significant portion of everyday commodities rely on maritime transport.

Emerging Field and Regulatory Gaps:

Some respondents highlighted their interest in emerging topics such as biofouling and recognized the need for

regulations, policies, and administrative attention in their respective countries. The desire to address regulatory gaps and contribute to the development of effective biofouling management strategies motivated them to pursue careers in this field.

Research and Innovation:

A few respondents mentioned their involvement in innovative research or the development of antifouling systems. Their motivation stemmed from the opportunity to make significant scientific contributions to the understanding and management of biofouling.

Love for the Ocean and Sailing:

Several participants expressed their love for the ocean and sailing as a driving force for their career choice. The allure of being connected to the marine environment and the excitement of maritime activities propelled them towards this industry.

Fig 1.3

MOTIVATIONS FOR PURSUING A CAREER IN THE MARITIME/BIOFOULING INDUSTRY



Source: Gender Diversity in Biofouling, Online Survey, 2023

Socio-economic Impact:

The substantial impact of biofouling on various aspects, including people, the planet, and profit, motivated respondents to pursue careers in biofouling management. They recognized the importance of sustainable shipping practices and the need to protect the environment while ensuring economic viability.

Interest in Maritime Affairs and Trade:

The attraction towards the maritime industry as a unique and diverse sector, influencing global trade and bringing together people from different backgrounds, motivated some individuals to pursue careers in this field. They expressed a keen interest in maritime affairs and the opportunities for personal and professional growth it offers.

Professional Advancement and Leadership Opportunities:

For a few respondents, the opportunity to work in high-level management positions, flexible working hours, and the potential for career advancement were strong motivating factors.

The motivations for pursuing a career in the maritime/biofouling industry encompassed a range of factors, including a passion for environmental conservation, breaking gender stereotypes, fascination with the maritime sector, addressing emerging topics and regulatory gaps, involvement in research and innovation, love for the ocean, recognition of the socioeconomic impact, interest in maritime affairs and trade, and professional advancement opportunities. These varied motivations reflect the industry's diverse and multi-faceted nature and individuals' commitment to contributing their skills and expertise to the field of biofouling management.

2.3. Gender Disparity in the Biofouling Sector or Related Fields:

The United Nations (UN)² defines *gender disparity* as the differential treatment and exclusion of individuals based on socially constructed gender norms and roles, resulting in unequal access to resources and opportunities. The UN Sustainable Development Goals (SDG - Goal No. 5) prioritize achieving gender equality and empowering all women and girls, highlighting the need to eliminate gender disparities in all aspects of life.

The World Economic Forum (WEF) defines *gender disparity* as the difference between women and men in terms of economic participation and opportunity, educational attainment, political empowerment, and health and survival. The WEF annually publishes the Global Gender Gap Report, which assesses gender-based disparities in countries worldwide. According to its latest report in 2022, the global gender gap has been closed by 68.1%.³ At the current rate of progress, it will take 132 years to reach full parity. This represents a slight four-year improvement compared to the 2021 estimate (136 years to parity). However, it does not compensate for the generational loss which occurred between 2020 and 2021.

Other reputable entities, such as the World Bank, the International Labour Organization (ILO), and various national governments and human rights organizations, also recognize gender disparity as a critical issue. They acknowledge the systemic barriers and discrimination faced by women and girls, leading to unequal access to opportunities, resources, and decision-making power.

Especially within the maritime and biofouling sectors and related fields, gender disparity remains

² Gender Equality: Glossary of Terms and Concepts: <https://www.unicef.org/rosa/media/1761/file/Genderglossarytermsandconcepts.pdf>

³ Global Gender Gap Report, World Economic Forum, 2022: <https://www.weforum.org/reports/global-gender-gap-report-2022/digest>

a hugely prevalent issue. Historically, these industries have been largely male-dominated, with limited representation of women in key roles and decision-making positions. This gender imbalance poses challenges in achieving diversity, equity, and inclusion within the sector. The underrepresentation of women not only limits their career opportunities but also hampers the industry’s overall growth and innovation potential.

Our survey results reveal a significant observation: approximately 61.76% of the respondents acknowledged the existence of gender disparity within biofouling and related fields. This finding emphasizes the pressing need to address the gender imbalance prevalent in these industries.

Acknowledging gender disparity within the sector highlights the importance of promoting diversity and inclusivity. By addressing gender disparities, the industry can tap into a broader talent pool and benefit from a wider range of perspectives and experiences. Gender equality not only fosters a more equitable work environment but also leads to enhanced innovation, productivity, and overall organizational performance.



2.4. Understanding Gender Disparity in the Maritime (Biofouling) Sector:

The insights gathered from survey participants shed light on the gender disparities present in the maritime sector. From limited female representation and unequal opportunities to cultural biases and disparities in conferences and training, these findings highlight the necessity of addressing gender disparity within the industry. By promoting diversity, equal opportunities, and challenging stereotypes, the maritime sector can explore the possibilities of all individuals and nurture a more inclusive and equitable environment.

Limited Female Representation:

In many offices and organizations within the biofouling sector, there is a notable gender imbalance, with more men than women occupying positions. Some respondents highlighted being the only woman in their maritime administration or experiencing a predominantly male-dominated environment. While it may not have directly affected them personally, it underscores the need for greater gender diversity and inclusion.

Unequal Opportunities:

Several participants mentioned that women tend to receive fewer opportunities to attend conferences and workshops, highlighting a disparity in access to professional development resources. Additionally, it was noted that women are often disproportionately represented in start-up companies and the maritime industry as a whole. This underrepresentation can impede women's advancement and limit their networking opportunities.

Gender Pay Gap and Salary Disparity:

The issue of the gender pay gap emerged as a concern among some respondents. They pointed out that disparities exist in both the percentage of women employed and the difference in pay between genders. Addressing these gaps is essential to ensure fair and equitable remuneration for all individuals within the maritime sector.

Challenging Male-Dominated Spaces:

Being a minority in a male-dominated industry can present unique challenges.



Respondents mentioned instances of being the only woman in meetings or teams, which may initially be intimidating. However, it also provides an opportunity to make a lasting impact and challenge biases and stereotypes. Navigating these spaces requires resilience and confidence.

Cultural and Perceptual Barriers:

Cultural perceptions and stereotypes play a role in perpetuating gender disparity within the maritime sector. Some respondents noted that certain roles are seen as more suitable for men due to cultural perspectives, limiting opportunities for women. Overcoming these barriers requires promoting awareness, training, and challenging gender biases.

Unequal Representation in Conferences and Training:

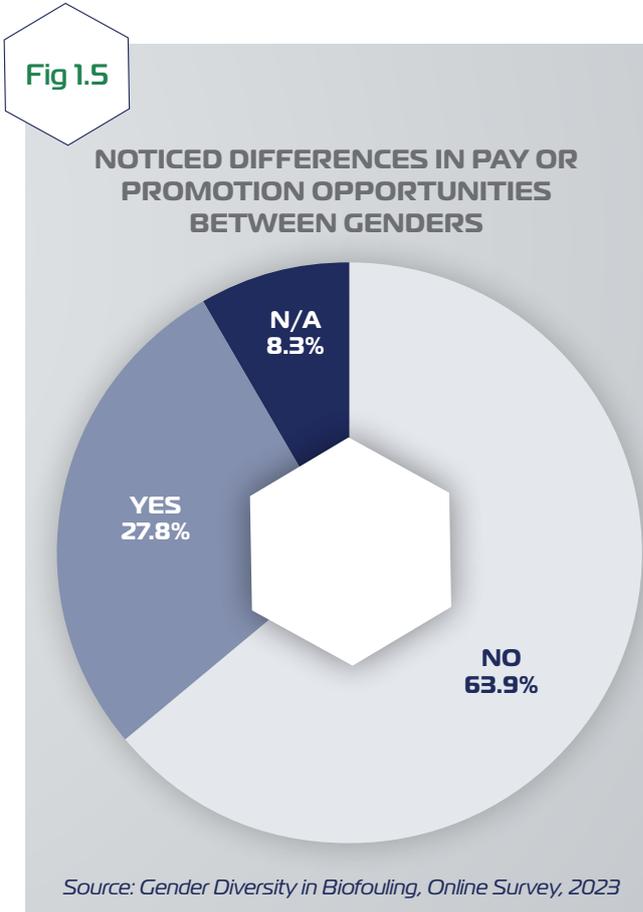
There were accounts of women being underrepresented in conferences and training events within the industry. Some respondents expressed frustration with the preference given to male participants, emphasizing the importance of equal opportunities for women to present and attend such events.

Positive Steps:

Amidst the challenges, several respondents acknowledged the positive aspects of their organizations. They highlighted equal pay opportunities and the presence of gender equality policies in certain countries or organizations. Moreover, many organizations were recognized for their efforts in providing targeted training programs to empower women in their professional journeys. These positive outcomes underscore the importance of cultivating gender equality and inclusivity through policies and practices, demonstrating that progress is being made towards creating a more equitable and diverse maritime and shipping industry.

2.5. Gender Disparity in Pay and Promotion Opportunities: Insights from Survey Participants

The responses from survey participants regarding pay and promotion opportunities in the biofouling sector varied. While some perceived gender-based disparities, others reported equal opportunities and awareness of broader wage gaps. These findings emphasize the importance of fostering transparency and equal opportunity policies to address gender biases within the sector. By promoting fairness and gender equality in pay and promotion practices, the biofouling industry can create an inclusive and supportive environment that drives the motivation for all professionals, regardless of gender.



Perceived Inequality:

Several respondents highlighted perceived differences in pay and promotion opportunities between genders within the biofouling sector. According to some participants, men were often considered more capable of handling marine technical issues, leading to potential disparities in recognition and advancement. This perception reflects gender biases and stereotypes that can hinder women's professional growth.

Equal Opportunities:

On the other hand, several participants mentioned that there were no differences in pay or promotion opportunities based on gender. They highlighted the presence of equal opportunity policies where vacant positions were advertised, encouraging female contenders to apply. These practices aim to create a level playing field and promote gender equality within the industry.

Wage Gap Awareness:

Some respondents acknowledged the existence of wage gaps worldwide, attributing them to biological factors and societal expectations regarding family responsibilities. However, they recognized that such gaps are not unique to the biofouling sector but are prevalent across various fields. These perspectives underscore the need to challenge and address societal norms that contribute to gender-based wage disparities.

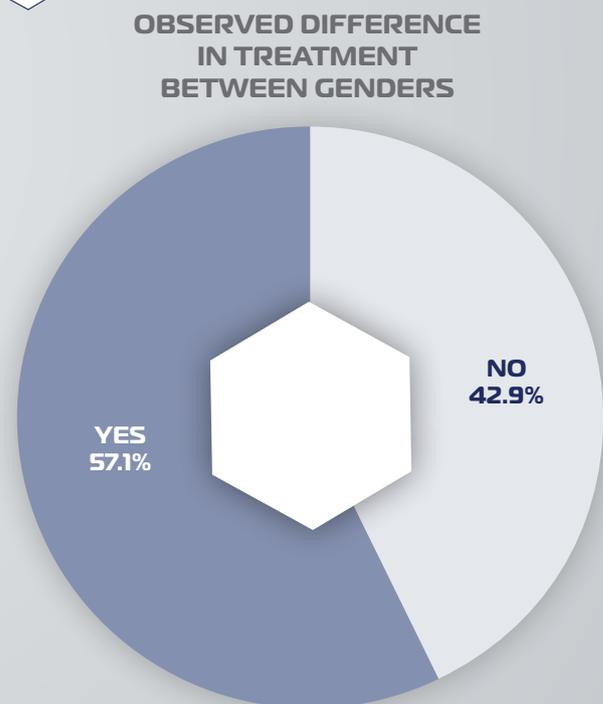
Limited Information:

A few participants indicated that they did not have access to information regarding pay or promotion differences between genders in the biofouling sector. This suggests a need for more transparency or awareness around gender-related disparities, highlighting the importance of gathering and sharing such data to address potential inequalities.

2.6. Gender Disparity in Treatment, Recognition, and Leadership Opportunities:

The responses from survey participants highlight the existence of gender disparities in the treatment, recognition, and leadership opportunities within the biofouling sector. Women often face challenges in being respected, acknowledged, and considered for leadership positions. Cultural norms, lack of awareness, and institutional setups contribute to these disparities. Addressing these issues requires promoting gender diversity, creating awareness, and implementing inclusive policies to ensure equal treatment, recognition, and opportunities for all professionals, irrespective of their gender.

Fig 1.6



Source: Gender Diversity in Biofouling, Online Survey, 2023

Undermined Authority and Lack of Recognition:

Some respondents noted that women in the biofouling sector often face challenges in terms of respect and recognition. They highlighted instances where women’s authority is undermined, leading to a lack of acknowledgment for their contributions. This disparity can be demoralizing and create a sense of inferiority among women professionals.

Male-Dominated Industry:

Participants acknowledged that the maritime industry, including the biofouling sector, is predominantly male-dominated. This imbalance is more pronounced in senior leadership positions, where women are often overlooked, even if they possess the same skills and qualifications as their male counterparts. The lack of consideration for women in leadership roles highlights the need for gender diversity and inclusion within the sector.

Cultural and Awareness Factors:

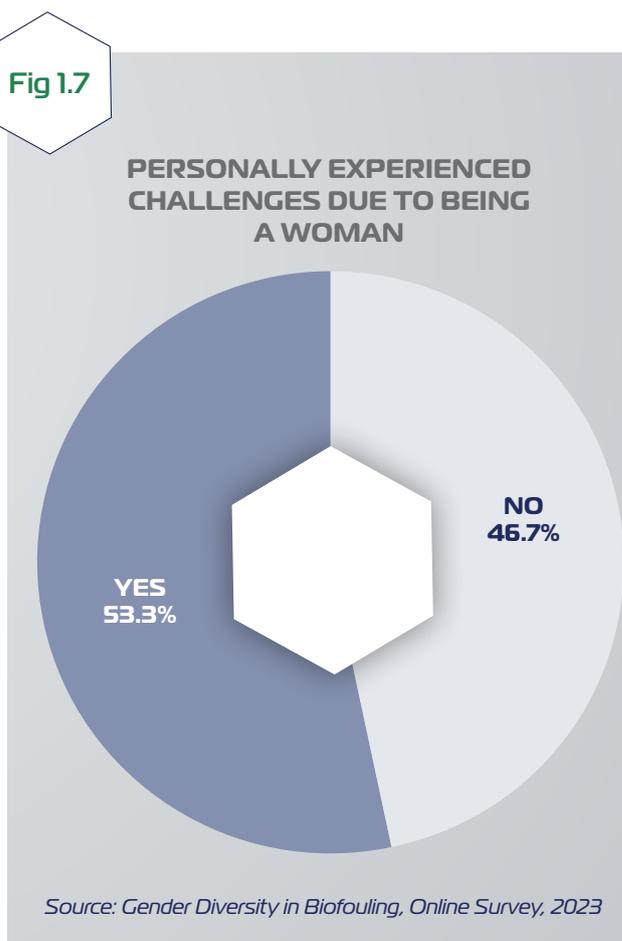
Some respondents attributed the differences in treatment and opportunities to cultural norms, institutional setups, and a lack of awareness. They recognized that gender inequality persists in the workplace, impacting earnings and hindering women’s advancement into leadership positions. Overcoming these challenges requires raising awareness, implementing effective workplace policies, and promoting equal opportunities for all professionals.

Glass Ceiling and Proving Competence:

Survey participants acknowledged the presence of a glass ceiling for women in the biofouling sector. Breaking through this barrier requires women to work harder, be proactive, and constantly push boundaries to prove their competence and deserve equal opportunities. Overcoming these obstacles can be rewarding and pave the way for future generations of women in the industry.

2.7. Challenges and Obstacles Faced by Women in the Biofouling Sector:

The responses from survey participants shed light on the challenges and obstacles faced by women in the biofouling sector and related fields. These challenges include working in a male-dominated environment, limited exposure and unequal distribution of tasks, scepticism and bias, limited training and employment opportunities, and cultural and structural barriers.



Lack of Gender-Neutral Workplaces:

Many respondents highlighted the male-dominated nature of the biofouling sector and related fields.

They mentioned that the language used, such as terminology and job titles, is predominantly male-centric. Additionally, some women expressed difficulties related to personal protective equipment (PPE) designed for men, which can pose challenges in terms of comfort and convenience, especially when using shared facilities like washrooms on board ships.

Exclusion and Limited Exposure:

Several participants shared experiences where they felt excluded from certain tasks or faced unequal distribution of duties. They noted that more responsibilities and opportunities were assigned to their male counterparts, limiting their exposure and undermining their abilities. This disparity in task allocation can delay professional growth and development for women in the sector.

Scepticism and Bias:

Women working in fisheries and aquaculture sectors mentioned encountering scepticism and bias from their male colleagues and counterparts. They had to put in extra effort to gain recognition and establish their professional competence. This included proving their physical capabilities, enduring adverse conditions, and demonstrating their knowledge and skills to overcome the initial doubts and gain acceptance.

Limited Training and Employment Opportunities:

Some respondents reported facing obstacles in accessing training and employment opportunities due to gender. They mentioned instances where training opportunities were denied solely because they were women, and certain shipping companies had policies that did not accept women seafarers. These barriers limited their professional growth and advancement in the sector.

Cultural and Structural Barriers:

Cultural barriers and structural factors were also identified as challenges. Women mentioned facing comments, acts, or stereotypes that were directed towards them, creating an uncomfortable work environment. Structural issues such as limited access to high-level positions, exclusion from meetings, and having their work undervalued or taken credit for by male colleagues were mentioned as further challenges.

Addressing these challenges requires fostering gender equality, promoting inclusive practices, providing equal access to opportunities, and creating a supportive work environment that values and recognizes the contributions of women professionals.



3.0. Coping with and Overcoming Obstacles Faced by Women in the Biofouling Sector:

Despite their obstacles, the participants demonstrated resilience and determination in navigating the gender disparities. They shared various strategies to cope with these challenges, including seeking support from women's associations and networking groups, working harder to prove their abilities, and advocating for awareness and policy changes. These strategies reflect their commitment to breaking through barriers and promoting gender equality within the industry.

Building Support Networks:

Several participants mentioned joining women's associations and networking groups within the maritime industry. They found strength and encouragement through these communities, where women supported and uplifted each other. Building support networks and mentorship programs were considered crucial in empowering women and fostering a sense of solidarity.

Taking Initiative and Seeking Recognition:

Respondents shared their strategies for coping with obstacles, which included working harder than their male colleagues to demonstrate their abilities and knowledge. They focused on delivering exceptional performance, staying calm in challenging situations, and seeking allies to meet deadlines. By showcasing their skills and consistently delivering high-quality work, they aimed to gain recognition and challenge gender biases.

Perseverance and Motivation:

Many women expressed the importance of perseverance and maintaining a positive mindset despite facing obstacles. They emphasized the need to stay motivated and continue working tirelessly towards their goals, even in the face of adversity. By staying determined and committed, they aimed to overcome challenges and prove their capabilities.

Advocacy and Awareness:

Participants highlighted the significance of raising awareness about the obstacles faced by women in the biofouling sector. They suggested implementing awareness campaigns and educating both

men and women about the value and contributions of women in maritime fields. They also emphasized the need for company policies and regulations that support gender equality and provide equal opportunities for women.

Creating Inclusive Work Environments:

To overcome obstacles, participants emphasized the importance of fostering inclusive work environments. This involved normalizing the presence of women in the industry, promoting collaboration and mutual respect between genders, and establishing policies that encourage diversity and gender balance. They emphasized the need to value the role of women and create facilities and support systems that accommodate women's participation in biofouling management and related fields.

3.1. Fostering Inclusivity and Support for Women in the Industry:

Creating an inclusive and supportive industry for women requires a multifaceted approach that addresses various aspects of the working environment. The survey responses offer valuable insights into how the maritime and biofouling sectors can enhance inclusivity and support for women professionals.

Recognition and Promotion:

Based on the survey outcomes, it is evident that acknowledging and celebrating the contributions of women already involved in the maritime and biofouling industry is crucial. By recognizing their expertise and actively promoting their participation in forums, training programs, and relevant projects, we can establish them as role models and inspire other women to pursue successful careers in the field. Highlighting success stories of women professionals serves as a powerful motivation, empowering others to overcome barriers and strive

for excellence. These survey findings provide a compelling basis to believe in and strive towards a future where gender equality and inclusivity thrive in the maritime and biofouling sectors.

Skill-Based Opportunities:

Based on the findings of the survey, it is evident that emphasizing skill sets rather than gender is vital for creating a more inclusive maritime and biofouling industry. The results showed that focusing on talent, irrespective of gender, enables the industry to tap into a broader pool of skills and expertise. This approach also extends to embracing older professionals who may face employment challenges, ensuring that their valuable knowledge and abilities are not overlooked.

Creating an Enabling Environment:

The survey findings emphasize the importance of establishing an inclusive environment encouraging women's entry into the maritime and biofouling industry. Based on these results, it is recommended that leadership actively demonstrate pathways for women's inclusion, remove barriers, and foster a safe and supportive atmosphere. Providing resources, mentorship programs, and spaces for women to showcase their capabilities are vital for facilitating their professional growth and advancement in the industry.

Opportunities for Voice and Concern:

Based on the insights from the survey, nurturing inclusivity in the maritime and biofouling industry requires providing ample opportunities for women to express their concerns, opinions, and ideas. To achieve this, it is recommended that organizations provide platforms such as conferences, workshops, and inclusive decision-making processes. When women's voices are heard and respected, companies can create a more collaborative and diverse work environment.

Promoting Equality and Cultural Change:

According to the survey outcomes, promoting equality, including equal pay, is essential in creating an inclusive industry. Cultural change initiatives should challenge existing biases and create a more level playing field. Encouraging the participation of young professionals and supporting the replacement of outdated practices with fresh perspectives can foster innovation and progress.

Supportive Policies and Benefits:

Implementing policies and benefits that support women, particularly regarding maternal issues, is crucial for an inclusive industry. Responses from the survey show that access to education, monitoring working conditions, and ensuring fair promotion practices can contribute to a more supportive and equitable environment.

With the implementation of these suggestions and committing to ongoing improvements, the maritime and biofouling sectors can actively cultivate an inclusive and supportive industry for women professionals. Embracing diversity and providing equal opportunities will not only benefit individual women but also contribute to the growth and success of the industry as a whole.

3.2. Advice for Women Pursuing a Career in the Biofouling or Related Industry:

Embarking on a career in biofouling or a related industry can be an exciting and rewarding journey for women. The survey responses provided valuable advice for aspiring women professionals, offering insights on navigating the industry and achieving success. Here are some collective recommendations:

Seek Support and Join Associations:

Women interested in pursuing careers in the maritime field are encouraged to seek support and join women's associations. By uniting with like-minded individuals in organizations such as Women's Associations, their voices can be amplified, and they can benefit from the collective support and guidance these associations provide.

Acquire Knowledge and Skills:

Developing a solid understanding of the industry and its regulations is crucial. Investing in maritime-related courses and education equips women with the necessary knowledge and skills to excel in their chosen fields. By continuously learning and staying updated on industry trends, women can enhance their professional capabilities and stay ahead in their careers.

Believe in Yourself and Be Assertive:

Maintaining self-belief and avoiding comparisons with others is essential. Women should strive to do their best, assert themselves, and be prepared to pioneer in a male-dominated industry. By embracing confidence and perseverance, they can overcome challenges and thrive in their chosen career paths.

Embrace Challenges and Opportunities:

Women should be willing to embrace the challenges and opportunities that come their way. The biofouling industry offers a wide range of areas to explore, from

medical and dental to industrial applications and renewable energy. By approaching each task with enthusiasm and a willingness to learn, women can contribute significantly to the field.

Foster Communication and Report Harassment:

Maintaining respectful communication and reporting any instances of harassment or verbal attacks is crucial. Women should encourage open dialogue, promote gender equality programs, and actively participate in seminars and courses that address these issues. Creating a safe and inclusive work environment benefits everyone in the industry.

Network and Seek Mentors:

Building a strong professional network is valuable for career growth. Women should actively seek mentors who can provide guidance, support, and advice based on their own experiences. Identifying mentors and connecting with relevant learning centres can help women navigate the industry and make informed decisions.

Stay Resilient and Never Give Up:

Resilience is key when pursuing a career in biofouling or a related industry. Women should remain focused, responsible, and determined, even in the face of challenges. Believing in oneself and persistently striving for success can lead to fulfilling and rewarding professional journeys.

By following these recommendations, women can pave their way in the biofouling or related industry, contributing to its growth and achieving their career aspirations. With determination, continuous learning, and support from the community, women can excel and make a lasting impact in this dynamic field.

3.3. Key Skills and Traits for Success in the Biofouling Sector and Related Fields:

The biofouling sector and related fields require a range of skills and traits for individuals and women alike to thrive and make a significant impact. The survey responses highlight several important factors necessary for success. Here are the collective skills and traits identified:

Fig 1.8



Technical Expertise and Knowledge:

Having a solid understanding of biofouling management, antifouling paints, and related technical aspects is crucial. Specialized training programs and continuing education can help individuals develop the necessary expertise in these areas.

General and Specific Maritime Knowledge:

Professionals in the field should possess a combination of general and specific knowledge related to the maritime industry. This includes understanding key concepts, regulations, and technologies relevant to biofouling and related fields. The ability to communicate effectively with peers and stakeholders is also essential in establishing a common language within the domain.

Problem-Solving and Project Management Skills:

Success in the biofouling sector often requires strong problem-solving abilities. Professionals should be adept at analyzing complex issues and developing practical solutions. Additionally, project management skills are valuable for overseeing biofouling projects and ensuring their successful implementation.

Confidence and Leadership:

Confidence is an essential trait for individuals in the biofouling sector. Being self-assured in one's abilities and displaying leadership qualities can contribute to professional growth and success. Advocating for gender equality and supporting diversity in the maritime field is also crucial.

Continuous Learning and Adaptability:

The biofouling sector is dynamic and ever-evolving.

Professionals should be willing to continuously learn and stay updated on the latest advancements, regulations, and practices. Being adaptable to new technologies, interdisciplinary approaches, and emerging trends is vital for staying competitive.

Effective Communication:

Strong communication skills are essential in the biofouling sector. Professionals should be able to effectively convey complex information to diverse audiences, including colleagues, clients, and stakeholders. Good communication fosters collaboration, facilitates knowledge sharing, and promotes the importance of the field.

Environmental Awareness and Passion:

A deep passion for environmental protection and an understanding of the impact of biofouling on ecosystems is essential. Professionals should continuously raise awareness about ecological damage and work towards sustainable solutions in all aspects of the field.

Women can enhance their chances of success by cultivating these skills and traits in the biofouling sector and related fields. Through a combination of technical expertise, adaptability, leadership, and effective communication, professionals can contribute to the advancement of the industry while protecting the environment.

3.4. Initiatives and Programs Supporting the Advancement of Women in the Biofouling Industry:

Efforts and initiatives that promote the advancement of women in biofouling and related industry play a crucial role in creating an inclusive and supportive environment. The following collective responses highlighted specific programmes and initiatives aimed at supporting women's progress in the field:

IMO eLearning Biofouling Course:

The International Maritime Organization (IMO) offers an eLearning course focused on biofouling management. This program serves as a starting point for individuals seeking to enhance their knowledge and skills in the field.

Traditional Methods and Regional Practices:

In some regions, traditional methods are employed to prevent biofouling on fishing boats. Women play an important role in the application of herb concoctions during boat building, showcasing their knowledge and expertise.

International Maritime Law Institute Program:

The International Maritime Law Institute (IMLI) offers a program that prioritizes applications from women. This initiative aims to increase the representation of women in the maritime field and provide them with opportunities for growth and development.

IMO's Gender Program and SDG Goal 5:

The IMO's gender program aligns with Sustainable Development Goal 5, which focuses on gender equality. These initiatives work toward promoting gender equality and empowering women in the maritime industry.

National Biofilms Innovation Centre and Other Institutions:

Institutions such as the National Biofilms Innovation Centre and the Florida Institute of Technology contribute to the advancement of women in the biofouling industry through research, training, and support programmes.

Maritime SheEO:

Maritime SheEO is an organization that supports female entrepreneurs and leaders. Although not directly focused on biofouling, its initiatives and resources can inspire and empower women in various fields, including biofouling.

Awareness, Conferences, and Training:

Efforts such as raising awareness, organizing conferences, providing specialized training programs, and offering scholarships can contribute to the advancement of women in the biofouling industry.

Inclusion and Recruitment Criteria:

Initiatives like the In-Country Value (ICV) programme encourage companies to meet gender-balanced recruitment criteria, offering incentives for promoting gender diversity and equality in the hiring process.

Educational Programmes and Teaching Materials:

Advocating for introducing biofouling topics in secondary/high school teaching materials can create early awareness and interest among young women, encouraging them to consider careers in the biofouling industry.

Women can benefit from enhanced educational opportunities, skill development, networking, and increased representation in the biofouling sector by actively supporting these initiatives and programs.

Fig 1.9

INITIATIVES OR PROGRAMS THAT SUPPORT THE ADVANCEMENT OF WOMEN

- 1 IMO eLEARNING BIOFOULING COURSE
- 2 TRADITIONAL METHODS AND REGIONAL PRACTICES
- 3 INTERNATIONAL MARITIME LAW INSTITUTE PROGRAM
- 4 IMO'S GENDER PROGRAM AND SDG GOAL 5
- 5 NATIONAL BIOFILMS INNOVATION CENTRE AND OTHER INSTITUTIONS
- 6 MARITIME SheEO
- 7 AWARENESS, CONFERENCES AND TRAINING
- 8 INCLUSION AND RECRUITMENT CRITERIA
- 9 EDUCATIONAL PROGRAMMES AND TEACHING MATERIALS

Source: Gender Diversity in Biofouling, Online Survey, 2023

3.5. Strategies to Support Women in the Biofouling Industry and Promote Career Progression:

To retrain and attract more women to the biofouling industry and support their career progression, it is essential to create a supportive and inclusive working environment. The following collective suggestions highlight specific strategies and initiatives that can help achieve these goals:

Flexible Working Arrangements:

Implementing flexible working arrangements can enable women to balance their professional and personal responsibilities effectively. Providing options such as flexible hours, remote work,

and job-sharing opportunities can create a more accommodating work environment.

Mentorship Programmes:

Establish mentorship programs that connect women professionals with experienced mentors who can provide guidance, support, and opportunities for growth. Mentorship can help women navigate challenges, build networks, and enhance their career development.

Maternity and Parental Leave:

Offer longer maternity and parental leave to support women in managing their family responsibilities while pursuing their careers. By providing adequate time and support during maternity and parental

leave, women can confidently continue their professional growth.

Gender Equality and Inclusion:

Promote gender equality and create a culture that values diversity within the biofouling industry. Ensure that promotions, raises, and career opportunities are based on merit rather than gender. By fostering an inclusive environment, all professionals can thrive and contribute to the industry's advancement.

Training and Capacity Building:

Offer specialized training programmes that cater to the needs of women in the maritime sector. These programs can provide additional support and resources to enhance their abilities and knowledge in biofouling and related fields.

Facilities and Support:

Provide facilities such as breastfeeding areas for lactating mothers and nurseries in the workplace. These accommodations can help women manage their parental responsibilities while remaining active in their careers.

Awareness and Communication:

Raise awareness about the possibility of having a successful career in biofouling while maintaining a fulfilling family life. Promote success stories and role models to showcase that it is indeed feasible. Effective communication through social media and other platforms can contribute to changing societal perceptions and promoting opportunities for women.

Promote Equal Opportunities:

Ensure equal opportunities for women in terms of job assignments, projects, and leadership positions. By focusing on merit-based selection and removing biases, women can access the same growth opportunities as their male counterparts.

Educational Initiatives:

Introduce educational initiatives that target young girls and women to create awareness and interest in the biofouling industry. These initiatives can include campaigns, workshops, and examples of successful women working in the field, encouraging them to pursue careers in biofouling.

Legislation and Policy:

Advocate for policies and legislation that support work-life balance, family welfare, and gender equality in the maritime sector. By implementing supportive policies, women will feel valued, motivated, and empowered to progress in their careers.

Implementing these strategies and initiatives will help the biofouling industry attract and retain more women professionals, fostering diversity, equality, and career progression. By offering flexible working arrangements, mentorship programmes, and longer maternity and parental leave, women can balance their personal and professional responsibilities. Creating an inclusive environment, providing specialized training, and promoting equal opportunities will further support women's advancement in the field.

4.0. Recommendations to Fill Gaps in Disparities Between Men and Women in the Biofouling Sector

Enhanced Innovation and Problem-Solving:

A key advantage of increasing the number of women in the biofouling sector is their enhanced innovation and problem-solving capabilities. Women's diverse perspectives and experiences contribute to creative and innovative solutions. They foster a broader range of ideas and approaches by bringing unique viewpoints, resulting in a more dynamic and adaptable industry. The inclusion of women in decision-making processes improves the sector's ability to address challenges and find effective solutions.

Improved Work Environment:

Increasing women's representation in the biofouling sector promotes a healthier and more supportive work environment. Women's presence challenges gender stereotypes and promotes equality. This balanced gender representation creates an inclusive and collaborative atmosphere where individuals feel valued and empowered to contribute their skills and expertise. A diverse workforce enhances communication, cooperation, and teamwork, leading to improved morale and job satisfaction among all professionals.

Increased Performance and Efficiency:

Research has shown that companies with higher levels of gender diversity tend to report higher levels of productivity. Women's multitasking abilities and attention to detail contribute to more efficient work processes. By bringing different skills, competencies, and perspectives, diverse teams are better equipped to tackle complex challenges. The collective intelligence and varied approaches of women professionals lead to more effective problem-solving, decision-making, and overall performance in the biofouling sector.

Adaptability and Resilience:

The biofouling sector operates in a rapidly changing environment, requiring adaptability and resilience. Women professionals possess these qualities and demonstrate a strong ability to face

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challenges and manage multiple tasks. Their flexible mindset and capacity to embrace new technologies and methodologies contribute to successful outcomes. By embracing diversity and including more women, the industry benefits from their fresh perspectives and the capacity to adapt to evolving circumstances.

Promotion of Gender Equality:

Increasing the number of women in the biofouling sector promotes gender equality in the maritime industry. It challenges societal norms and creates opportunities for women to excel in traditionally male-dominated fields. Achieving gender balance fosters an environment where all professionals can thrive, regardless of gender. By actively promoting gender equality, the biofouling sector becomes a more inclusive and equitable industry, attracting and retaining talented individuals from diverse backgrounds.

Awareness and Education:

Encouraging women's participation through

targeted campaigns and educational initiatives raises awareness about the biofouling sector. Promoting the industry in schools, universities, and communities creates interest and attracts a diverse talent pool. By highlighting the immense aquatic and biological world at sea, these initiatives inspire women to pursue careers in biofouling research and related fields. By providing opportunities for education, training, and mentorship, the industry can further support the career advancement of women professionals.

Expanding the representation of women in the biofouling sector brings numerous benefits. It enhances innovation and problem-solving, improves the work environment, boosts productivity and efficiency, and promotes adaptability and resilience. Additionally, it fosters gender equality, creating a more inclusive and equitable industry. By raising awareness and providing educational opportunities, the biofouling sector can attract and retain talented women professionals, ensuring its long-term success and sustainability.





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