



**THIRD REGIONAL TASK FORCE MEETING
ON BIOFOULING MANAGEMENT AND INVASIVE AQUATIC SPECIES
Sheraton Surabaya Hotel & Towers, Surabaya, Jawa Timur 60261, Surabaya, Indonesia
20-22 SEPTEMBER 2023**

MEETING REPORT

1. Introduction

1.1 The Third Regional Task Force (RTF) meeting on Biofouling Management and Invasive Aquatic Species was jointly organized by the Government of the Indonesia through the Directorate General of Sea Transportation (DGST), Ministry of Transportation, the International Maritime Organization (IMO) and Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) on September 20-22, 2022 through a hybrid format, i.e., in-person meeting at Sheraton Surabaya Hotel in Surabaya, Indonesia and virtually via Zoom. This meeting is part of the implementation of the GEF-UNDP-IMO GloFouling Partnerships Project (GPP) in the EAS region. Indonesia served as host for the 3rd RTF meeting.

1.2 The Third RTF meeting was a follow through to the 2nd RTF meeting that was convened in November 23-25, 2023, which reviewed the draft Regional Strategy and discussed its implementation including ongoing programs and initiatives of countries and the private sector on biofouling and IAS management. The 3rd RTF meeting aims to endorse and adopt the draft Regional Strategy and Action Plan and discuss the next steps.

1.3 The Meeting was attended by 98 individuals consisting of representatives from 10 EAS countries such as Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Philippines, Thailand, Timor Leste and Vietnam, nongovernment organizations, industry, academe, and private sector, i.e., Global TestNet and Tas Global, Inc., Women in Maritime -Indonesia, IPB, Institut Teknologi Sepuluh Nopember (ITS), Port Authority of Surabaya, Indonesian National Shipowners Association (INSA), Indonesian Port Corporation (Pelindo) and other relevant local organizations in Indonesia, and the International Maritime Organization (IMO) and PEMSEA. You can find the list of participants in **Annex 1** by following this link:

https://docs.google.com/document/d/1YwTDwSWwFyK3llmCCi_YwnCHiFWoo5fl/edit#heading=h.30j0zll

2. Welcome Remarks and Opening Messages

2.1 Dr Hartanto of the Directorate General for Sea Transport of Indonesia, Ministry of Transport, Indonesia, on behalf of the Government of Indonesia, welcomed the participants in the meeting and expressed his appreciation, for the attendance of country delegates at the 3rd RTF meeting and for selecting Indonesia to host the Meeting which is conducted as part of the GPP. Dr Hartanto recalled that the 1st RTF meeting endorsed the establishment of the Regional Task Force and Regional Strategy while the 2nd RTF Meeting reviewed the draft Regional Strategy and discuss its implementation, and countries and private sector initiatives on biofouling management. He further explained that the 3rd RTF Meeting will endorse and approve the Regional Strategy and provide insights into the recommended next steps. He stressed that Indonesia takes responsibility as one of lead partner country of the Glofouling Partnership Project and would be happy to be involved to partner with other countries and organizations in the region to tackle such critical transboundary environmental issue. He stressed that the Project is making a positive impact in global marine environmental protection and expressed Indonesia's commitment to enhance protection of marine environment by combatting biofouling and invasive aquatic species at sea. Dr Hartanto called for active engagement of all parties involved not only in the endorsement of the Regional Strategy but also in the implementation of recommended measures to ensure sustainable and green ocean. He also expressed appreciation to IMO and PEMSEA for continuous support for Indonesia and other states involved in the Project in implementing the IMO Biofouling Guidelines and the first countries to gain best practices in biofouling management to achieve sustainable development goals in 2030. Dr Hartanto further expressed his appreciation for every effort in addressing this environmental challenge to bring sustainability to the marine environment and create green oceans for future generations.

2.2 Dr Hoang, Deputy Administrator of Vietnam Maritime Administration (VINAMARINE) and Chair of ASEAN Maritime Transport Working Group (MTWG) delivered his message via the Zoom meeting platform.

Dr Hoang extended gratitude to the organizers for inviting him in his capacity as Chair of ASEAN MTWG to the 3rd RTF meeting. He emphasized that the MTWG implements and coordinate activities in the maritime sector and indicated that ASEAN member states are well aware of the importance of preservation and protection of marine environment. Further, he explained that ASEAN has many projects related to marine environment protection carried out in previous years such as MEPSEAS, Rethinking Plastics etc. He stressed that the world is facing marine pollution, climate change and biodiversity loss recently, thus, it is necessary to be well equipped with proper knowledge and the necessary capacity to address the problem. Dr Hoang is pleased to know that biofouling project provide guidance to countries in establishing the Regional Strategy and assist ASEAN countries in building capacity and mobilizing resources for implementing actions for effective biofouling management including having experts and representative in the region and IMO and the maritime industry to share their expertise to make the meeting a successful one. Dr Hoang underscored that biofouling management can be brought into discussion at the 45th MTWG meeting in Vietnam in October this year.

2.3 Dr Lilia Khodjet El Khil, Project Manager of the IMO Glofouling Partnership Project started her message by introducing the IMO delegation consisting of Ms. Josephine Uranza, Regional Coordinator for East Asia and Ms. Ernesta Swanepoel, International Expert of IMO on Policy. Dr Khodjet El Khil appraised the delegates on what is happening at the global level and stressed that IMO revised its Biofouling Guidelines adopted in 2011, which she

considered a good step forward to make the regulatory framework more robust to tackle the issue. She discussed the objectives of the GPP, namely: 1) to promote the IMO guidelines and best management practices on Biofouling Management and 2) to tackle the issue of invasive aquatic species introduced via shipping. She also explained how the Project is implemented in the region as follows:

- PEMSEA has partnered with IMO as Regional Coordinating Partner and supports both regional and national efforts in minimizing the introduction of invasive aquatic species via ships by biofouling.
- The Lead Partnering Countries (LPC)- Indonesia and Philippines is leading the way in the region in biofouling management and commended their efforts at national and at the regional level by hosting the RTF meetings.
- Partnering Countries such as Malaysia and China are countries who expressed interest in addressing the issue but does not benefit from the Project.

She highlighted the achievements of the project in raising awareness about the issue considering that it is not very well known despite its impact globally and regionally and in developing the Regional Strategy and Action Plan which will prevent conflicting approaches in addressing the issue, promote cooperation and common understanding on what to do with impacts of biofouling at regional level.

Dr. Khodjet El Khil underlined the next steps where she hopes that the Regional Strategy and Action Plan be adopted formally and to be implemented since a lot of effort, time and money has been spent to support the development of the Strategy and reiterated her call for its adoption and implementation and to put it forward to the ASEAN Maritime Transport Working Group. She expressed her appreciation to the delegates for their attendance at the 3rd RTF Meeting.

2.4 Ms. Aimee Gonzales, PEMSEA Executive Director conveyed her appreciation to the Government of Indonesia through the Directorate General of Sea Transportation, Ministry of Transportation led by Dr Hartanto, for co-hosting the 3rd Regional Task Force Meeting on biofouling management along with the IMO GPP. She also acknowledged the presence of the ASEAN Chair of the Maritime Transport Working Group and Deputy Administrator of Vietnam Maritime Administration, Mr. Hoang for gracing the meeting. She emphasized the importance of securing approval of the Regional Strategy from the ASEAN since it is the highest political decision-making body and would enable countries to implement their projects at the local, national, and regional level smoothly. She indicated that PEMSEA intends to finalize the Regional Action Plan on Biofouling Management and submit it to IMO for consideration for any next phase of GPP as well as to other donors. Ms Gonzales stressed that having RTF members in the ASEAN MTWG will also help secure champions for the adoption of the Regional Strategy in the ASEAN. She indicated that since 2019 several regional awareness-raising seminars and learning exchanges on the topic were organized bringing both regional and global experts to government and non-government stakeholders in the region. She narrated the process in developing the Regional Strategy which started with establishment of the RTF in 2021, review of the draft in 2022 and a collective endorsement in 2023. She stressed that apart from the Regional Strategy countries like Indonesia and the Philippines are starting to develop their National Strategy and Action Plans which are also aligned with the draft Regional Strategy which is a dynamic framework that

encompasses many themes and geographically covers not only the ASEAN region because invasive aquatic species is a transboundary issue, to be revisited every three to four years to ensure that it is fit for purpose and implemented effectively. The Regional Strategy is also aimed to contribute and align to global targets specifically with the triple planetary crisis of biodiversity, climate change and pollution and help transition towards sustainable, inclusive, and resilient blue economies.

3.0 Presentation and Adoption of the Meeting Agenda

3.1 Dr Hartanto, Directorate General for Sea Transportation of Indonesia chaired the 3rd Regional Task Force meeting and presented the agenda for adoption. The meeting adopted the agenda as presented and given in **Annex 2**; please see the link below:

<https://docs.google.com/document/d/1WPtqeoGSPLAEIpOndf92mrr6K2Yjwwbi/edit>

3.2 After the adoption of the agenda, Dr Hartanto facilitated the introduction of in-person and virtual participants, which included representatives from RTF member countries, i.e., Brunei Darussalam, Cambodia, Indonesia, Japan, Lao PDR, Malaysia, Philippines, Thailand, Timor Leste and Vietnam; nongovernment, industry, academe, and private sector, i.e., Global TestNet and Tas Global, Inc., Women in Maritime -Indonesia, IPB, Institut Teknologi Sepuluh Nopember (ITS), Port Authority of Surabaya, Indonesian National Shipowners Association(INSA), Indonesian Port Corporation(Pelindo) and other relevant local organizations in Indonesia, the International Maritime Organization (IMO) and PEMSEA.

4.0. Highlights of the Meeting

4.1 Status of UNDP/GEF/IMO GloFouling Partnerships Project' on Biofouling Strategy Development and Other Related Global Developments on Biofouling (by Dr Lilia Khodjet El Khil, Project Manager of UNDP/GEF/IMO GloFouling Partnerships Project)

4.1.1 Dr Khodjet El Khil provided an overview of the GPP, which aims to assist developing countries in implementing the IMO Biofouling Guidelines and minimize the introduction of IAS and presented a comprehensive update on the developments of the Project, specifically on the development of biofouling management guidelines and strategies at the global, regional, and national level. Updates on IMO's initiatives on Biofouling Management were presented specifically on the revision of the IMO Biofouling Management Guidelines developed in 2011 to make the text more solid to facilitate implementation. The revised guidelines will include the Guidance for In Water Cleaning to be completed in 2025. Having revised guidelines still does not make it mandatory but there is a call to make Biofouling Guidelines a mandatory Convention.

4.1.2 She emphasized that the devastating impact of IAS on the marine environment, economy, resources, and human health is increasingly recognized globally. Hence, the

issue of biofouling and IAS is now high on the international agenda as indicated in the following:

- The IPBES report on Global Assessment on Biodiversity and Ecosystem Services made an assessment on the status of biodiversity globally and recognized IAS as one of the 5 most important direct drivers for biodiversity loss.
- The Kunming Montreal Global Biodiversity Framework has now included targets specific to invasive aquatic species (IAS) to reverse the decline in biodiversity.

4.1.3 Under the GPP Project, the three-tier model for implementation- global, regional and national activities were discussed which includes developing guides and training course packages at IMO level, regional partners support the development of regional strategy and at national level lead partnering countries have deliverables under the project. Lead partnering countries build their own national capacities and showcase what they are doing, lead the way in their respective regions. Partnering countries (Malaysia and China) do not benefit from the Project directly but will be able to benefit under the TEST Biofouling Project to undertake national training. Several activities will be implemented under the TEST Biofouling Project funded by the Government of Norway.

4.1.4 Dr Khodjet El Khil informed the participants of the available publications, resources and reports related to Biofouling Management which can be accessed at the IMO website (<https://www.glofouling.imo.org/>). She also mentioned the newly launched eLearning training course, developed by the Project and available on the IMO Learning platform, open to anyone willing to take the course. Training courses will also be delivered under the TEST Biofouling Project. Guides are used by 12 countries to develop national reports and strategies. Various technical reports were also developed on best management practices – in Aquaculture and Recreational boating; on regulations and standards; and on the relationship between biofouling management, fuel efficiency and GHG emission.

4.1.5 At the national level, lead partnering countries are at different stages in the establishment of national task force, completion of the national status assessment, completion of the national economic assessment, development of the national strategy and action plan on biofouling management and communication and awareness raising. At the regional level, established RTF in all regions and have developed the Regional Strategy. The importance for countries to endorse, adopt, and implement the Regional Strategy and Action Plan on Biofouling Management in the East Asian Region was emphasized because biofouling management supports the blue economy.

4.1.6 For the next steps (2024-2025) – approaching the end of the project, lead partnering countries to complete the national economic assessment, and to complete and adopt national strategies and action plan, host/attend 2 training courses (2024). At the regional level –to complete, adopt and start implementing the regional strategies and action plan. Project Team will have more reports issues and 2 training courses developed and organization of the 3rd R&D Forum in Busan and continue supporting Global Industry Alliance activities.

4.1.7 Comments and recommendations were raised after the presentation as follows:

- Conduct of conference on biofouling for scientific community between IMO and RINA or IMAREST (who are strategic partners of the Project) possibly in hybrid or online.
- More information on TEST Biofouling –a sister project to Glofouling Partnerships Project funded by the Government of Norway; demonstrate more on technology and will provide support to partnering countries.

4.2 Development of the Regional Strategies in all Regions (by Ernesta Swanepoel, IMO International Consultant)

4.2.1 Ms. Swanepoel, IMO Consultant provided an update on the status of development of the regional strategies in 5 regions covered under the Glofouling Partnerships Project such as PERSGA, SACEP, PEMSEA, CPPS and SPREP. It was emphasized that the regions are at different stages- from the drafting of regional strategies up to the implementation of regional action plans. Various activities at the regional level were undertaken such as regional workshops, development of regional strategy template and several RTF meetings. The status of activities in each region area as follows:

- PEMSEA made tremendous progress in drafting the regional strategy and is currently in the process of endorsing and adopting it.
- PERSGA – established an RTF, in the process of drafting the regional strategy and no final strategy yet.
- SACEP - had first regional meeting in 2022, some work commenced but only 3 countries present,
- CPPS – a lot of movement and already have a regional strategy on invasive species in place and incorporated biofouling in the existing strategy; already implementing some actions in the regional action plan.
- SPREP – had first RTF meeting in Fiji in 2023 commenced work on draft regional strategy and agreed on vision, mission and objectives.

4.2.2 It was concluded that most regions made significant progress towards drafting and adopting a Regional Strategy and Action Plan in their respective regions and the Project was able to facilitate the development of a holistic strategy and action plan either in draft form or in the stage of adoption stage. This will also prepare countries towards a mandatory system when it happens. A call for endorsement of the regional strategy was expressed.

4.2.3 Questions and recommendations

1. If studies or lessons learned conducted in other regions can be shared?
This is done under the knowledge sharing platform of IMO; can take place in global and regional task force meetings; report will be produced putting all developed in various regions where information on what is happening on biofouling but more focused on policy.

4.3 Regional Strategy and Action Plan (by Dr Won Tae Shin, PEMSEA)

4.3.1 **Dr Won Tae Shin, PEMSEA** presented the final draft of the Regional Strategy and Action Plan. The process and timeline in the development of the Regional Strategy and Action Plan was explained as follows:

- Zero draft circulated (April 2022)
- Zero draft reviewed during the 1st RTF Meeting (April 2022)
- 1st draft reviewed by the 2nd RTF meeting (November 2022)
- 1st draft circulated (July 2022)
- 1st draft reviewed during the PEMSEA Executive Committee Meeting
- Final draft circulated for review (December 2022)
- Regional Action Plan developed (2023)

4.3.2 The vision, mission, strategic objectives, and strategic actions of the Regional Strategy was discussed underlining the need to harmonize biofouling management practices in the EAS region to maintain healthy marine ecosystems free from disruption of invasive aquatic species and to promote energy efficient operation of ships.

4.3.3 Questions, Comments and Recommendations

1. In Thailand there is an existing interagency committee mechanism- the Maritime Transportation Working Group under APEC, can this mechanism be utilized as the interagency governance mechanism for biofouling? In countries with existing working groups or maritime bodies working on policies, biofouling issues can be incorporated using existing policy platforms to mainstream biofouling issue.
2. Can PEMSEA include EAS countries in the project proposal for GEF funding?
PEMSEA will initiate consultations with countries in developing project proposal(s).

4.3.4 Following the presentation, countries unanimously endorsed the final draft of the Regional Strategy and Action Plan. Below are the highlights of the country statements:

1. **BRUNEI - Mr. Mohammad Yaakup Saidi**, Manager, Regional and International Maritime Affairs, Maritime Port Authority emphasized that the initiative is crucial in preserving the marine environment, the importance of the strategy and legislation must be put in place to have a comprehensive and effective approach in biofouling management in the region. Ready to collaborate with member states to address challenges caused by biofouling and its effect on fisheries marine ecosystem.
2. **CAMBODIA – Ms. Sorachana Theng**, Deputy Director of Merchant Marine Department stressed that they agree with the final draft and expressed the need for assistance and support to EAS countries from the Regional Coordinating Partner in developing the national strategy.
3. **INDONESIA – Mr Miftakhul Hadi**, Deputy Director of Marine Pollution Prevention and Ship Safety Management and Environment Protection of DGST stated that Indonesia is preparing national economic assessment and national strategy and action plan according to the Regional Strategy, express strongest support for the Regional Strategy to facilitate implementation of national strategy.

4. JAPAN – **Mr Shinnosuke HADA**, Ocean Development and Environment Policy Division, Maritime Bureau of the Ministry of Land, Infrastructure, Transportation and Tourism, supports the endorsement of the Regional Strategy for advancing technical development in biofouling management in Japan. Japan anticipates the opportunity to facilitate the exchange of technology-related information among ASEAN and PEMSEA member states.
5. LAO PDR – **Mr, Somvang Bouttavong**, Division Director, Department of Water Resources endorsed the regional strategy on biofouling management
6. MALAYSIA – **Mr. Maurice Juliee**, Deputy Director for Operations, Marine Department of the Ministry of Transport stated that the alignment of the Regional Strategy with international guidelines and best practices is commendable, Malaysia in principle agrees to the strategic objective and plan outlined in the Regional Strategy and supports its implementation in the region within respective capacity.
7. PHILIPPINES – **Ms Sonia Malaluan**, Deputy Administrator of the Maritime Industry Authority emphasized that the Regional Strategy serves as an instrument to collectively address and manage biofouling; assist the countries in creating respective national policies to minimize biofouling; agree to the draft Regional Strategy and Action Plan and commit to support and push for the approval of the Strategy in various ASEAN mechanism such as the ASEAN MTWG. The Philippines will continue to support IMO and PEMSEA and collaborate with other member states of IMO and ASEAN to manage biofouling; committed to adopt a national strategy and action plan and conduct capacity building and awareness building on biofouling.
8. THAILAND – **Mr. _Decha Chotepanitses**, Engineer Professional Level, Ship Standard Bureau, Marine Department stressed that they agree with the draft Regional Strategy and indicated proposed changes on specific activities under the action plan specifically on developing the national biofouling management strategy and action plans, conduct of regional and national studies on baseline assessment, establishment of data center. and assistance to develop funding request.
9. TIMOR LESTE – **Mr Helder Pascoela Maria da Silva**, Technical Officer, Ministry of Transportation and Communication, indicated their strong commitment to securing and protecting the marine environment and to protecting and preventing the spread of biofouling in ships and port infrastructure. The Regional Strategy is important to Timor Leste, indicated the need for experts to support in the development of regulation on biofouling management recognizing limited resources in the country.
10. VIETNAM – **Ms. Thi Thanh Huyen**, Deputy Director of the International Cooperation and IMO Department, Vietnam Maritime Administration, underscored their concern with protecting the marine environment and participated in various conventions; she indicated that it is difficult to implement the regional strategy due to lack of studies but will report to leaders in VINAMARINE to consider in studying and implementing some activities such as investigating status of biofouling management in Vietnam, experience sharing from Indonesia and Philippines on implementation matters and documents. Draft Regional Strategy is clear and recommend consulting and seeking approval from ASEAN MTWG for discussion and consideration.

4.3.5 In summary, the countries endorsed the regional strategy on biofouling management and emphasized the following actions and next steps.

1. Technical assistance on the conduct of baseline studies on the extent of IAS and on biofouling management.
2. Assistance in developing the national strategy and action plan on biofouling management by countries.
3. Experience sharing by lead partnering countries to other EAS countries.
4. Countries develop and implement national strategies and action plans within their capacity and resources of countries.
5. Promote collaboration among various member states in the implementation of the Regional Strategy and Action Plan.
6. Endorse the Regional Strategy and Action Plan to the ASEAN mechanism through the ASEAN Maritime Transport Working Group which is meeting 16-17 October in Ho Chi Minh, Vietnam.

Country statements are attached as **Annex 3**. Please see the link below.

https://drive.google.com/drive/folders/1DPk81e8m9xb2RWojZB_EQ2cl42GpHI-2

4.4 ASEAN MT Working Group Process of Endorsement (Ms Josephine Uranza, IMO Regional Presence Office for Asia and Pacific)

4.4.1 **Ms Josephine Uranza**, IMO Regional Coordinator for Asia Pacific Regional Presence Office informed the Meeting on the discussion of biofouling at the ASEAN MT Working Group. She indicated that the Philippines presented the Draft Regional Strategy during the previous ASEAN MTWG meeting.

4.4.2 The 3rd RTF Meeting recommended that:

- The Philippines communicates with the ASEAN Secretariat to include in the ASEAN MTWG agenda a discussion on the Regional Strategy and Action Plan on Biofouling Management.
- Indonesia to present the results of the 3rd RTF Meeting and the Regional Strategy and Action Plan in the next ASEAN MTWG Meeting in October.

4.5 Updates from Lead Partnering Countries

4.5.1 Updates from Philippines

Engr. Ramon Hernandez, Director Shipyards Regulation Service of the Philippine Maritime Industry Authority presented progress of activities under the Project as follows:

- The existing interagency coordinating mechanism (ICCRIMC) is utilized as the national task force for the Biofouling project.
- National status assessment report completed.
- National rapid economic assessment is ongoing.
- National strategy and action plan ongoing.

Other initiatives of the Philippines were also presented to promote a holistic approach in the implementation of various IMO environmental regulations such as the creation of a

Marine Environment Protection Service in MARINA dedicated to oversee the implementation of MEP and Energy Efficiency policies and standards and updating and implementation of the Maritime Industry Development Plan (MIDP) specifically the program on Promoting an Environmentally Sustainable Maritime Industry which incorporates the program on biofouling.

4.5.2 Updates from the Indonesia

Dr. Mochammad Riyanto, a national consultant from IPB University, spoke about the findings of the Rapid Economic Assessment of Biofouling Management in Indonesia and gave a brief overview of the national industries (Shipping, Ports, Aquaculture, Fisheries, Offshore Mining, Recreational Boating) that may be affected by invasive aquatic species, highlighting the potential effects of biofouling and IAS on these industries (with and without policy) and providing an estimate of the value of the affected sectors. Cost projections for Indonesia's development management initiatives were provided. The management of biofouling in Indonesia, according to Dr. Riyanto, necessitates the cooperation of all pertinent stakeholders, including a number of Indonesian ministries and institutions.

4.5.3 Women and Maritime Initiatives in Environmental Preservation

Ms. Dothy ST, Engineering Director of PT Pelindo Terminal Petikemas, Indonesia, presented several initiatives and activities of WIMA Indonesia regarding environmental preservation, including mangrove planting, coastal clean-up, coral reef planting, conservation and monitoring, turtle release, and waste management - promoting reduction of waste accumulation through donation of waste shredding machine and waste sifting and Environment Day podcast that offers helpful advice for protecting the environment.

5.0 Biofouling -Related Research and Innovative Initiatives in Indonesia

The second day of the Third RTF Meeting focused on Indonesia's effort on Biofouling- Related and Innovative Initiatives. Below are highlights of the presentations:

5.1 The Effect of Biofouling on Ships Performance by Prof. Ketut Aria Pria, ITS Surabaya

Prof. Ketut outlined how ITS and Melbourne's Southampton University collaborated on the study project. He emphasized that there is a common belief, particularly among naval architects and engineers, that roughness on an underwater hull, such as that caused by biofouling growth, can actually increase ship drag and reduce speed because the engine is forced to maintain speed. It can also result in increased emissions of toxic gases into the atmosphere, particularly CO₂, which is responsible for the rise in temperature.

Prof. Ketut went on to describe their experiment on two vessels, which involved measuring the growth of biofouling and correlating it with how it affected the vessel's drag. According to the research conducted, biofouling increased ship resistance, power requirements, fuel consumption, and harmful gas emissions. The roughness scales of biofouling (height, pitch, density, etc.) are extremely varied. By using an in-situ experiment, a laboratory experiment, a numerical simulation, or a combination of the three methods, the predictions can be determined with accuracy.

5.2 Regulatory Framework for the Protection of Indonesia's Marine Environment from Alien Invasive Species Threats

Dr Nilam Andalia Kurniasari, Center for Maritime and Ocean Law Studies, Faculty of Law

Dr Nilam discussed their future research, which is a follow up research on BWM Convention in 2018, triggered by the release of the 2023 IMO guidelines on Biofouling. She explained the threats caused by IAS to the marine environment, human health and its negative economic impact. The international regulatory framework for the prevention of transfer of IAS was also discussed including UNCLOS, BWM Convention and AFS convention. She emphasized the specific provisions of each convention which can be used to tackle or prevent the spread of IAS to the marine environment. Indonesia ratified the mentioned conventions through the issuance of a Presidential decree. Law no. 17 of 1985 ratified UNCLOS, Presidential Decree 66 of 2014 ratified AFS and Presidential Decree 132 of 2015 ratified BWM. Marine environment protection and preservation can be found in various national regulations Regulation can be found in various national regulations. Dr Nilam believed that Indonesia needs enactment of national regulation on IAS transfer.

5.3 Unlocking the Biofilm Matrix Exploring a Nutrient Rich Micro-habitat As A Pioneer in Biofouling Formation

Dr Andi Kurniawan, Faculty of Fisheries and Marine Science, University of Brawijaya

Dr Andi stressed that most technology to address biofouling focused on anti-fouling. Hence, their study focused on the biofilm method as an alternative approach in preventing biofouling. He concluded that understanding biofilm may be considered as another approach in preventing biofouling.

5.4 Port Biological Baseline Studies Across Indonesia for Monitoring Invasive Aquatic Species and Risk Assessment

Dea Fauzia Lestari, Faculty of Fisheries and Marine Sciences, IPB University

Ms Dea indicated that the initiative is a collaboration between IPB and DGST. The study is focused on settlement and recruitment of biofouling in 2 different habitat -harbor and reef site and concluded that port area has warmer temperature, and the nutrient content can support the settlement and recruitment of biofouling in port area.

Another study between IPB with Germany observed biofouling in vessels and found that green mussels that attach on vessel hull found in Ambon not a natural distribution of mussel, the origin is from western part of Indonesia. The two studies highlight that port is a potential area for spreading of introduced species.

Ms Dea also discussed the port biological baseline studies conducted in Indonesia in 2019, 2021 and 2023. A total of 19 ports have been monitored and surveyed - 6 ports in 2019, 8 ports in 2021 and 5 ports in 2023 in eastern part of Indonesia. The method used refers to IMO Guidance on PBBS 2014. The method used for the conduct of PBBS in 2019 is the conventional method, and for 2021 and 2023 used e-DNA and bar coding.

Recommended next steps include to undertake comprehensive analysis for primary and secondary data, establish data center or portal for marine biodiversity and biophysics and data to be connected to regional or global data, and to develop citizen science for monitoring and reporting.

6.0 Recent Developments and Initiatives by Business and Other stakeholders

Global Test Net (Dr Guillaume Drillet, Director and Chair of the Global TestNet)

Dr Drillet presented an introduction of Global Test Net including its commitment to help countries related to biofouling. The network through sharing information during meetings, working together to propose robust procedures and processes to manage risks. He indicated that Global TestNet is a strategic partner in the Globallast Project as a testing organization in ballast water treatment system. It also supports Glofouling Project and has a consultative status in IMO in terms of technical information. Dr Drillet stressed that Global Test Net has the largest network of laboratories, committed to the same objectives of sharing best practices and developing standards. He explained how the Global TestNet can help the RTF by comparing their 2023-2025 strategy with the Regional Strategy. Some initiatives that they have done include submitting a proposal to IMO for developing guidelines for verification of in-water cleaning systems. Examples of activities undertaken in the region are 1) Testing for presence of Invasive Marine species in Bintan, 2) Testing the efficacy of antifouling coatings in Singapore, 3) Biofouling field test in Indonesia, 4) Testing microplastics released from paints, etc. The overall capability of the network was also discussed.

6.1 TAS Global ((Sophia) Hee Jung Kim, Director of Tas Globa)

Ms Sophia, CEO of TAS Global shared that the Korean Ministry of Oceans and Ministries finance R&D initiatives and TAS Global is the only private company to do an exhibition during the 2023 Korean Maritime Week and Ministerial Forum and does governmental policy promotion. She shared the KBioFouling initiatives which aims to equip developing countries with GloFouling solutions using ODA funds. The components of the KBioFouling include the application of the most efficient in water cleaning (IWC) robot, capturing technology, water treatment, and the application of artificial intelligence for prewarning for biofouling, hull performance and GHG monitoring. He also discussed the emerging needs of the shipping industry for IWC and the future developments for the IWC technology including a fully autonomous and an integrated IWC system.

6.2 Introducing Blustreak; Indonesia's Innovative Underwater Cleaning ROV Service

Brian Wibisono Surya, Chief Executive Officer

PT. Blustreak Marindo Nusantara

Mr Surya provided an introduction of the company and indicated that it is newly established in March 2023, specializing on ROV-based underwater cleaning of marine vessels, pioneer in Indonesia providing underwater robotic hull care for marine vessels. The company has background as shipowner and operator. He provided the specification and capability of the ROV developed by the company, which is equipped with advanced cleaning tools and cameras, remotely controlled from the surface, allowing precise cleaning and real-time monitoring. ROVs are designed for efficiency, safety, and minimal environmental impact. Also equipped with debris collection internally and when required external debris collection and filtration system. Mr Surya stressed the benefits of clean hulls to ship owners, financial and social benefits to various stakeholders.

Copies of the PowerPoint Presentations are attached as Annex 4 and can be accessed in the link below.

Day 1 - <https://drive.google.com/drive/folders/17Ff5biR7dEs9d92HHM-kXL8xJc06sPsi>

Day 2 - <https://drive.google.com/drive/folders/1jjpEdxCdiUgRliXIEqE5ZBNA945D-Jdp>