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Coordinating Body on the Seas of East Asia (COBSEA)

Part One of the Twenty-fifth Intergovernmental Meeting of the Coordinating Body on the Seas of East Asia (COBSEA)
Virtual Meeting, 8-9 September 2021

Report of part one of the Twenty-fifth Intergovernmental Meeting of the Coordinating Body on the Seas of East Asia

1 AGENDA ITEM 1: OPENING OF THE MEETING

1.1 Welcome address and opening remarks

1. Mr. Mahesh Pradhan, interim Coordinator of the Coordinating Body on the Seas of East Asia (COBSEA), welcomed delegates to the Meeting and expressed appreciation for the active engagement with countries in preparation of the first part of the Twenty-fifth Intergovernmental Meeting (IGM 25). Mr. Pradhan elaborated that, following consultations with all COBSEA participating countries, and considering the current COVID-19 challenges, it had been unanimously agreed to convene IGM 25 in two parts, drawing upon modalities used by the Fifth Session of the United Nations Environment Assembly (UNEA-5). Consequently, the first part of IGM 25 was convened virtually on 8-9 September 2021 to address priority issues for decision-making, while part 2 would be organized in-person in Viet Nam as soon as possible in 2022.

2. Ms. Susan Gardner, Director of Ecosystems Division, United Nations Environment Programme (UNEP), delivered opening remarks on behalf of the Executive Director of UNEP. She highlighted the close link between prosperity and the coastal and marine environment as well as the importance of COBSEA, its Strategic Directions 2018--2022, and the COBSEA Regional Action Plan on Marine Litter (RAP MALI), for concerted action in the region. She concluded by reemphasizing UNEP's commitment to regional collaboration, with Regional Seas programmes as key implementation platforms.

3. Ms. Isabelle Louis, Deputy Regional Director for the UNEP Regional Office for Asia and the Pacific, delivered her opening remarks. She thanked all participants who joined the Meeting and congratulated COBSEA for organizing the Meeting during the COVID-19 pandemic. She reiterated the emphasis that the Fifth Session of UNEA had placed on addressing the triple planetary crisis of climate change, pollution, and loss of nature and commended the timeliness of IGM 25 to tackle economic and social challenges. She stressed that thought leadership from COBSEA participating countries contributed valuable experiences to current regional and global platforms to realize national needs and priorities, and mentioned important events for the region, such as the recent Ministerial Conference on Marine Litter and Plastic Pollution co-convened by the Government of Viet Nam. She concluded by assuring the continued support of the UNEP Regional Office to COBSEA countries, including in the implementation of the COBSEA RAP MALI.

4. Mr. Nguyen Que Lam, Deputy Director General, Viet Nam Administration of Seas and Islands (VASI) of the Ministry of Natural Resources and Environment of Viet Nam, delivered opening remarks on behalf of the host country of IGM 25. He thanked all participants for attending the Meeting and expressed Viet Nam's commitment to COBSEA and the prevention of plastic pollution and marine litter, encouraging all participating countries to join to do the same. Mr. Lam suggested the promotion of scientific research to address plastic pollution and expressed his hopes that the IGM 25 would contribute to the achievement of this end.

1.2 Introduction of participants and acknowledgement of credentials

5. Heads of delegations were invited to briefly introduce their delegations to the Meeting in alphabetical order. The list of participants is attached as Annex 1 to this report.

6. COBSEA Secretariat acknowledged the receipt of credentials of representatives of countries participating in the first part of the Twenty-fifth Intergovernmental Meeting of the Coordinating Body on the Seas of East Asia, in accordance with Rule 17 of the Rules of Procedure of the United Nations Environment Assembly of UNEP.

7. As of 13.00 ICT (UTC +7) on 8 September 2021, the representatives of the nine COBSEA participating countries were in attendance. The credentials issued by or on behalf of the Head of State or Government, the Minister of Foreign Affairs or Minister of Environment, had been received electronically for the representatives of the following nine participating countries: Cambodia, People's Republic of China, Indonesia, Republic of Korea, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam.

2 AGENDA ITEM 2: ORGANIZATION OF THE MEETING

2.1 Designation of Officers

8. In accordance with the Rules of Procedure of the United Nations Environment Assembly of UNEP, applicable *mutatis mutandis* to this Meeting, the participating countries were invited to elect a Chairperson, a Vice-Chairperson, and a Rapporteur.

9. The Meeting agreed to elect the following officers:

Chair: Mr. Nguyen Que Lam, Deputy Director General, Viet Nam Administration of Seas and Islands (VASI), Ministry of Natural Resources and Environment of Viet Nam

Vice-Chair: Ms. Angeline Chui, Acting Deputy Director of International Policy, Ministry of Sustainability and the Environment of Singapore

Rapporteur: Ms. Vizminda A. Osorio, Assistant Director, Environmental Management Bureau, Department of Environment and Natural Resources (DENR) of the Philippines

2.2 Organization of work

10. The Chair confirmed that the Bureau had received valid credentials from all nine COBSEA participating countries prior to the Meeting.

11. The Chair announced that the Meeting would take place virtually on 8 and 9 September 2021 from 13.00 to 16.00 ICT (UTC +7) using the platform Webex, subject to adjustment as necessary.

12. The Chair invited the Secretariat to introduce the working and information documents as presented in information document UNEP/COBSEA IGM25/INF2.

13. The Secretariat briefed the Meeting participants on the process for decision-making at the virtual Meeting and proposed the development of two separate resolutions for adoption by each part of IGM 25.

14. People's Republic of China requested more clarification on the proposed adjustment to the procedure of two separate resolutions and which documents would be considered for the first resolution. The Secretariat clarified these points and assured the delegates that a full draft of the resolution would be circulated after the Meeting as part of the Meeting report.

15. The Chair acknowledged the proposed process on behalf of participating countries.

2.3 Adoption of the agenda

16. The Chair invited the Secretariat to introduce the provisional agenda of the Meeting, presented as working document UNEP/COBSEA IGM25/1 rev.1. He said that the provisional agenda and the annotated provisional agenda (UNEP/COBSEA IGM25/2 rev.1) had been circulated, in accordance with the Rules of Procedure applicable to the Meeting, at least six weeks in advance to the Meeting.

17. After considering the provisional agenda submitted by the Secretariat, the Meeting adopted the agenda attached as Annex 2 to this report.

18. The Chair reminded participating countries that, due to time constraints, any opening statements would be circulated in writing. Delegations were invited to share written statements with the Secretariat during the Meeting.

19. In Thailand's written statement, the delegation expressed their appreciation for all of the progress made over the years by the Secretariat, highlighting the significant contribution of the SEA circular project to RAP MALI implementation. They commended COBSEA for their cooperation with the Blue Solutions Initiative toward capacity building in marine and coastal spatial planning (MCSP) and establishing a COBSEA network of Marine Protected Areas (MPAs). Moreover, they welcomed progress of the project on Implementing the Strategic Action Programme for the South China Sea and Gulf of Thailand (SCS SAP). Thailand expressed their gratitude to UNEP and COBSEA and their enthusiasm for constructive discussions during the Meeting.

20. In Malaysia's written statement, the delegation congratulated UNEP and COBSEA for the successful organization of IGM 25 despite the challenges of the COVID-19 pandemic. They highlighted the importance of implementing a green recovery approach to spur the economy and social well-being of countries as well as to drive national and regional development on a pathway toward low carbon and climate resilience. They informed participants that the Ministry of Environment and Water of Malaysia was spearheading the development of a number of environmental policies for low carbon and resource efficient development, including an Extended Producer Responsibility Roadmap for a circular economy approach and mitigation of plastic pollution. They thanked COBSEA and the Government of Sweden for their technical, financial, and legal support in the development of the Malaysia Marine Litter Roadmap, which was planned for launch at the upcoming SEA of Solutions partnership event in November 2021.

21. The written statement received by Republic of Korea stressed the importance of seeing the economic recovery after COVID-19 as an opportunity to rebuild stronger and work on the prevention of plastic pollution in addition to its collection. The delegation emphasized their commitment to taking more robust policy actions and increasing collaboration between local, central, and government agencies to reduce marine plastic waste flows into the ocean through "waste barriers" in waterways. Other policy actions that were being developed included the launch of the Marine Litter Management Commission for more comprehensive and harmonized approaches and international instruments to address marine litter issues. The Republic of Korea concluded their statement by conveying their continued support toward strengthening COBSEA activities to protect the marine and coastal environment in the East Asian Seas region for the health and well-being of present and future generations.

3 AGENDA ITEM 3: REPORT OF THE EXECUTIVE DIRECTOR OF THE UNITED NATIONS ENVIRONMENT PROGRAMME ON THE IMPLEMENTATION OF COBSEA ACTIVITIES 2019--2020

22. The Chair invited the Secretariat to present a summary of the report of the Executive Director of the United Nations Environment Programme on the implementation of COBSEA activities carried out during the period 2019-2020, shared as working document UNEP/COBSEA IGM 25/3.

23. The COBSEA Secretariat presented the report, highlighting key activities carried out during the biennium toward implementation of the COBSEA workplan. The Secretariat drew attention to reporting on specific provisions of the resolution adopted by the Twenty-fourth Intergovernmental Meeting (IGM 24). The report addressed three focus areas of COBSEA Strategic Directions 2018--2022: regional governance, land-based marine pollution, and marine and coastal planning and management. The report included a financial report for the period 2019-2020 and the status of contributions to the Trust Fund as of 1 July 2021.

24. The Secretariat further presented the financial performance of the East Asian Seas Trust Fund (Trust Fund) for the period of 2019-2020, prepared in accordance with the UN Financial Rules and Procedure and the financial Rules and Procedure for COBSEA. A total of USD 632,254 had been received in country contributions to the Trust Fund during the 2019-2020 period. During the period under review, the total cost incurred against the COBSEA Trust Fund amounted to USD 683,482, inclusive of 13 per cent Programme Support Cost. UNEP authorized COBSEA to continue operation pending approval of the 2021-2022 biennial budget.

25. The Chairperson thanked the Executive Director of the United Nations Environment Programme and the COBSEA Secretariat for activities implemented and progress made and invited any questions for clarification from participating countries.

26. Republic of Korea highlighted that discrepancies in their contribution to the Trust Fund were caused by currency exchange fluctuations and would be addressed as soon as possible.

27. The People's Republic of China thanked the Secretariat for its efforts on marine protection during difficult circumstances due to COVID-19. The delegate emphasized that the Intergovernmental Meeting was the final decision-making body for COBSEA and requested the Secretariat to continue sharing updates on projects and activities with National Focal Points to strengthen transparency. The representative welcomed savings accrued in the Trust Fund and highlighted that participating countries' economies were now recovering from COVID-19. She proposed to prioritize projects and activities for funding in line with regional priorities.

28. The delegate from Malaysia thanked the Secretariat and UNEP for their work during the biennium, especially given the challenges brought on by COVID-19. He highlighted the need to take urgent interventions to tackle plastic waste and advance on-the-ground implementation of projects. He announced that Malaysia was in the final stages of launching the national Marine Litter Roadmap and Action Plan, which would guide actions from 2021 to 2030. He commended the Secretariat for the report and expressed interest in discussing any outstanding matters in part two of the IGM 25.

29. The head of delegation from Indonesia endorsed the report and welcomed the implementation of various activities since the IGM 24. The representative noted the opportunity for further strengthening regional partnerships, South-South cooperation, and knowledge sharing. The delegate highlighted that Indonesia had paid their contribution to the Trust Fund for the period 2019-2020 in full since the development of

the report. The Coordinator clarified that the report only reflected contributions received by December 2020 and that Indonesia's contributions had been included in the workplan and budget for the current biennium.

4 AGENDA ITEM 4: COBSEA REGIONAL ACTION PLAN ON MARINE LITTER

4.1 Update on current and planned marine litter projects and activities

30. The Chairperson invited the Secretariat to provide a brief update on ongoing marine litter projects and activities and planned initiatives in the pipeline, toward achieving the RAP MALI as contained in UNEP/COBSEA IGM 25/4. The Secretariat shared that the SEA circular project continued to contribute to achieving the COBSEA RAP MALI, including through assessment of waste leakage hotspots, strengthening and harmonizing marine litter monitoring programmes, supporting evidence-based policy development and planning, solution sharing and partnerships, and regional knowledge management. The Secretariat detailed the gaps and priorities for project development recommended by the Working Group on Marine Litter (WGML) with a focus on regional knowledge sharing of good practices on improved waste management and circular economy approaches, enhancing marine litter monitoring with a view to assessing regional status and trends, developing the East Asian Seas Regional Node, organizing regional events for networking, addressing existing marine litter in the environment, and preventing marine litter from sea-based sources.

31. The Secretariat updated the Meeting on ongoing and planned projects and activities, including ongoing legislative guidance on marine litter provided by UNEP to COBSEA countries based on expressions of interest, as well as support for pilot activities to demonstrate integrated solid waste management to prevent marine litter with funding under the US Environmental Protection Agency (USEPA)-UNEP umbrella agreement. Upcoming project opportunities to implement the RAP MALI, identified by the WGML, included 'Marine litter prevention through reduction, sustainable design & recycling of plastic packaging' (MA-RE-DESIGN--) funded by the Government of Germany through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and 'Promoting resource efficiency and circularity to reduce plastic pollution for Asia and the Pacific' funded by the Global Environment Facility (GEF) through the Asian Development Bank (ADB), which would commence toward the end of 2021. The Secretariat highlighted that the Third Meeting of the WGML had encouraged the Secretariat to further pursue the development of presented projects toward achieving the RAP MALI and that funding opportunities identified had been included in the biennial workplan for implementation of the RAP MALI for consideration by the IGM 25.

32. The Chair invited participating countries and observers to provide feedback on activities.

33. People's Republic of China thanked the Secretariat for the hard work toward implementing the RAP MALI and expressed their appreciation for progress made on activities. The representative suggested focusing activities on two main areas, namely technical guidance for participating countries to address marine litter, and sharing knowledge and good practices, noting each country's unique circumstances and policies. He noted that many activities related to marine litter were funded by external donors and expressed hope that knowledge and experience would be shared across all participating countries to build capacity through regional activities, such as under the SEA circular project. Related to harmonizing monitoring methodologies, he noted existing efforts to harmonize monitoring by the scientific community and the Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP). He noted that regional-level efforts to harmonize monitoring should align with global efforts.

34. The Secretariat confirmed that priority was given to technical assistance and knowledge sharing to inform project development, in line with guidance from the WGML. The Secretariat clarified that regional efforts to harmonize and strengthen marine litter monitoring were aligned closely with global guidance and processes, such as the GESAMP Guidelines, and that countries recognized that regional mechanisms such as COBSEA should be leveraged to advance harmonization at the global level.

35. The representative from Malaysia expressed appreciation for support on integrated waste management and interest in working with COBSEA to support Malaysia's efforts to close the loop on plastic pollution. He suggested that COBSEA consider tackling marine litter both upstream and downstream, as well as strengthening midstream efforts to engage consumers and address issues of demand and consumption of plastic products.

36. The representative of GIZ thanked the Secretariat for inviting them as an observer and highlighted that the planned joint marine litter project with COBSEA 'MA-RE-DESIGN' was a great opportunity to strengthen knowledge sharing and regional cooperation in line with regional priorities. He noted that GIZ was already working with six of the nine COBSEA countries in similar projects and that he expected the new project to commence in early 2022.

4.2 Biennial workplan for implementation of the COBSEA Regional Action Plan on Marine Litter

37. The Chairperson invited the Secretariat to present the draft biennial workplan for implementation of the COBSEA Regional Action Plan on Marine Litter, presented as working document UNEP/COBSEA IGM 25/5.

38. The Chair reminded delegates that the workplan had been developed and discussed at length by the Working Group on Marine Litter, as per its mandate. The Third Meeting of the Working Group on 29-30 June 2021 had further revised the workplan and recommended it for adoption by part one of the IGM 25. The workplan was circulated in accordance with the Rules of Procedure of the Meeting and participating countries had been invited to provide any remaining comments prior to the Meeting.

39. The Secretariat presented the draft biennial workplan for implementation of the COBSEA RAP MALI. Ms. Harms highlighted that the workplan was structured along the four main actions of the RAP MALI and corresponded to the list of key actions contained in Appendix 2 of the RAP MALI. The workplan identified specific activities and deliverables, the roles within COBSEA and of partners, existing and pipeline funding, a timeframe for implementation, and the status of implementation. She stressed that the workplan focused on activities collectively pursued by COBSEA countries because they are regional in nature or require coherent national efforts and that all activities were achievable using existing resources or identified additional funding to provide adequate capacity for implementation of the RAP MALI. She further noted that the workplan format enabled regular progress tracking and reporting of implementation.

40. The Chair invited participating countries to provide any comments or questions for clarification.

41. The delegate from Malaysia appreciated the Secretariat's efforts to include activities on sea-based sources in the workplan and suggested that COBSEA include island-specific activities on marine litter and focus not only on planning, but on implementation. He confirmed that Malaysia was ready to endorse the biennial workplan.

42. People's Republic of China sought clarification on projects in the pipeline, the use of external funding sources, the status on the implementation of activities such as 2.1 in the workplan, as well as on target countries'activities, and whether the progress reporting format was compulsory or voluntary. They voiced

concern that activity 3.2 in the workplan to plan a possible regional report on the status of marine litter referred to reporting against Sustainable Development Goal (SDG) target 14.1 which may be outside of COBSEA national focal agencies' responsibility. The delegate noted that the IGM should make the final decision on financial resources and requested the Secretariat keep countries informed on progress and participation in activities.

43. The Secretariat clarified that the workplan clearly identified funding sources to ensure sound implementation of activities, including existing projects such as SEA circular and new initiatives described in working document UNEP/COBSEA IGM 25/4 and UNEP/COBSEA IGM 25/5. Ms. Harms highlighted that projects in the pipeline had been presented to countries for review on multiple occasions and that new, identified extrabudgetary resources had been endorsed for inclusion in the workplan by the Third Meeting of the WGML and recommended for adoption by part one of the IGM 25 in order to provide the necessary resources and capacity to implement the RAP MALI. She referred to the definition of implementation status from 'not started' to 'initiated', 'underway', 'advanced' and 'completed', as contained in document UNEP/COBSEA IGM 25/5. She further clarified that the workplan format enabled regular progress tracking toward the implementation of the RAP MALI by the Secretariat to the WGML in order to inform progress reporting to the IGM, as per the mandate of the WGML. Progress reporting of countries to COBSEA on national marine litter planning and activities would follow a simple reporting spreadsheet developed through the WGML (as contained in UNEP/COBSEA IGM 25/INF8) for consideration at part two of IGM 25. She reiterated that the Secretariat was mindful of keeping reporting burdens for countries to a minimum and aimed to align reporting with national and regional processes as much as possible. She explained that legislative guidance provided by UNEP under activity 2.1 had commenced and was being provided to Cambodia, Malaysia and the Philippines based on countries' expression of interest. She noted the delegate's concerns regarding activity 3.2 and clarified that this wording corresponded directly with Appendix 2 of the RAP MALI and that the activity focused on preparing a plan for a possible regional report on marine litter for discussion with countries, like assessments conducted by other Regional Seas programmes.

44. Philippines emphasized that activities in the workplan directly responded to their needs and were in line with their National Plan of Action on Marine Litter (NPoA) which was currently being rolled out. They added that that the workplan was helpful to identify opportunities to support NPoA implementation. The delegation endorsed the workplan.

45. Republic of Korea expressed their appreciation for the workplan and informed the Meeting that the Seventh International Marine Debris Conference was scheduled in Busan, Republic of Korea, in 2022, supported by UNEP.

46. The delegation from Singapore thanked the Secretariat and expressed their support for activities to promote evidence-based action. They encouraged COBSEA to work closely with countries to respond to needs and coordinate relevant information, and to work with UNEP to avoid duplication.

47. Thailand expressed their thanks to the Secretariat for developing marine litter activities and emphasized that activities included in the workplan were not new, but rather that they corresponded directly to the RAP MALI, which had been adopted by countries. Thailand endorsed the workplan and the delegate welcomed its implementation.

48. Indonesia expressed their support for the adoption of the biennial workplan as presented and voiced their commitment to working with COBSEA countries for successful implementation.

49. Following the discussion, the Chair invited participating countries to adopt the biennial workplan through statements by Heads of Delegation. Eight participating countries endorsed the document. Delegates from People's Republic of China requested further opportunity for review.

50. The Chair requested the Secretariat to circulate the document for review and adoption by silence procedure.

51. Following the Meeting, the Secretariat shared the revised draft biennial workplan for implementation of the COBSEA RAP MALI reflecting feedback provided to the IGM for further review by participating countries. Additional comments were received and addressed by the Secretariat, upon which the final revised document was shared with participating countries and adopted by silence procedure on 12 November 2021. The adopted document is attached in Appendix 1.

4.3 Regional Guidance on Harmonized National Marine Litter Monitoring Programmes

52. The Chair invited the Secretariat to present the draft Regional Guidance on Harmonized National Marine Litter Monitoring Programmes, presented as working document UNEP/COBSEA IGM 25/6.

53. The Secretariat presented the Regional Guidance document, which included, in Part I, a review of monitoring, survey designs and methodologies; in Part II, an inventory of monitoring efforts in COBSEA countries; and in Part III, recommendations for harmonizing marine litter monitoring. Ms. Harms highlighted that the RAP MALI identified the need for robust monitoring and that key action 3.2.1 in Appendix 2 of RAP MALI called for the preparation of regional guidance on the development of harmonized National Marine Litter and Microplastic Monitoring Programmes, in line with globally established guidelines. She explained that the Secretariat, in partnership with the Commonwealth Scientific and Industrial Research Organisation (CSIRO), had followed steps identified by the WGML at its technical consultation in June 2020 and had compiled a regional monitoring inventory as the foundation for targeted recommendations on regional harmonization. The Regional Guidance document had been developed in extensive consultation with participating countries and had undergone several rounds of review, including through regional webinars and consultations of the WGML. The Third Meeting of the WGML had further revised the Regional Guidance and recommended its adoption by the first part of IGM 25. The WGML had also established an Expert Group on Monitoring to support implementation of Regional Guidance.

54. The Secretariat stressed that harmonization of national marine litter monitoring programmes in the context of the Regional Guidance did not entail establishing identical monitoring programmes across all countries. Rather, the document provided regionally appropriate recommendations of robust methods, data standards,common core indicators, and objectives based on existing efforts and capacities in the region as well as international guidance toward facilitating better data comparability and strengthening of monitoring efforts in line with globally established guidelines. To increase synergies, COBSEA guidance on harmonization may be leveraged as a foundation for similar regional efforts related to the Association of Southeast Asian Nations (ASEAN) Regional Action Plan on Marine Debris and to inform global-level efforts to strengthen harmonization.

55. The Chair invited participating countries to provide any comments or questions for clarification.

56. The delegation from People's Republic of China suggested that the title of the document may need to be amended to reflect the focus on research and review rather than providing a technical handbook. The delegate expressed concern that the Regional Guidance should follow existing guidance at the global level, including the GESAMP Guidelines, to align harmonization efforts.

57. The Secretariat stressed the importance of the agreement of all participating countries on the title of the document but clarified that the Regional Guidance document provided practical guidance and targeted recommendations on strengthening monitoring based on a review of existing monitoring efforts and gaps in the region, as requested by the WGML. The document went beyond a research report and did not claim to provide a technical handbook, but rather referred to further technical guidance on survey methodologies throughout to avoid duplication. The Regional Guidance would be complemented by technical trainings in the coming months, including development of more technical training materials. The Secretariat suggested to discuss details of nomenclature further bilaterally with People's Republic of China after the Meeting to inform any revision. Ms. Harms confirmed that the document was aligned explicitly with international guidance including the GESAMP Guidelines and provided regionally appropriate recommendations for their implementation, cased on country needs and capacities. She further noted that regional efforts to strengthen harmonization of monitoring approaches fundamentally contributed to respective efforts at global level and that countries had recognized the need to build on regional mechanisms such as the Regional Seas to accelerate global responses to marine litter, including at recent meetings of the ad hoc open-ended expert group on marine litter (AHEG).

58. The Cambodia delegation requested clarification between the role of the Expert Group on Monitoring and the Working Group on Marine Litter. The Secretariat explained that the Expert Group had been established under the WGML to leverage the expertise of additional monitoring experts in activities of the WGML and implementation of the RAP MALI.

59. Malaysia thanked the Secretariat for development of Regional Guidance and noted that the document did not constitute top-down instructions, but rather that it supported countries to improve monitoring based on their capacities and needs. The delegate suggested that the guidance document could be adopted as a living document that could be adapted as needed in the future to capture global developments and address People's Republic of China's concerns.

60. Thailand thanked the Secretariat and WGML for their efforts and emphasized that the Regional Guidance provided good recommendations.

61. The Chair invited participating countries to adopt the Regional Guidance through statements by Heads of Delegation. Eight participating countries endorsed the document. Delegates from People's Republic of China requested further opportunity for revision of terminology in the document.

62. The Chair requested the Secretariat to circulate the document for review and adoption by silence procedure.

63. Following the Meeting, the Secretariat shared the revised draft Regional Guidance on Harmonized National Marine Litter Monitoring Programmes reflecting feedback provided to the IGM for further review by participating countries. Additional comments were received and addressed by the Secretariat, upon which the final revised document was shared with participating countries and adopted by silence procedure on 12 November 2021. The adopted document is attached in Appendix 2.

4.4 East Asian Seas Regional Node of the Global Partnership on Marine Litter

64. The Chair invited the Secretariat to present the Terms of Reference of the East Asian Seas Regional Node of the Global Partnership on Marine Litter (GPML) as contained in working document UNEP/COBSEA IGM 25/7.

65. The Secretariat presented the Terms of Reference of the East Asian Seas Regional Node of the GPML, including objectives, functions, governance and institutional arrangements, and funding. Ms. Harms recalled the resolution adopted by IGM 24, requesting the Secretariat, in consultation with the WGML, to develop the Regional Node, for consideration by IGM 25. In line with guidance provided by the technical consultation of the WGML in June 2020, the Secretariat had developed services for integration in the Regional Node further together with regional partners and the GPML and had identified funding resources to ensure the sustainable establishment, development and maintenance of the Node. Ms. Harms explained that the Terms of Reference had been developed in extensive consultation with participating countries and revised based on WGML inputs. At the Third Meeting of the WGML, Indonesia had reaffirmed interest in exploring the role of the Regional Capacity Center for Clean Seas (RC3S) as a host institution of the Node. Participating countries had welcomed Indonesia's initiative and suggested an interim hosting arrangement including the Secretariat to develop hosting arrangements upon establishment of the Node based on the Terms of Reference. The Third Meeting of the WGML had consequently recommended the Terms of Reference for adoption by the first part of IGM 25.

66. The Secretariat added that, upon adoption of the revised Terms of Reference, the Secretariat would work with the RC3S as advised by the WGML and submit a letter to the GPML Steering Committee expressing interest to establish the Regional Node. Upon acceptance by the Steering Committee, the GPML would provide seed funding and support for the establishment of the Node as needed. The Secretariat would work with the RC3S and WGML to establish organizational governance and operational structures of the Node with a view to transferring hosting responsibilities to the RC3S and any co-hosting institutions.

67. Ms. Heidi Savelli from UNEP added that UNEP would continue its support of the Regional Nodes and looked forward to developing the COBSEA Node. She reiterated that support would be provided by the GPML to ensure sustainable funding and operation of the Node, following the example of other Regional Seas Nodes.

68. The Chair invited participating countries to provide any comments or questions for clarification.

69. The delegation from People's Republic of China thanked the Secretariat for additional information and requested clarification on whether the Terms of Reference or the Regional Node itself were being discussed for adoption. Furthermore, they requested clarification on the funding contribution by the hosting institution after 2024 as well as assurance that the Node would not incur any cost to the Trust Fund. The delegate asked for clarification on the relationship between COBSEA countries, the IGM and the GPML related to the Node. The delegate further suggested that reference to specific projects may not be appropriate in the body of the Terms of Reference.

70. In response, the Secretariat suggested deleting reference to SEA circular in paragraph 13. The Secretariat clarified that the Regional Node would become part of COBSEA's institutional structure. Extrabudgetary funding through projects had been secured to finance the Node which would incur no cost to the Trust Fund. Ms. Savelli clarified that the GPML supports countries and activities of Nodes and that funding was provided for establishment and setup of Nodes, as well as for additional project development in line with Node priorities.

71. Malaysia expressed their support for an interim hosting arrangement involving the Secretariat, as outlined by the Terms of Reference, until more permanent hosting arrangements could be finalized. The delegate stressed that should RC3S become the host institution, sea-based sources of marine litter would also need to be addressed in line with the RAP MALI.

72. Cambodia stressed the importance of sustainable financing and requested that all participating countries work together to avoid additional financial burdens to countries. They suggested to confirm arrangements related to expression of interest to host the Node.

73. Singapore emphasized that the comments given under this agenda item were important to consider and suggested that appropriate revision be made to the Terms of Reference before adoption.

74. The Chair invited Indonesia to provide any additional information related to the Regional Node, considering their initiative to explore hosting arrangements of the RC3S.

75. Indonesia recalled the resolution of IGM 24 to develop the Regional Node and confirmed their commitment to this collectively agreed outcome. The delegate recommended adoption of the Terms of Reference of the Regional Node and reiterated Indonesia's offer to explore the role of the RC3S as host institution, considering the strong alignment of RC3S' mandate with objectives of the Node. He highlighted that the Regional Node would significantly support implementation of the RAP MALI and facilitate regional knowledge sharing. As the host of the Regional Node, the RC3S would address the protection of the marine environment in a holistic manner, both from land-based and from sea-based activities. They acknowledged suggestions made by countries for an interim hosting arrangement including the COBSEA Secretariat to further develop organizational matters upon establishment of the Node.

76. The Chair invited participating countries to adopt the Terms of Reference of the East Asian Seas Regional Node of the Global Partnership on Marine Litter by silence procedure and requested the Secretariat to circulate the document for review accordingly.

77. Following the Meeting, the Secretariat shared the revised draft Terms of Reference of the East Asian Seas Regional Node of the GPML reflecting feedback provided to the IGM for further review by participating countries. Additional comments were received and addressed by the Secretariat, upon which the final revised document was shared with participating countries and adopted by silence procedure on 12 November 2021. The adopted document is attached in Appendix 3.

5 AGENDA ITEM 5: UPDATE ON PROJECTS AND ACTIVITIES IN THE CONTEXT OF THE EAST ASIAN SEAS ACTION PLAN

5.1 Implementing the South China Sea Strategic Action Programme (SCS-SAP)

78. The Chair invited Ms. Virginie Hart, Senior Project Manager for the UNEP GEF project 'Implementing the Strategic Action Programme for the South China Sea,' to present an update of GEF-funded activities toward implementing the Strategic Action Programme for the South China Sea (SCS-SAP), as presented in working document UNEP/COBSEA IGM 25/4.

79. Ms. Hart specified the three components of the SCS-SAP project: to reduce habitat degradation and loss via national and local reforms to achieve SAP targets for coastal habitat management in the South China Sea, to strengthen knowledge-based action planning for the management of coastal habitats and land-based pollution to reduce environmental degradation of the South China Sea, and to facilitate regional and national level integration and cooperation for implementation of the SCS-SAP. She detailed the national and regional coordination structure of the project and informed the Meeting that the project had been extended to June 2024. Ms. Hart explained that the project had faced some delays due to change in project management and COVID-19. The lengthy inception phase had allowed for national-level

consultations and revision of activities and a successful first steering committee meeting and inception workshop had been held in June and July 2021. She highlighted that COBSEA had an umbrella coordinating role for the project and might execute activities under component 3, ensuring alignment with COBSEA Strategic Directions. The project team would work with COBSEA to explore potential for collaboration, including on land-based pollution.

80. The Chair invited participating countries and observers to provide any comments or questions for clarification.

81. People's Republic of China expressed appreciation for the update on progress and proposed increased allocation of resources toward country activities for implementation of the SCS-SAP. People's Republic of China would continue to support the project and wished the project a successful implementation.

82. Delegates from the Philippines mentioned that the activities laid down for the SCS-SAP complement the ones under their NPoA and expect that the synergies between the two programmes would bring about significant impact in the management of land-based pollution.

83. Delegates from Indonesia supported cooperation efforts between COBSEA participating countries to enhance impact and sustainability of the project.

5.2 Marine and coastal planning and management, nutrient pollution and biodiversity-related activities

84. The Chair invited the Secretariat to present other initiatives related to marine and coastal planning and management, nutrient pollution and biodiversity, as presented in UNEP/COBSEA IGM 25/4.

85. The Secretariat presented the rationale and overview of other initiatives under implementation or under development, including training workshops held with the Blue Solutions Initiative on marine and coastal spatial planning, ongoing work towards establishing a COBSEA network of marine protected areas, and an upcoming training on sustainable ocean economy. Mr. Pradhan highlighted COBSEA's collaboration with the Global Partnership on Nutrient Management (GPNM) to conduct a nutrient pollution review to inform further activities. He concluded by sharing information on a webinar series on the post-2020 Global Biodiversity Framework held in 2020.

86. The Chair expressed his thanks for the Secretariat's efforts to support participating countries in achieving the targets of the Strategic Directions and to explore additional project opportunities and initiatives. He invited participating countries and observers to provide any comments or questions for clarification.

87. Delegates from Indonesia expressed their support of activities and welcomed further discussion on implementation.

88. The representative from WWF commended COBSEA participating countries' continued cooperation in the Regional Seas programme. It was noted with appreciation the numerous efforts of COBSEA toward the sustainable development and protection of the marine environment and coastal areas of East Asian Seas. The delegate invited all interested stakeholders to the launch of the flagship regional report 'A Global Treaty on Plastic Pollution: Perspectives from Asia' on October 25, 2021, which was produced in collaboration with academic partners from around the region with valuable input from several government representatives in the region. A written statement made by WWF was shared with participating countries.

6 AGENDA ITEM 6: WORKPLAN AND BUDGET FOR THE BIENNIUM 2021-2022

6.1 Presentation of workplan and budget

89. The Chair invited the Secretariat and UNEP Ecosystems Division to present the draft workplan and budget for COBSEA for the biennium, as contained in working document UNEP/COBSEA IGM 25/8.

90. The Secretariat presented the workplan and budget. The Secretariat explained that the UN Financial Rules and the specific procedures for the operation of COBSEA were applicable to the management of the Trust Fund. The Coordinator provided an overview of the proposed budget for the biennium 2021-2022. He stressed that despite the forecast of a positive cash closing position in 2021 and in 2022, the proposed budget exceeded the expected income of the East Asian Seas Trust Fund in both years due to increases in standard staff and office costs and current yearly contribution levels falling short of the level agreed in Resolution 1 adopted by the Twenty-first Intergovernmental Meeting (IGM 21). The Secretariat proposed to revert the Coordinator position back to P5 level and to unfreeze the G6 administrative assistant position to strengthen Secretariat capacity and bring staffing in line with other Regional Seas programmes, by using savings in gradual transparent phases until 2026. The Secretariat emphasized that the accumulated fund balance of the Trust Fund was not sustainable long term and that participating countries may wish to consider increasing annual contributions to the Trust Fund in future to strengthen human capacity of the Secretariat, as suggested in the Strategic Directions. He noted that the Trust Fund was currently complemented by extrabudgetary project funding of around five times the size of the Trust Fund. The Secretariat would continue to mobilize extrabudgetary resources on marine pollution and marine and coastal management in line with the Strategic Directions.

91. Ms. Kerstin Stendahl, Head of the Ecosystems Integration Branch of UNEP, highlighted that COBSEA was an integral part of the 18 Regional Seas programmes and one of six Regional Seas Secretariats administered by the UNEP Ecosystems Integration Branch. She emphasized that a reclassification of the Coordinator post to P5 level would ensure alignment with other UNEP-administered Regional Seas programmes, such as the Northwest Pacific Action Plan (NOWPAP). The Coordinator post included responsibilities considered to be at P5 level, including leadership functions. This reclassification was timely given the crucial importance and increasing role of COBSEA and Regional Seas programmes in the global ocean governance system as effective mechanisms of connecting the national and the global level to address transboundary challenges. Ms. Stendahl stressed that COBSEA could afford this change in a sustainable manner and encouraged participating countries to make use of accrued savings in a gradual and staggered approach toward strengthening the capacity of the Secretariat. If needed, countries could reconsider the classification of the Coordinator post in the future depending on the availability of funds. She noted that the recruitment of a more permanent Coordinator would begin shortly and thanked Mr. Pradhan for his contribution in the interim.

92. The Chair invited clarifying questions on the workplan and budget.

93. Delegates from People's Republic of China thanked the Secretariat welcomed the Secretariat's efforts to develop the workplan and budget and to clarify reasons for the proposed reclassification. They requested additional information on budget items and governance, such as information on the terminal evaluation of the Strategic Directions. Regarding the Coordinator post, they invited examples of similar positions at P5 level and use of COVID-related savings. They noted that implementation of activities suggested that the Secretariat was running well and expressed concern that changes would not be sustainable past 2026 at current Trust Fund contribution levels. They suggested to include mention of a possible revision and updating of the RAP MALI in the workplan to align with developments at global level, as needed.

94. Ms. Stendahl thanked People's Republic of China for their comments and clarified that savings in the Trust Fund were not necessarily related to COVID, but longstanding staffing issues. Participating countries could address any misalignment of budget and country contributions in the coming years. She reiterated the proposal to put the current savings to good use for implementation of COBSEA's mandate rather than continuing to accrue savings, which was also not in the interest of donors who may provide project funding.

95. The Secretariat further clarified that a terminal evaluation of the current Strategic Directions was required to inform the development of new Strategic Directions from 2023, which would be discussed further at part two of IGM 25. The Secretariat noted that the Coordinator post had been reclassified from D1 to P5 to P4 level in the past. Further, as per the Terms of Reference of the WGML, the Working Group could provide recommendations to the IGM to revise the RAP MALI as relevant.

96. Malaysia expressed their agreement that the Secretariat needed to be strengthened to implement COBSEA functions and activities. The delegate noted that the Trust Fund still fell short of the minimum threshold of funding from participating countries needed for sustainable management. He stressed that the Strategic Directions should match any upgrade in staffing levels and noted that due to COVID impacts on country economies, now was not the right time to increase contributions. Malaysia requested more information on the way forward for sustainable financing beyond 2026 and on the value added of a reclassification. Should the IGM endorse the upgrade, Malaysia requested that the Secretariat provide further assistance to participating countries in terms of country readiness to address global response options to marine litter, under consideration of individual country capacities.

97. Ms. Stendahl took note of the comment on salary cost related to operational cost and assured delegates that the Secretariat could provide more information. Regarding added value of the upgrade, she emphasized that it was adequate considering the services countries are expecting from COBSEA.

6.2 Process for resource mobilization and proposal of activities

98. The Chair invited the Secretariat to present the process for proposal and approval of activities and resource mobilization in the context of the East Asian Seas Action Plan, as contained in Annex 1 of UNEP/COBSEA IGM 25/8.

99. The Secretariat reemphasized that participating countries made annual financial contributions to the Trust Fund in line with resolution 1 of IGM 21 to support core functions of COBSEA including the Secretariat and Intergovernmental Meetings. However, at current contribution levels, this did not encompass funding for activities and project development. The Strategic Directions in paragraph 36 recommended the development of a plan for strengthening human capacity and resource mobilization to address this sustainability issue. Ms. Harms elaborated that the Secretariat periodically identified project development and funding opportunities based on regional needs, in line with paragraphs 69 and 37 of the East Asian Seas Action Plan, toward implementation of the East Asian Seas Action Plan, Strategic Directions and RAP MALI, for review by countries through email correspondence, bilateral calls, webinars, Intergovernmental Meetings and the WGML. National Focal Points were requested to review and approve project proposals and activities in line with the COBSEA mandate and regional priorities through the Intergovernmental Meeting, and, during intersessional periods, approval for time-sensitive proposals may be given via email correspondence following adequate consultation and review. Projects and activities related to the RAP MALI would be developed through the WGML and considered by the Intergovernmental Meeting as part of biennial rolling workplans, as per resolution of IGM 24.

100. The Chair invited participating countries to provide feedback on the process.

101. The delegation from People's Republic of China thanked the Secretariat and proposed that the use of different financial resources from the Trust Fund and extrabudgetary sources from non-COBSEA countries be distinguished more clearly in the document and to clarify processes for resource mobilization further, including definitions of scale.

102. The Secretariat thanked delegates for their suggestions and agreed to revise Annex I further and continue to engage with participating countries on resource mobilization in future.

103. The Chair requested the Secretariat to circulate the workplan and budget for country review and adoption by silence procedure within two weeks of receiving the document. He encouraged all participating countries to provide their constructive feedback to enable the swift adoption of the workplan and budget and ensure continued operation of the Secretariat.

104. Following the Meeting, the Secretariat shared the revised workplan and budget for COBSEA for the biennium reflecting feedback provided to the IGM for further review by participating countries. Additional comments were received and addressed by the Secretariat, upon which the final revised document was shared with participating countries and adopted by silence procedure on 12 November 2021. The adopted document is attached in Appendix 4.

7. AGENDA ITEM 7: DATE AND VENUE FOR NEXT MEETING

105. The Chairperson thanked participants for their active participation and reiterated that the Government of Viet Nam planned to host the second part of IGM 25 in-person in Viet Nam as soon as possible in 2022. He requested that the Secretariat communicate feasible date and venue for the second part of the Meeting as soon as possible to National Focal Points to continue implementation of the workplan in regular correspondence with participating countries in preparation for part two of the Meeting.

106. The Secretariat presented suggested agenda items for part of IGM 25 related to governance, including on the evaluation of Strategic Directions 2018-2022 and development of new Strategic Directions, the finalization of the Outlook on ocean-related SDGs, consideration of additional observer countries to the Intergovernmental Meeting and the role of the Bureau in intersessional periods, strengthening coordination with regional partners such as ASEAN. Related to the institutional structure of COBSEA, the Secretariat suggested an agenda item on the establishment of the RC3S as a COBSEA Regional Activity Centre and scoping of future Centres. Proposed thematic agenda items included providing progress on projects and activities, considering the reporting format and process on marine litter planning, and updates on relevant regional and global processes including by observers.

8. AGENDA ITEM 8: ANY OTHER BUSINESS

107. The Chairperson invited participants to raise any other matter they would like to discuss in the Meeting.

108. The delegates from People's Republic of China commended the efforts by the Secretariat and participating countries at this virtual Meeting in the face of technical challenges and emphasized that People's Republic of China would provide written comments for further information and to revise discussed documents for adoption by silence procedure.

9. AGENDA ITEM 9: PRESENTATION OF THE DRAFT MEETING REPORT AND PROCESS FOR ADOPTION

109. The Chairperson invited the Secretariat to share the draft Meeting report and resolution on screen and present the process for adoption.

110. The Secretariat shared the draft report and resolution of part one of IGM 25 to participating countries and explained that, due to the virtual modality of the Meeting, the Secretariat would develop the report further following the Meeting, for review by the Rapporteur, and circulation to countries within two weeks of the Meeting (or as soon as possible, pending outcomes of the silence procedure). National Focal Points would be invited to review the report and to adopt the report of the Meeting via email correspondence within two weeks of receiving the document.

111. The Chairperson asked the Secretariat and the Rapporteur to develop the Meeting report and resolution and share it with participating countries for review and adoption as presented.

112. Following the Meeting, the Secretariat finalized the Meeting report with comments by participating countries and the Rapporteur reviewed the report and resolution of the Meeting. The Meeting report and resolution were adopted by silence procedure on 12 November 2021.

10. AGENDA ITEM 10: CLOSING OF THE MEETING

113. The Chair invited the Secretariat to provide a summary of the Meeting.

114. The Secretariat highlighted that the first part of IGM 25 was the first virtual IGM with over 90 participants. During the Meeting, participating countries engaged actively in discussions on the Report of UNEP Executive Director on COBSEA Activities 2019-20, activities in the context of the Regional Action Plan on Marine Litter and the Strategic Directions, as well as the workplan and budget for the biennium 2021-2022. Eight out of nine countries had endorsed the biennial workplan for implementation of the RAP MALI and the Regional Guidance on Harmonized Marine Litter Monitoring Programmes and provided valuable comments on the Terms of Reference of the East Asian Seas Regional Node of the GPML. These documents would be adopted by silence procedure to allow for any final comments. Similarly, the COBSEA workplan and budget for the biennium would be revised further based on comments received and considered for adoption by silence procedure. Following the Meeting, the Secretariat would circulate presentations and meeting documents for review and adoption within two weeks of receipt. The Meeting report and resolution for part one of IGM 25 would be shared for review and adoption accordingly.

115. The Chair invited Ms. Kerstin Stendahl, Head of the Ecosystems Integration Branch, UNEP, to give closing remarks on behalf of UNEP.

116. Ms. Stendahl extended her thanks and congratulations to all the participants for a successful Meeting and encouraged all delegated to continue their active engagement in the weeks following the Meeting to finalize and adopt documents. She expressed UNEP's continued support to COBSEA countries in the protection of their marine and coastal environments and congratulated Viet Nam for chairing the Meeting.

117. The Chair expressed his sincere thanks to all participating countries for the constructive Meeting and thanked UNEP and the COBSEA Secretariat for their support. On behalf of Viet Nam and the Ministry of Natural Resources and Environment, the Chair stated that he was honoured to have contributed to the success of part one of IGM 25 of COBSEA and reaffirmed Viet Nam's support, willingness to participate, and actively contribute to regional and global initiatives on plastic waste. He expressed his hope that COBSEA would continue to successfully discuss the application of the proposed solutions and recommendations in part two of IGM 25.

118. Upon completion of business of part one of the Meeting, the Chairperson declared the Twenty-fifth Intergovernmental Meeting adjourned on 9 September 2021, at 15.40 ICT (UTC +7).

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ANNEX 2 – AGENDA

1. **Opening of the Meeting**
   - 1.1 Welcome address and opening remarks
   - 1.2 Introduction of participants and acknowledgement of credentials

2. **Organization of the Meeting**
   - 2.1 Designation of officers
   - 2.2 Organization of work
   - 2.3 Adoption of the agenda

3. **Report of the Executive Director of the United Nations Environment Programme on the Implementation of COBSEA activities 2019-2020**

4. **COBSEA Regional Action Plan on Marine Litter**
   - 4.1 Update on current and planned marine litter projects and activities
   - 4.2 Biennial workplan for implementation of the COBSEA Regional Action Plan on Marine Litter
   - 4.3 Regional Guidance on Harmonized National Marine Litter Monitoring Programmes
   - 4.4 East Asian Seas Regional Node of the Global Partnership on Marine Litter

5. **Update on projects and activities in the context of the East Asian Seas Action Plan**
   - 5.1 Implementing the South China Sea Strategic Action Programme (SCS-SAP)
   - 5.2 Marine and coastal planning and management, nutrient pollution and biodiversity-related activities

6. **Workplan and budget for the biennium 2021-2022**
   - 6.1 Presentation of workplan and budget
   - 6.2 Process for resource mobilization and proposal of activities

7. **Date and venue for next Meeting**

8. **Any other business**

9. **Presentation of the draft Meeting report and process for adoption**

10. **Closing of the Meeting**

ANNEX 3 – RESOLUTION 1 OF THE TWENTY-FIFTH INTERGOVERNMENTAL MEETING OF COBSEA

The participating countries of the Coordinating Body on the Seas of East Asia (COBSEA), taking part in its Twenty-fifth Intergovernmental Meeting:

Thanking the Government of Viet Nam for hosting the Twenty-fifth Intergovernmental Meeting of COBSEA;

Recalling consultations with all participating countries prior to the Meeting and mutual consent to convene the Twenty-fifth Intergovernmental Meeting in two parts in light of the current COVID-19 pandemic, with the first part held virtually on 8-9 September 2021 to take decisions on urgent matters;

Bearing in mind the COBSEA Strategic Directions 2018-2022, which identifies addressing marine pollution, promoting marine and coastal planning and management, as well as ensuring sound governance, resource mobilization and partnerships, as regional priorities;

Noting the 2019 COBSEA Regional Action Plan on Marine Litter (RAP MALI), which aims to prevent and reduce marine litter from land-based and sea-based sources, to strengthen monitoring and assessment for evidence-based action, and create an enabling environment for implementation of the RAP MALI;

Noting further the establishment of the Working Group on Marine Litter (WGML) by the Twenty-fourth Intergovernmental Meeting of COBSEA to guide the Intergovernmental Meeting and Secretariat in implementation of the RAP MALI;

Recalling the resolution adopted by the Twenty-fourth Intergovernmental Meeting of COBSEA, requesting the Secretariat, in consultation with the WGML, to develop projects to achieve the RAP MALI, to develop a biennial workplan for implementation of the RAP MALI, and to develop the East Asian Seas Regional Node of the Global Partnership on Marine Litter (GPML), for consideration by the Twenty-fifth Intergovernmental Meeting of COBSEA;

Recognizing the need to strengthen COBSEA's financial sustainability through the Trust Fund and extrabudgetary funding sources to ensure effective operation and implementation of the East Asian Seas Action Plan;

Recognizing further the need to strengthen the of role of COBSEA and Secretariat capacity to improve coordination functions and enable effective support to participating countries to address regional challenges and priorities for the protection of the marine and coastal environment;

1. *Approve* the biennial workplan for implementation of the Regional Action Plan on Marine Litter 2021-2022 as contained in Appendix 1 to this resolution and request the Secretariat, in consultation with the WGML, to implement activities of the workplan and further develop projects and mobilize resources to this end;

2. *Adopt* the Terms of Reference of the East Asian Seas Regional Node of the GPML as contained in Appendix 2 to this resolution and request the Secretariat to support hosting of the Regional Node in the interim and coordinate with the Regional Capacity Centre for Clean Seas (RC3S) and the Steering Committee of the GPML toward establishing the Regional Node and developing sustainable hosting and funding arrangements;

3. *Adopt* the Regional Guidance on Harmonized National Marine Litter Monitoring Programmes as contained in Appendix 3 to this resolution and encourage the Secretariat to provide technical assistance toward

strengthening national marine litter monitoring programmes with support from the Expert Group on Monitoring of the WGML, and to support further harmonization of monitoring approaches at regional and global level;

4. *Approve* the COBSEA workplan and budget for the biennium 2021-2022 as contained in Appendix 4 to this resolution and encourage the Secretariat to further pursue resource mobilization and strengthen Secretariat capacity to ensure effective operation of COBSEA and implementation of activities;

5. *Welcome* the Government of Viet Nam's invitation to host part two of the Twenty-fifth Intergovernmental Meeting of COBSEA in-person in Viet Nam as soon as possible in 2022.

Appendix 1 - Biennial workplan for implementation of the Regional Action Plan on Marine Litter 2021-2022

I. Background

1. The Coordinating Body on the Seas of East Asia (COBSEA) Regional Action Plan on Marine Litter (RAP MALI) was adopted by the Twenty-fourth Intergovernmental Meeting of COBSEA (IGM 24). Paragraph 15 of RAP MALI states that the Regional Action Plan is complemented by more specific biennial rolling workplans developed through the COBSEA Working Group on Marine Litter (WGML) and adopted by the Intergovernmental Meeting. The biennial workplans form the basis for assessing progress on implementation of the RAP MALI and enable an adaptive approach, strengthening progress on priority issues, ensuring responsiveness to global-level developments such as United Nations Environment Assembly (UNEA) resolutions, and reducing risk for duplication of effort. Descriptions of key actions in RAP MALI Appendix 2 serve as a guide for development of activities in the rolling workplans (see Annex 1).

2. The Twenty-fourth Intergovernmental Meeting of COBSEA requested the Secretariat, in consultation with the WGML, to develop projects to support implementation of the COBSEA RAP MALI and, upon request and subject to availability of funds, develop relevant national activities in participating countries. Identified project and funding opportunities were presented at the Third Meeting of the COBSEA WGML on 29-30 June and received support from participating countries. An overview of ongoing and pipeline projects and activities is contained in UNEP/COBSEA IGM 25/4.

3. A draft workplan format and initial content was prepared by the COBSEA Secretariat pursuant to paragraph 15 of the RAP MALI and was discussed by the COBSEA WGML at the technical consultation from 23-25 June 2020. An updated draft based on inputs provided during the consultation was shared with WGML focal points for further comment following the consultation.

4. At the Third Meeting of the COBSEA WGML on 29-30 June 2021, the Secretariat presented the revised draft biennial workplan for implementation of the Regional Action Plan on Marine Litter, including identification of additional resources to support implementation of the RAP MALI, as contained in UNEP/COBSEA IGM 25/4. During the Meeting, participating countries provided further input and voiced support for the revised biennial workplan and recommended its consideration for adoption by the Twenty-fifth Intergovernmental Meeting on 8-9 September 2021. The document was revised further and finalized with input provided by and immediately following the Intergovernmental Meeting.

5. This document presents implementation progress against the RAP MALI by activity, identifies gaps and new funding opportunities, and proposes key priority actions for further development. Based on this assessment and recommendations provided by participating countries at the Third Meeting of the COBSEA WGML, the document contains the revised biennial workplan for implementation of the Regional Action Plan on Marine Litter 2021-2022 with emphasis on activities that are achievable and address regional priorities identified by COBSEA countries. Participating countries are requested to consider adoption of the revised biennial workplan by silence procedure following part one of the Twenty-fifth Intergovernmental Meeting of COBSEA.

II. Assessment of priority actions, progress and gaps in implementation of RAP MALI

Priority actions

6. Based on RAP MALI Appendix 2, bilateral consultations, guidance from the WGML, and existing initiatives, regional priority actions for implementation of the RAP MALI and further project development include:
   a. knowledge sharing on prevention and reduction of marine litter, including guidance and demonstration of good practices on integrated waste management and circular economy approaches;
   b. capacity building and technical assistance for harmonized national monitoring programmes, good governance and evidence-based planning;
   c. knowledge management and networking, including constituency engagement events, access to marine litter research, and development of the Regional Node;
   d. coordination of efforts at regional and global level with development partners and international organizations to avoid duplication and increase synergies.

Progress assessment

7. Since adoption of the RAP MALI, progress has been made toward planning and implementation of priority activities for collective action through COBSEA:

8. Under RAP MALI 'Action 1. Preventing and reducing marine litter from land-based sources' COBSEA Secretariat is working with United Nations Environment Programme (UNEP) Regional Office for Asia and the Pacific (ROAP) to develop knowledge products and case studies on preventing marine litter, including circular economy models and market-based instruments, through the joint SEA circular project. Project pilot activities to demonstrate integrated waste management are underway in Thailand and Malaysia. Good practice case studies and knowledge products are shared through the project website [1] and will be disseminated to WGML focal points in 2021 and 2022 for regional learning. The Annual Report 2019 of SEA circular with detailed information on activities and deliverables is attached in the Annex of working document UNEP/COBSEA IGM 25/4.

9. Under RAP MALI 'Action 2. Preventing and reducing marine litter from sea-based sources' Secretariat is collaborating closely with UNEP ROAP who are conducting a scoping study of legal frameworks relevant to addressing sea-based sources of marine litter in the East Asian Seas in coordination with the International Maritime Organization (IMO) and the Food and Agriculture Organization (FAO). The foundational study will identify existing frameworks and implementation gaps and will be shared with the WGML in November 2021 as a basis for development of further activities under the RAP MALI.

10. Under RAP MALI 'Action 3. Monitoring and assessment of marine litter' Secretariat is working in partnership with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to harmonize and strengthen marine litter monitoring and assessment with guidance by the WGML, funded through the SEA circular project. An inventory of existing marine litter monitoring efforts was compiled with input from COBSEA countries and Regional Guidance on Harmonized National Marine Litter Monitoring Programmes has been drafted for further discussion and consideration by IGM 25. Training modules have been developed

[1] www.sea-circular.org

in coordination with the Global Partnership on Marine Litter (GPML) to deliver national trainings on monitoring and assessment based on country needs and regional guidance.

11. Under RAP MALI 'Action 4. Activities supporting the implementation of COBSEA RAP MALI' Secretariat is strengthening coordination with relevant regional and global entities to promote knowledge sharing on marine litter, align efforts and avoid duplication, including the Association of Southeast Asian Nations (ASEAN) and Basel Convention Plastic Waste Partnership. Through the SEA circular project, Secretariat is providing technical assistance for development and implementation of National Action Plans on Marine Litter or equivalent planning or policy documents, including in Malaysia, Thailand, Cambodia, and Viet Nam. SEA circular project has mapped existing campaigns on plastic pollution in the region and is developing a regional campaign linked to CleanSeas to engage various stakeholders including local authorities, civil society, youth and private sector in prevention of marine litter. In collaboration with UNEP, GPML and regional partners, Secretariat has convened two regional events to share solutions and foster partnerships on plastic pollution prevention through the SEA circular project. The first annual SEA of Solutions was held in Bangkok, Thailand, on 11-14 November 2019, with over 500 participants and the second SEA of Solutions was held as hybrid event co-hosted by the Government of Viet Nam on 24-26 November 2020 with around 800 participants.

12. Further under RAP MALI Action 4, Secretariat has made progress toward developing the services and functions of the East Asian Seas Regional Node of the GPML through the SEA circular project, with guidance from WGML and in collaboration with regional partners, including the Regional Capacity Center for Clean Seas (RC3S) and National University of Singapore (NUS). Terms of Reference have been further developed by WGML at its Third Meeting and recommended for adoption by IGM 25 (UNEP/COBSEA IGM 25/7). The Regional Node will provide knowledge management and networking services on marine litter policy, science and capacity building toward delivery of the RAP MALI linked to the Global Digital Platform on Marine Litter. Jointly with NUS, Secretariat launched a database of marine litter research from 13 Asian countries in August 2020 and conducted a review of plastic pollution research, policies, and initiatives in ASEAN+3. Secretariat is working with NUS to expand the plastic pollution research database and develop a regional research network for integration in the Regional Node.

Gaps and opportunities for further development

13. Based on progress assessment of existing activities, potential gaps are identified that require further development of initiatives and funding toward achieving the RAP MALI. Currently, COBSEA is partially delivering on RAP MALI Actions 1, 3 and 4 and providing support to the Secretariat and WGML through the SEA circular project which ends in December 2022. No dedicated COBSEA activities have been conducted to address RAP MALI Action 2 on sea-based sources. To accelerate delivery against the four actions in RAP MALI, additional efforts for inclusion in the biennial workplan were identified at the Third Meeting of the COBSEA WGML, including to:
    a. strengthen knowledge sharing on good practices of improved waste management and circular economy approaches, including support for additional pilot sites for replication;
    b. continue national and regional training and technical assistance to enhance marine litter monitoring with a view to assessing regional status and trends;
    c. intensify regional knowledge management and networking through development of the Regional Node and organization of regional events in collaboration with partners;
    d. address existing marine litter in the environment as relevant and strengthen legal and economic instruments to prevent and reduce marine litter from sea-based sources.

14. In response to the resolution of IGM 24, Secretariat has identified and further developed proposed activities and funding opportunities to support implementation of the RAP MALI and to strengthen COBSEA

Secretariat capacity respectively, without utilizing Trust Fund resources. Planned activities that leverage additional resources build on and complement existing project activities, respond to country needs and regional priorities, and are wholly aligned with key actions in RAP MALI Appendix 2. Initiatives and funding sources to address regional priorities and remaining gaps toward implementation of RAP MALI are captured in the revised biennial workplan as per guidance of the WGML at its Third Meeting.

15. Additional resources identified to achieve priority activities under RAP MALI Action 1 include national legislative guidance provided by UNEP with funding through the GPML to assist COBSEA countries to enhance and implement legal instruments on marine litter, based on Expressions of Interest. Further, funding under the United States Environmental Protection Agency (USEPA) and UNEP 'Cooperation on Global Environmental Programs' umbrella agreement is available for additional pilot sites in East Asian Seas countries to demonstrate integrated waste management, including in island and remote communities. The Third Meeting of COBSEA WGML voiced support for replication of good practices and identification of pilot locations in the East Asian Seas region.

16. As a foundation for development of activities on sea-based sources under RAP MALI Action 2, support is provided by UNEP to map existing frameworks and implementation gaps relevant to addressing marine litter from sea-based sources in the East Asian Seas. The foundational scoping study is led by UNEP in close coordination with COBSEA Secretariat and in collaboration with IMO and FAO. The study will identify gaps and potential areas for COBSEA support for discussion through the WGML. The Third Meeting of COBSEA WGML recommended inclusion of additional efforts in the biennial workplan to address abandoned, lost and otherwise discarded fishing gear (ALDFG) in the environment.

17. Additional funding for priority actions and staff capacity on marine litter in the Secretariat, has been identified under the Zukunft – Umwelt – Gesellschaft (ZUG)[2] initiative supported by the Government of Germany through the MA-RE-DESIGN project led by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)[3]. The project aims to reduce plastic waste leakage by reducing and better managing plastic waste with a focus on Thailand. At national level, the project focuses on plastic packaging strategies and enhanced waste management, included through Extended Producer Responsibility (EPR) schemes. The project aims to leverage COBSEA mechanisms to foster knowledge sharing at regional level and replicate good practices. The Third Meeting of COBSEA WGML voiced support to pursue this funding opportunity to strengthen replication of good practices and capacity building related to circular economy approaches to prevent plastic pollution.
    The project will run from January 2022 to December 2024 and will support:
    e. compilation and showcasing of good practices on sustainable packaging, EPR, plastic waste management, and monitoring and assessment, under RAP MALI Action 1;
    f. capacity building and technical assistance on monitoring and assessment under RAP MALI Action 3;
    g. organization of regional constituency engagement events such as SEA of Solutions beyond the end of the SEA circular project, development and maintenance of services and infrastructure of the Regional Node in collaboration with Node host(s), as well as development of regional sectoral guidelines on the prevention and reduction of marine litter from sectors of waste management, tourism and plastic manufacturing under RAP MALI Action 4.

18. Further additional funding for regional knowledge management through the Regional Node and knowledge sharing events under RAP MALI Action 4 has been identified through the Asian Development Bank (ADB)

[2] Zukunft – Umwelt – Gesellschaft (ZUG) gGmbH is a federally-owned, non-profit company founded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU).

[3] GIZ is the German Agency for International Cooperation.

project 'Promoting Resource Efficiency and Circularity to Reduce Plastic Pollution for Asia and the Pacific' supported by the Global Environment Facility (GEF). The project aims to create enabling conditions for governments and relevant stakeholders to promote actions to reduce plastic pollution from source to sea in the region, with a focus on national-level activities in the Philippines, Indonesia, Thailand and Viet Nam. The project will run from October 2021 to September 2024 and aims to leverage COBSEA to facilitate regional knowledge management, including dissemination of knowledge products on finance and digital technologies, outreach on project findings, and organizing regional events with site visits to project demonstration sites. Project target countries and the Third Meeting of COBSEA WGML voiced support to pursue this funding opportunity to strengthen regional knowledge management and development of the Regional Node.

19. Additional information on ongoing and planned project development, funding sources and amounts, is provided in UNEP/COBSEA IGM 25/4.

III. Revised biennial workplan 2021-22 for implementation of RAP MALI

1. The workplan format is structured along the four main actions of the COBSEA Regional Action Plan on Marine Litter (RAP MALI) and corresponds to the list of key actions contained in Appendix 2 of RAP MALI, as suggested in the resolution of IGM 24. RAP MALI Appendix 2 is attached as Annex 1 for easy reference. The draft biennial workplan is presented below and further attached in spreadsheet format in Annex 2.

2. The workplan identifies specific activities and where relevant deliverables; the roles of the WGML, countries and Secretariat and other partners as appropriate; identified funding sources, including existing and pipeline funding for the biennium; timeframe for implementation of activities; and status of implementation. The workplan focuses on activities COBSEA participating countries will collectively pursue because they are regional in nature or require coherent national efforts. At the national level, countries may further develop activities to address national priorities and needs, and report on such efforts through the WGML. The revised draft biennial workplan includes ongoing activities and planned activities for 2021-2022, that are achievable using existing resources or where additional funding sources have been identified to provide adequate capacity for implementation of the RAP MALI.

3. The draft workplan format enables tracking of progress to the WGML by the Secretariat on a quarterly basis, and to inform progress reports developed by the WGML for approval by the Intergovernmental Meeting, as per Terms of Reference of the WGML. The workplan enables continuous tracking of activities from 'not started' (implementation not started, planning may be underway); 'initiated' (initial steps taken to plan implementation, implementing modality/partner identified); 'underway' (activity ongoing, agreement or similar signed, significant progress made); 'advanced' (activity nearing completion, advanced delivery of outputs); to 'completed' (activity completed, deliverables finalized).

4. The WGML may recommend a revision or adjustment of the biennial workplan in due course to reflect any relevant developments at regional or global level, such as any decisions adopted by the resumed Fifth Session of the United Nations Environment Assembly (UNEA-5.2), as needed, for approval by the COBSEA Intergovernmental Meeting, in line with the Working Group's mandate.

5. Participating countries are requested to consider for adoption the revised biennial workplan by silence procedure following part one of the Twenty-fifth Intergovernmental Meeting of COBSEA, including identified activities and funding sources, to enable implementation of the RAP MALI and ensure sustainable

funding for efficient operation of the Secretariat. The biennial workplan will provide the basis for regular progress assessment and for proposal of additional and complementary activities to address remaining gaps.

Revised biennial workplan 2021-2022 for implementation of the RAP MALI

# Activity	Lead entities and roles	Funding source	Timeframe								Status of implementation (as of October 2021)
			2021				2022				
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
ACTION 1. PREVENTING AND REDUCING MARINE LITTER FROM LAND-BASED SOURCES											
1.1 Legal and economic instruments											
Encourage and assist countries to enhance leadership, implementation and quality of government efforts	UNEP and GPML provide national legislative guidance in coordination with Secretariat and WGML	UNEP, GPML									Initiated
Encourage and assist countries to develop legal and economic instruments to manage and prevent marine litter, by sharing knowledge products and case studies, including on circular economy models, addressing single-use products, deposit refund schemes	Secretariat coordinates with UNEP and partners to disseminate guidance and lessons learned to WGML focal points; WGML recommends further action	SEA circular project, GPML, ZUG GIZ									Underway
1.2 Integrated waste management											
Conduct pilot activities to demonstrate integrated waste management and share good practices for replication at regional level, including measures to reduce waste and illegal dumping, improve collection and recycling, engage the informal waste sector and local communities, and addressing riverine flows of marine litter	Secretariat identifies good practices for replication, coordinates pilot activities and shares good practices with WGML; WGML identifies recommended sites										
- in pilot sites in Thailand and Malaysia		SEA circular project									Underway
- in 3-4 additional pilot sites in EAS		USEPA-UNEP									Initiated
1.3 Removal of existing litter and its disposal											

#	Activity	Lead entities and roles	Funding source	Timeframe								Status of implementation
				2021				2022				
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	*(as of October 2021)*
ACTION 2. PREVENTING AND REDUCING MARINE LITTER FROM SEA-BASED SOURCES												
2.1	**Legal and economic instruments**											
	Review existing legal frameworks relevant to addressing marine litter from sea-based sources in the East Asian Seas, in collaboration with the International Maritime Organization (IMO) and the Food and Agriculture Organization (FAO), as a basis for development of further activities	UNEP conducts mapping of existing frameworks and implementation gaps in coordination with Secretariat and WGML; WGML recommends development of further activities	UNEP, GPML									Initiated
2.2	**Removal of existing marine litter and its disposal**											
	Explore pilot activities and replication of good practices related to recovery and recycling of fishing gear and, as relevant, assessment of impacts on coastal environment, in collaboration with partners such as FAO	Secretariat identifies good practices for replication and coordinates with relevant partners to identify support for COBSEA countries; WGML recommends development of further activities	no initial funding needed, additional funding to be identified as relevant									Not started
ACTION 3. MONITORING AND ASSESSMENT OF MARINE LITTER												
3.1	**Expert Group**											

Establish a Marine Litter Monitoring Expert Group under the WGML towards development and implementation of harmonized national marine litter monitoring programmes	WGML establishes the Expert Group of the WGML; Secretariat invites NFPs to nominate experts to Expert Group	no funding needed										Advanced
#	**Activity**	**Lead entities and roles**	**Funding source**	**Timeframe**								**Status of implementation** *(as of October 2021)*
				2021				**2022**				
				Q1	**Q2**	**Q1**	**Q2**	**Q1**	**Q2**	**Q1**	**Q2**	
3.2	**Regional and National Marine Litter Monitoring Programmes**											
	Prepare regional guidance on the development of harmonized National Marine Litter Monitoring Programmes, in line with globally established guidelines, including a regional inventory of existing marine litter monitoring efforts	Secretariat coordinates drafting of guidance with support from regional experts (CSIRO); WGML provides input and identifies further activities; for consideration by IGM 25	SEA circular project									Advanced
	Deliver national trainings on monitoring and assessment based on country needs, and regional training on harmonizing monitoring programmes, in line with regional guidance	Secretariat conducts capacity building in collaboration with GPML and regional experts, in consultation with WGML	SEA circular project, GPML, ZUG GIZ									Initiated
	Technical assistance to develop and implement national marine litter monitoring programmes, based on respective national policies, approaches and circumstances, and regional guidance	Secretariat provides technical assistance in collaboration with regional experts; WGML shares lessons learned	SEA circular project									Underway

Identify need and scope for the preparation of a regional report to assess regional status and trends on marine litter, based on national marine litter monitoring efforts	WGML provides guidance on objectives and process; Secretariat coordinates planning	SEA circular project									Initiated
# Activity	**Lead entities and roles**	**Funding source**	**Timeframe**								**Status of implementation** *(as of October 2021)*
			2021				**2022**				
			Q1	**Q2**	**Q1**	**Q2**	**Q1**	**Q2**	**Q1**	**Q2**	
ACTION 4. ACTIVITIES SUPPORTING THE IMPLEMENTATION OF COBSEA RAP MALI											
4.1 Regional and international cooperation and reporting											
Establish institutional cooperation with relevant global and regional entities in relation to implementation of RAP MALI and relevant global multilateral environmental agreements, including the Basel Convention	Secretariat engages in Basel Convention Plastic Waste Partnership, coordinates with Basel Convention Regional Centre to share good practices; WGML invites relevant entities as observers to meetings and explores partnerships/funding	no funding needed									Underway
Explore opportunities to strengthen coordination and align efforts between COBSEA and ASEAN, including knowledge sharing through COBSEA and ASEAN Working Groups	Secretariat communicates with ASEAN Secretariat and participates in ASEAN WG meetings; WGML provides guidance on aligning efforts	no funding needed									Initiated

Convene regional conferences for stakeholder engagement and partnerships and coordinate ongoing efforts, including annual SEA of Solutions partnership week on plastic pollution	Secretariat organizes event in collaboration with UNEP, partners and host countries; WGML suggests focus areas and promotes participation	SEA circular project, ZUG GIZ, GEF ADB									Underway

# Activity	Lead entities and roles	Funding source	Timeframe								Status of implementation *(as of October 2021)*
			2021				2022				
			Q1	Q2	Q1	Q2	Q1	Q2	Q1	Q2	
4.2 National planning and policy frameworks											
Technical assistance to develop and implement National Action Plans on Marine Litter or equivalent planning or policy documents to address marine litter	Secretariat provides technical assistance in collaboration with GPML and in coordination with regional partners; WGML shares lessons learned	SEA circular project, GPML									Underway
Develop regional sectoral guidelines on the prevention and reduction of marine litter from land-based sources, particularly for sectors of waste management, tourism and plastic manufacturing	Secretariat develops and shares report; WGML makes recommendations related to the workplan and/or the IGM based on findings	ZUG GIZ									Not started
Develop, at the regional level, a reporting format for national progress reporting on marine litter planning and policy frameworks	WGML reviews and finalizes draft format, for consideration by IGM 25; countries report progress to Secretariat for compilation	no funding needed									Underway

Compile existing marine litter policy and regulatory frameworks, initiatives and good practices on prevention and management of plastic pollution in the region to support national and regional policy development and implementation for integration in the Regional Node	Secretariat supports development of policy-related knowledge management of the Regional Node with regional partners and Node host(s); WGML develops ToR of the Regional Node for consideration by IGM 25	SEA circular project, GPML, ZUG GIZ, GEF ADB							Underway

# Activity	Lead entities and roles	Funding source	Timeframe								Status of implementation *(as of October 2021)*
			2021				2022				
			Q1	Q2	Q1	Q2	Q1	Q2	Q1	Q2	
4.3 Research activities											
Support research to prevent marine litter, including consideration of social and behavioural sciences, impacts on coastal environment and economy, through establishment of a regional research network and plastic pollution research database as part of the EAS Regional Node of the GPML	Secretariat supports development of science-related knowledge management of the Regional Node with regional partners and Node host(s); WGML develops ToR of the Regional Node for consideration by IGM 25	SEA circular project, GPML, ZUG GIZ, GEF ADB									Underway
Undertake marine litter flow modelling in the region and conduct analysis of plastic pollution sources, flows and accumulation in COBSEA countries	Secretariat coordinates analysis with regional experts and GPML, in consultation with WGML	SEA circular project, GPML									Underway
4.4 Information, education, outreach and involvement of stakeholders											

Map existing campaigns in the region and develop regional campaign linked to CleanSeas to engage various stakeholders including local authorities, civil society, youth and private sector in prevention of marine litter	Secretariat coordinates campaign efforts in collaboration with UNEP, in consultation with WGML	SEA circular project									Underway
Based on request by participating countries, develop suitable information material on the COBSEA Regional Action Plan on Marine Litter and translate it into national languages	Secretariat develops outreach material, in consultation with WGML	SEA circular project, GPML									Not started

# Activity	Lead entities and roles	Funding source	Timeframe								Status of implementation *(as of October 2021)*
			2021				2022				
			Q1	Q2	Q1	Q2	Q1	Q2	Q1	Q2	
4.5 Training and capacity building											
Develop relevant training courses/modules on marine litter and strengthen utility to the region of the UNEP Massive Open Online Course on Marine Litter, including translation into national languages and case studies from the region	Secretariat develops and translates content in collaboration with UNEP; WGML identifies case studies and encourages participation of national stakeholders	SEA circular project, ZUG GIZ									Initiated
Design and develop marine litter capacity building services of the EAS Regional Node of the GPML, including a catalogue of regional capacity building activities/resources and a registry of experts	Secretariat coordinates development of capacity building services of the Node with regional partners and Node host(s) such as RC3S; WGML develops ToR of the Regional Node for consideration by IGM 25	SEA circular project, GPML, ZUG GIZ, GEF ADB									Initiated

Annex 1. Appendix 2 of RAP MALI: Detailed description of actions

Appendix 2 encompasses further detailed description of key actions and serves as a guide for the COBSEA Working Group on Marine Litter's deliberations in developing specific activities that will be further elaborated in rolling work plans for implementation of the COBSEA Regional Action Plan on Marine Litter. The rolling work plans will also form the basis for assessing progress on implementation of the COBSEA Regional Action Plan on Marine Litter. It is considered that, at present, these actions will cover appropriately and feasibly the challenge of marine litter management in the region. Initial prioritization of actions identifies where countries will collectively pursue more specific activities through COBSEA, within its mandate, competence and comparative advantage, in line with the East Asian Seas Action Plan and the COBSEA Strategic Directions 2018-2022. Countries may, at the national level, further prioritize actions and develop activities, based on national priorities and need.

Key Actions		**Lead Authority**
Action 1. Preventing and reducing marine litter from land-based sources		
1.1. Legal and economic instruments		
	1.1.1. Encourage and assist countries to enhance leadership, implementation and quality of government efforts.	Secretariat
	1.1.2. In countries where many government agencies and departments are involved in waste management efforts, COBSEA members may wish to consider, as necessary, establishing a policy making mechanism and supporting agency, or strengthening it if already existing, for the implementation of solid waste management policies.	Countries
	1.1.3. Encourage and assist countries to develop and adopt legal and economic instruments to assist the management and prevention of marine litter from land-based sources and moving towards circular economy models, including harmonization of standards and regulations in the region. This could include: - addressing single-use product consumption (through, for example, fiscal and economic instruments such as a tax on plastic bags and packaging and phase out of single-use plastic items in stores); - establishment and/or further development of deposit refund systems for bottles, containers and cans (e.g. glass, plastics and aluminium).	Secretariat /Countries
1.2. Integrated waste management		
	1.2.1. Enter into dialogue with the industry on waste management practices that impact on the marine environment and identify incentives/measures to promote sustainable practices.	Secretariat /Countries
	1.2.2. Implement adequate waste reduction, reuse and recycling measures, as well as other relevant approaches such as product replacement, in order to reduce the amount of litter, particularly the fraction of plastic waste that goes to landfill or incineration without energy recovery. Where incineration with energy recovery is used, this should use modern technology with controls on combustion condition capable of meeting stringent emission standards.	Countries
	1.2.3. Organize the front and middle end of the waste system by building a modern waste collection and separation system, including recognizing and integrating waste pickers in formal systems of waste management and accelerating recycling, while ensuring non-processed waste is disposed of safely in sanitary landfills at the back of the chain.	Countries
	1.2.4. Take the necessary measures to address illegal dumping, including closing existing illegal dump sites on land and strengthening enforcement measures to combat illegal dumping, such as littering on the beach and illegal solid waste or sewage disposal in the coastal zone and rivers, in accordance with national legislation.	Countries

Key Actions		Lead Authority
	1.2.5. Seek cooperation with River Authorities, if necessary, municipalities and other relevant authorities in order to address impacts of litter on the marine environment from riverine inputs, including through introduction and improvement of trash traps at river and drainage areas, floating booms and barriers.	Secretariat /Countries
1.3. Removal of existing litter and its disposal		
	1.3.1. Develop and implement, in collaboration with relevant stakeholders, programmes and initiatives for identification, removal and sound disposal of accumulations of land-based marine litter, e.g. in combination with existing efforts such as coastal clean-up activities, where economically feasible and ecologically advantageous.	Secretariat /Countries
Action 2. Preventing and reducing marine litter from sea-based sources		
2.1. Legal and economic instruments		
	2.1.1. Encourage and assist countries to develop and adopt legal and economic instruments, which are consistent with the relevant international instruments such as the United Nations Convention on the Law of the Sea (UNCLOS) and the International Convention for the Prevention of Pollution from Ships (MARPOL) and its Annexes, to assist the management and prevention of marine litter from sea-based sources.	Secretariat /Countries
	2.1.2. Reinforce the implementation and enforcement of existing national legal instruments in compliance with marine litter related international conventions and agreements such as the MARPOL convention and its Annex V, the London convention and its Protocol, the Basel Convention, and the Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries.	Countries
	2.1.3. Provide assistance in the implementation of the requirements of Annex V to the MARPOL Convention to provide and improve reception facilities for all types of ship-generated waste in ports, harbours, terminals and marinas.	Secretariat
	2.1.4. Develop sectoral guidelines on the prevention and reduction of marine litter from sea-based sources, particularly for fisheries and marine/coastal tourism.	Secretariat
	2.1.5. Develop and/or strengthen existing legislation requiring all fishing gear to be identified/marked in order to contribute to reducing fisheries-related marine litter.	Secretariat /Countries
2.2. Removal of existing marine litter and its disposal		
	2.2.1. Develop and implement, in collaboration with relevant stakeholders, programmes and initiatives to locate, remove and dispose of accumulations of sea-based marine litter, where economically feasible and ecologically advantageous.	Secretariat /Countries
Action 3. Monitoring and assessment of marine litter *(note: specifically for this section, the proposed activities are to be viewed as a step-by-step approach, in numerical order, towards exploring the development of a regional marine litter and microplastics monitoring meta-database/portal)*		
3.1. Expert Group		
	3.1.1. Establish a Marine Litter Monitoring Expert Group under the COBSEA Working Group on Marine Litter.	Secretariat
3.2. Regional and National Marine Litter Monitoring Programmes		

Key Actions		Lead Authority
	3.2.1. Prepare regional guidance on the development of harmonized National Marine Litter and Microplastic Monitoring Programmes, in line with globally established guidelines, e.g. Group of Experts on the Scientific Aspects of Marine Environmental Protection Working Group on plastics and microplastics in the ocean (GESAMP WG 40) Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean, and in consultation with relevant ongoing regional monitoring programmes.	Secretariat
	3.2.2. Conduct regional training on the development and implementation of harmonized National Marine Litter and Microplastic Monitoring Programmes, also addressing associated data management needs and reporting.	Secretariat
	3.2.3. Work towards developing and implementing National Marine Litter and Microplastic Monitoring Programmes, based on respective national policies, approaches and circumstances.	Countries
	3.2.4. Prepare regional reports on marine litter and microplastic and delivery against Sustainable Development Goal target 14.1, and other relevant Goals and targets, based on National Marine Litter and Microplastic Monitoring Programmes.	Secretariat
	3.2.5. Explore development of a regional marine litter and microplastic monitoring meta-database/portal, as appropriate building on available global infrastructure, to facilitate the preparation of periodic regional reports.	Secretariat
Action 4. Activities supporting the implementation of COBSEA RAP MALI		
4.1. Regional and international cooperation and reporting		
	4.1.1. Establish a COBSEA Working Group on Marine Litter, to include national focal points and experts. This group will promote implementation of the COBSEA Regional Action Plan on Marine Litter, advising and assisting the COBSEA Intergovernmental Meeting and the COBSEA Secretariat. Terms of Reference for the group is provided in Appendix 3 of RAP MALI.	Secretariat
	4.1.2. Establish institutional cooperation with relevant global and regional entities in relation to implementation of the COBSEA Regional Action Plan on Marine Litter and relevant global multilateral environmental agreements, e.g. the MARPOL Convention and its Annex V, the London Convention and its Protocol, the Basel Convention, the Convention on Biological Diversity, Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) as well as the FAO Code of Conduct for Responsible Fisheries and Voluntary Guidelines on Gear Marking.	Secretariat
	4.1.3. Establish partnerships with cities, to provide effective transfer of knowledge and innovation, and promote collaboration between cities/countries.	Secretariat /Countries
	4.1.4. Convene regional conferences for stakeholder engagement and partnerships and coordinate ongoing efforts with relevant regional and international partners and frameworks, such as the Association of Southeast Asian Nations (ASEAN).	Secretariat
4.2. National planning and policy frameworks		
	4.2.1. Develop and implement National Action Plans on Marine Litter or equivalent planning or policy documents (where relevant building on existing efforts such as development of or updating GPA national programmes of action to strengthen the management and mitigation of land-based pollution), or similar initiatives that contribute to addressing land-based and sea-based sources of pollution.	Countries
	4.2.2. Develop regional sectoral guidelines on the prevention and reduction of marine litter from land-based sources, particularly for sectors of waste management, tourism and plastic manufacturing.	Secretariat
	4.2.3. Develop, at the regional level, a reporting format on national planning and policy frameworks.	Secretariat

Key Actions		Lead Authority
4.3. Research activities		
	4.3.1. Support research and development including of technology and approaches, as well as the consideration of social and behavioural sciences, to prevent marine litter input from land-based sources and promote environmentally sound production and waste management technologies.	Secretariat /Countries
	4.3.2. Develop and carry out research on the impact of marine litter on the marine and coastal environment and economy (including economic costs and impacts on human health and safety).	Secretariat /Countries
	4.3.3. Develop and support research on the effectiveness of market-based instruments related to marine litter.	Secretariat /Countries
	4.3.4. Undertake marine litter trajectory modelling in the COBSEA region, to identify sources and accumulation zones for marine litter. Such models will assist participating countries in tracking progress towards Sustainable Development Goal target 14.1.	Secretariat /Countries
	4.3.5. COBSEA participating countries to consider undertaking analysis of plastic flows into the region and their relative contribution to marine litter generation.	Countries
4.4. Information, education, outreach and involvement of stakeholders		
	4.4.1. Encourage and assist the appropriate involvement of various stakeholders including local authorities, civil society and private sector in implementation of the COBSEA Regional Action Plan on Marine Litter.	Secretariat /Countries
	4.4.2. Support the implementation of marine litter clean-up campaigns on a regular basis, including: - organization of clean-ups as a tool in educating and involving local stakeholders, communities and media, in combination with public awareness campaigns; - encouraging and assisting entities with a particular interest in or responsibility for certain coastal areas, such as tourist resorts and port authorities, to undertake regular clean-ups; - encouraging stakeholder engagement in relevant international initiatives, such as the International Coastal Cleanup (ICC) campaigns, Clean Up the World (CUW) campaigns, Green Fins, Project Aware and similar campaigns or programmes.	Secretariat /Countries
	4.4.3. Formulate and implement awareness raising campaigns and activities, in line with the Clean Seas campaign and other relevant campaigns, for the general public, various sectors, municipal authorities, local communities and particularly vulnerable groups, school children and youth and other groups.	Secretariat /Countries
	4.4.4. Develop suitable information material on the COBSEA Regional Action Plan on Marine Litter and translate it into national languages.	Secretariat
4.5. Training and capacity building		
	4.5.1. Develop and implement regional education and training for different target groups (across sectors and stakeholder groups) to enhance understanding of marine litter generation pathways, impacts, and preventive action, and to facilitate the application of technical sectoral guidelines.	Secretariat
	4.5.2. Provide technical training and capacity building to staff from national and municipal governments, port authorities and the shipping industry on the prevention and reduction of marine litter from land-based and sea-based sources through regional workshops and training courses.	Secretariat

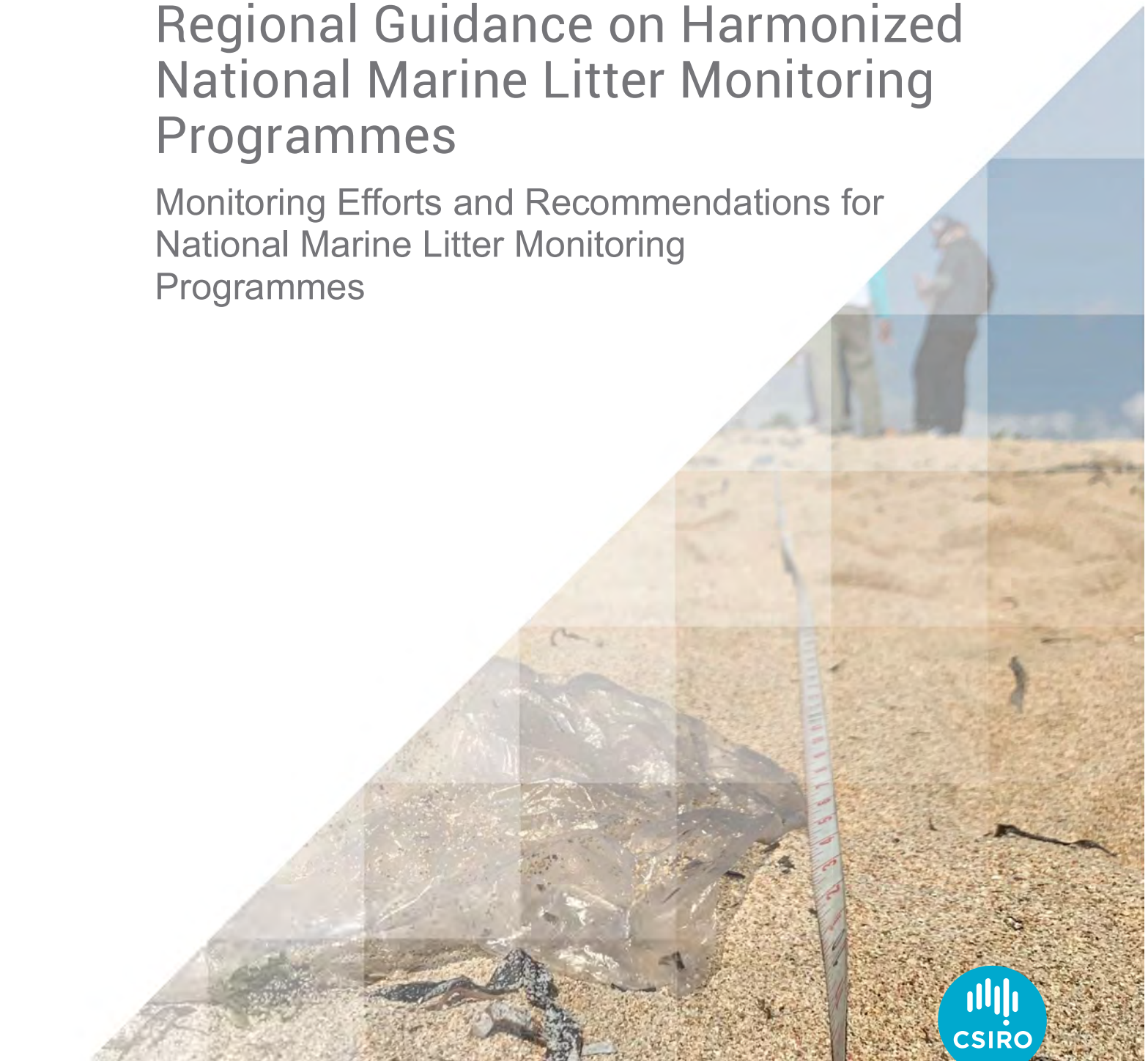
Appendix 2 - Regional Guidance on Harmonized National Marine Litter Monitoring Programmes

UN environment programme 50 1972-2022

COBSEA
COORDINATING BODY ON THE SEAS OF EAST ASIA

Regional Guidance on Harmonized National Marine Litter Monitoring Programmes

Monitoring Efforts and Recommendations for National Marine Litter Monitoring Programmes



CSIRO

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Disclaimer

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This document provides Regional Guidance on Harmonized National Marine Litter Monitoring Programmes to strengthen and harmonize marine litter monitoring efforts toward preventing and reducing marine litter and its impacts, in line with the COBSEA Regional Action Plan on Marine Litter (RAP MALI). The review responds to the needs identified by COBSEA participating countries, incorporates country contributions, and builds on existing capacities and priorities, to promote data comparability and align efforts at regional and global level. The document was prepared by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the COBSEA Secretariat, in close consultation with COBSEA participating countries and with guidance from the COBSEA Working Group on Marine Litter.

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The **Coordinating Body on the Seas of East Asia (COBSEA)** is a regional intergovernmental mechanism and one of 18 Regional Seas programmes. It is the decision-making body for the East Asian Seas Action Plan, bringing together nine countries – Cambodia, China, Indonesia, Republic of Korea, Malaysia, the Philippines, Thailand, Singapore and Viet Nam – in protection and sustainable development of the marine and coastal environment. COBSEA focuses on marine pollution, ecosystem-based marine and coastal planning and management, and ocean governance. The COBSEA Secretariat is hosted by Thailand in Bangkok and administered by UNEP Ecosystems Division in Nairobi.
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The **Commonwealth Scientific and Industrial Research Organisation (CSIRO)** is Australian Government's national science research agency responsible for scientific and industrial research. CSIRO aims to solve the greatest challenges using innovative science and technology by using science to solve real issues to unlock a better future for our community, our economy, our planet. From its headquarters in Canberra, CSIRO works with leading organizations around the world and maintains more than 50 sites across Australia and in France, Chile and the United States.
www.csiro.au

The **SEA circular** project – Reducing marine litter by addressing the management of the plastic value chain in South-East Asia is implemented by the United Nations Environment Programme (UNEP) Regional Office for Asia and the Pacific and the Coordinating Body on the Seas of East Asia (COBSEA), with support from the Government of Sweden. SEA circular aims to reduce and prevent plastic pollution and its impact by working with governments, businesses, civil society, academia, and international partners. The initiative promotes market-based solutions and enabling policies to transform plastic value-chain management, strengthens the science base for informed decision making, creates outreach and awareness. The project leverages COBSEA's regional mechanism to tackle the transboundary challenge of marine litter in a harmonized manner.
www.sea-circular.org | sea-circular@un.org

List of abbreviations

ALDFG - Abandoned Lost or otherwise Discarded Fishing Gear
ASEAN - Association of Southeast Asian Nations
BACI – Before-After-Control-Impact
COBSEA - Coordinating Body on the Seas of East Asia
CSIRO - The Commonwealth Scientific and Industrial Research Organisation
GESAMP - Group of Experts on the Scientific Aspects of Marine Environmental Protection
GLBP - Global Leakage Baseline Project
IOC-UNESCO - Intergovernmental Commission on Oceanography of the United Nations Educational, Scientific and Cultural Organization
ICC - International Coastal Clean-up
NGO - Non-government organization
MDMAP - Marine Debris Monitoring and Assessment Project (NOAA)
MSFD - Marine Strategy Framework Directive (European Union)
NOAA - National Oceanic and Atmospheric Administration (United States of America)
NOWPAP - Northwest Pacific Action Plan
OC ICC - The Ocean Conservancy's International Coastal Clean-up programme
OSEAN - Our Sea of East Asia Network
PA DAD - Project AWARE's Dive Against Debris programme
RAP MALI - Regional Action Plan on Marine Litter
UNEP - United Nations Environment Programme
WGML - COBSEA Working Group on Marine Litter

Contents

Background and rationale

1. MARINE LITTER MONITORING IN THE EAST ASIAN SEAS

Pollution of the world's oceans by plastic and other anthropogenic solid waste is a transboundary problem. Plastic production, and the consequent loss of plastic solid waste to the environment is growing through time (Lebreton and Andrady, 2019), which is reflected in the growing amount of 'marine litter', predominantly plastic, on the ocean's surface (Wilcox et al., 2020). The United Nations Environment Programme (UNEP) defines 'marine litter' as "… any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment". The focus of this review is on plastic marine litter, though the term maybe used interchangeably with 'marine debris' by some entities.

In 2016, more than 10% of the global production of plastic, approximately 19 to 23 million metric tons, was estimated to have entered aquatic ecosystems (Borrelle et al., 2020). Plastic in marine and aquatic environments is more than an eyesore. This waste negatively impacts wildlife health (Roman et al., 2019; Wilcox et al., 2018), poses a hazard to marine logistics and transport, and is potentially a human health issue (Wright and Kelly, 2017). Despite increasing global awareness of plastic pollution and rising multijurisdictional momentum seeking and effecting changes at local and national levels, there remain significant challenges to developing meaningful solutions at broader scales.

Mismanaged plastic waste is predicted to increase over the coming decades in quantities that far exceed the current mitigation efforts (Borrelle et al., 2020). Countries in Asia, in particular, are forecast to be disproportionate sources of this plastic waste entering the ocean through rivers in the coming years (Lebreton and Andrady, 2019) and had been previously identified as some of the top countries where plastic leaked to the marine environment (Jambeck et al. 2015). To address the risk that mismanaged plastic waste poses to coastal and marine systems, the first step is quantifying and understanding the nature of the pollution problem. Mismanaged waste in the marine environment is heterogeneous and transboundary by nature, driven by both socioeconomic and geographic factors (Hardesty et al. 2021). Quantifying and measuring the extent and change in this heterogeneous environmental problem is forefront to identifying plastic sources and sinks and implementing effective solutions. Instituting pollution monitoring programmes at regional scales is an important approach to solving the global plastic pollution crisis.

In 2019, the Twenty-fourth Intergovernmental Meeting of the Coordinating Body on the Seas of East Asia (COBSEA) revised and adopted the COBSEA Regional Action Plan on Marine Litter (RAP MALI). The RAP MALI guides coordinated action in the East Asian Seas region toward preventing and reducing marine litter from land-based sources (Action 1) and from sea-based sources (Action 2), strengthening monitoring and assessment of marine litter (Action 3), and creating enabling conditions for implementation (Action 4). The RAP MALI has the explicit objective to "improve monitoring and assessment of marine litter and its impacts for a science-based approach" (Objective 4).

The COBSEA RAP MALI recognizes that robust monitoring and assessment are indispensable in identifying marine litter status and trends and its most critical impacts, and to support development, tracking and evaluation of policy and management interventions. To improve knowledge on the main types, sources and amounts of litter that enter the marine and coastal environment in line with globally established guidelines, RAP MALI Appendix 2, key action 3.2.1. suggests to "prepare regional guidance on the development of harmonized National Marine Litter and Microplastic Monitoring Programmes, in line with globally established guidelines."

2. WHAT IS THE PURPOSE OF THIS DOCUMENT AND HOW WAS IT COMPILED?

COBSEA Regional Guidance on Harmonized National Marine Litter Monitoring Programmes directly addresses regional priorities collectively identified by COBSEA countries, responds to existing monitoring efforts and capacities in participating countries, was developed in a consultative process with contributions from participating countries, and considers the needs and context of individual countries. Recommendations provided are both regionally appropriate and in line with globally established guidelines, methods, and quality standards. The aim of this document is to strengthen national monitoring programmes building on existing capacities and priorities as identified in the RAP MALI, while promoting data comparability and aligning efforts at regional and global level. Greater harmonization of monitoring methods corresponds with discussions of the ad hoc open-ended expert group on marine litter and microplastics (AHEG) at its fourth meeting on 9-13 November 2020 (UNEP/AHEG/4/7). Developing regional-level guidance on harmonization provides targeted recommendations for application of global guidelines tailored to national and regional context and leverages existing regional mechanisms such as COBSEA to accelerate global progress on addressing the transboundary challenge of marine litter in a harmonized manner.

The COBSEA Working Group on Marine Litter (WGML) recognized that marine litter monitoring is being pursued based on nationally identified priorities and needs, and with consideration of national context. Harmonization of national marine litter monitoring programmes does not entail establishing identical monitoring programmes across all countries. Rather, harmonization and better data comparability can be pursued through definition of specific common objectives addressed through national monitoring programmes, as well as common core indicators, associated recommended methods and data standards identified and agreed at regional level International guidance is available to support such efforts, including the 2019 report of the Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) on 'Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean' (Kershaw et al., 2019) and similar efforts of Regional Seas programmes, such as the Northwest Pacific Action Plan (NOWPAP) 'Report on Implementation of the NOWPAP Regional Action Plan on Marine Litter in 2018-2019' (Plan, 2020).

The technical consultation of the COBSEA WGML on 23-25 June 2020 identified steps towards harmonized marine litter monitoring, in line with the RAP MALI:

- Inventorize existing marine litter monitoring efforts;
- Establish a Marine Litter Monitoring Expert Group under COBSEA WGML;
- Establish common objectives for marine litter monitoring in the context of COBSEA RAP MALI;
- Identify proposed common indicators, recommended methods and data standards; and
- Capacity building.

Accordingly, COBSEA partnered with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to map monitoring efforts in the region and prepare Regional Guidance on Harmonized National Marine Litter Monitoring Programmes in the East Asian Seas for discussion in the WGML and consideration by the Twenty-fifth Intergovernmental Meeting of COBSEA.

CSIRO and the COBSEA Secretariat also carried out a review of current (at the time of compiling) monitoring efforts in the region to highlight similarities and differences among approaches and a review of best practices and main recommendations from global guidelines, reports and peer-reviewed publications for science-based marine litter

monitoring, establishing baselines, and monitoring changes over time. A series of webinars were held in 2020 and 2021 to consult COBSEA participating countries, seek country input on existing monitoring efforts, and validate the regional inventory and identified recommendations. The Third Meeting of the WGML on 29-30 June 2021 finalized the Regional Guidance document and recommended it for adoption. The WGML further established an Expert Group on Monitoring to support implementation of Regional Guidance.

The Regional Guidance on Harmonized National Marine Litter Monitoring Programmes was adopted by the first part of the Twenty-fifth Intergovernmental Meeting of COBSEA by silence procedure on DATE 2021.

The document herein compiles and compares existing monitoring efforts in COBSEA participating countries (as provided by countries) and provides targeted recommendations for sound marine litter monitoring and toward regional harmonization. Recommendations focus on practical guidance to adapt current marine litter monitoring programmes and efforts and employ science-based best practice approaches for improved outcomes, following recognized guidelines of the GESAMP report (2019). This report is not intended as a top-down set of instructions to restructure national monitoring efforts, but rather a collaboration between participating countries seeking to make changes for improved outcomes toward regional harmonization of monitoring approaches.

This Regional Guidance acknowledges that national marine litter monitoring programmes are under different stages of development in the region and significant variation may exist in terms of indicators and methods used, depending on nationally identified priorities and capacities. Monitoring strategies serve different purposes and are tailored to different types of research questions relevant to national context. For example, some marine litter monitoring projects may seek to understand the impacts on wildlife, while others may be designed to monitor the effectiveness of policies under consideration or implementation or may aim to increase community awareness and engagement (or some combination therein). It is important to ensure that a monitoring programme meets targets or objectives identified by countries, and to acknowledge that those goals may change over time.

The RAP MALI recognizes the need for increasing coherence, coordination and synergies between existing mechanisms and to enhance cooperation and governance to better address marine litter at local, national, regional and global levels, including coordination across (sub)regional policy frameworks such as the Association of Southeast Asian Nations (ASEAN). Bearing in mind the large overlap in country composition of COBSEA and ASEAN, this guidance on harmonization can be leveraged to support national and regional efforts related to the ASEAN Framework of Action on Marine Debris, to reduce duplication and reporting burdens for countries.

This document includes:

- A review of marine litter survey and monitoring methodologies and good practices (Part I),

- A regional inventory of marine litter monitoring efforts underway in COBSEA countries, and organizations involved (Part II);
- A review of monitoring programmes to determine whether they follow a science-based approach and are likely to achieve national monitoring objectives (Part II);
- Recommendations to strengthen and harmonize existing monitoring methodologies and approaches to improve outputs (Part III).

Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) on 'Guidelines for the Monitoring and Assessment of Plastic Litter in the Ocean'

In 2019, the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection, a group of independent scientific experts that provides advice to the United Nations system on scientific aspects of marine environmental protection, tabled the "Guidelines for the monitoring and assessment of plastic litter in the ocean" or GESAMP report.

The principle purpose of the GESAMP report was to provide recommendations, advice, and practical guidance, for establishing programmes to monitor and assess the distribution and abundance of plastic litter, also referred to as plastic debris, in the ocean. It is a product of the GESAMP Working Group (WG40) on 'Sources, fate and effects of plastics and microplastics in the marine environment', co-led by the Intergovernmental Commission on Oceanography (IOC-UNESCO) and UNEP. The report was prepared by 19 independent experts from 14 countries, with financial support from a number of agencies and national governments.

The intention of the GESAMP report is to promote a more harmonized approach to the design of sampling programmes, the selection of appropriate indicators (i.e. type of sample), the collection of samples or observations, the characterization of sampled material, dealing with uncertainties, data analysis and reporting the results. The GESAMP report guidelines cover all size ranges of plastic litter encountered in the marine environment, on shorelines, floating on the sea surface, suspended in the water column, deposited on the seabed or associated with biota (ingested/encrusted/entangled). The GESAMP report guidelines may be used for the monitoring of items originating from specific sources (e.g. Abandoned Lost or otherwise Discarded Fishing Gear, ALDFG) or specific items to evaluate the efficiency of dedicated reduction measure (e.g. single-use consumer plastics, sanitary related items).

Part I Review of monitoring, survey designs and methodologies

Part I of this report introduces different types of marine litter surveys and monitoring methodologies. This section highlights key facets to consider when designing marine litter surveys or monitoring programmes to guide future monitoring and survey efforts.

3. WHAT IS MARINE LITTER MONITORING?

"Marine litter monitoring", as adapted from The United Nations Environment Programmes' Evaluation Manual (2008) definition of monitoring, is the regular collection and analysis and distribution of information for the surveillance of plastic and other anthropogenic litter in marine, coastal and aquatic environments.

These data, when analysed, can aid in identifying marine litter baselines, changes, the progress or limitations of interventions or management activities as early as possible. Such data can support governing bodies, project managers and communities to implement or adjust management actions or activities as needed. Monitoring is a continuing process throughout time and/or space or throughout the implementation of a project or management plan. Often, monitoring programmes are initiated, and paused, though the benefit of the effort may extend beyond completion. Single or "one-off" data collection efforts, or 'surveys' do not constitute marine litter monitoring. However, a collection of one-off survey efforts, if appropriately harmonized, can feed into one national programme or source inventory.

Furthermore, every monitoring programme begins with an initial or 'one-off' effort. It is when such initial efforts (which may start with a baseline survey effort) are continued, that a monitoring programme has begun.

4. WHY MONITOR OR SURVEY MARINE LITTER?

Why monitor or survey marine litter? Having an answer and specific outcome in mind and an answer to this question is the premier consideration for designing a programme. Having clarity on the goal or purpose is primary and sits at the top of the hierarchy when designing a marine litter monitoring programme. Once there is clarity of purpose, selecting the best approach which will answer the questions and address the goal or purpose becomes more straightforward.

Common reasons for embarking on marine litter monitoring programmes include:

- Looking at the changes in quantity and/or composition of marine litter through time;
- Facilitate decision making with respect to marine litter;
- Understanding whether there are problem litter items in your local region;
- Understanding the sources and sinks of marine litter in your region;
- Understanding movement of litter within a or between regions;
- Understanding how marine litter in your local area compares to other areas.

The information gained from monitoring programs is increasingly gathered for the purpose of informing policy decisions to reduce inputs to the coastal and marine environment. The reduction of marine litter is a goal sought to improve quality of life for humans and wildlife, for example:

- Maintaining a beautiful environment. Marine litter can be an eyesore and reduces the economic and perceived intrinsic value of an area;
- Protecting the environment;
- Safeguarding human health;
- Conservation of wildlife.

However, all marine litter surveys are not equal in the quality of data that they can provide to fulfil the above goals. Survey design is a key component in developing a quality data set. It is useful to consider design at multiple levels, whether embarking on a new, or modifying an existing programme. Marine litter monitoring programmes can be ongoing programs, or may commence with one-off surveys, often with a specific goal in mind. These two approaches are designed in very similar ways, but there are some key differences between them. It is important to understand that one-off surveys often form the basis for ongoing monitoring programmes, and that both survey types are valuable and informative to programme managers and policy makers.

Suitability of Plastic Pollution Assessment Methodologies (SPAM) toolkit

Need help identifying or narrowing down 'what is my objective' and 'which methods are best suited towards meeting my objective'? The "Suitability of Plastic Pollution Assessment Methodologies (SPAM)" toolkit, developed by the World Bank in collaboration with external contributors may be a useful place to look, as will be the GESAMP guidelines.

a. Marine litter monitoring programmes

Marine litter monitoring programmes are ideally conducted on an on-going basis. Marine litter monitoring programmes are the most useful approach to assess changes through time and responses to policy change, given that they will optimally provide long-term information about debris in the programme area. Marine litter monitoring programmes are often funded by government, non-government organizations or a private entity that has access to ongoing funding. Sometimes there is a specific policy-related goal associated with a monitoring programme, others are designed to prioritize environmental health through the removal of litter, while others may focus on fostering to community spirit. Ongoing litter monitoring programmes may be conducted daily, weekly, monthly, six-monthly, annually, or even bi-annually.

b. One-off marine litter survey programmes

Some marine litter surveys occur just one once, or several times across a fixed duration, and are usually designed with an end goal in mind. For example, a survey designed around a research question, such as the amount of litter in a particular waterway, or to test the effectiveness of a policy change, such as a grocery bag ban. While one-off surveys do not constitute a monitoring programme, a collection of one-off survey efforts, if appropriately harmonized, can feed into one national programme or source inventory, and are included as valuable resources in this report.

Many university studies and research programs are one-off marine litter survey programs, though these programmes might involve multiple surveys throughout a fixed period. Funding to undertake the litter surveys may be linked to a particular outcome. Though one-off marine litter surveys are often not the best tool to examine long-term time trends, they are ideal for situations where there are resources available to achieve a specific goal. The data from one-off surveys can provide useful snapshots of litter in a habitat or region though, and longer-term litter monitoring programmes may be instigated by the results of one-off surveys.

If the goal of a one-off marine litter survey programmes is to monitor the success of a policy, we recommend that the survey incorporate a Before–After-Control–Impact (BACI) design (Conner et al., 2015). BACI designed studies are ideal to look at changes in litter or marine debris before and after a policy has been implemented or another local change has taken place (such as more bins, drink refill stations or plastic bag bans).

Situations where a BACI designed survey might be utilized:

- To monitor the effectiveness of policy change (such as introduction of a new waste facility or prohibition on a type of single use plastic)
- To monitor the outcome of a land-use change (such as a new housing development);
- To monitor the change, if any, of litter in areas where a new park or additional waste bins have been located.

Before–After-Control–Impact (BACI) design of surveys seek to assess local changes in marine litter:

1. Identify two types of site: those that will be subjected to the disturbance, the "impact" site; and those that will not, the "control" site;

2. Choose multiple sites within each of the “impact” and “control” regions (replication) to conduct surveys, surveying the variables of interest at all sites (for example, the number of plastic bags and other litter before a plastic bag ban);
3. Conduct the same type and number of surveys within the each of the “impact” and “control” regions both before the intervention/impact takes place and after the intervention/impact takes place

Improvements to BACI designs:
Sometimes single “control” or “impact” sites can be subject to unexpected changes (for example, if a flood affects the site). To overcome this potential issue, monitor multiple sites of each type if possible, and conduct multiple surveys before and after the disturbance. This is sometimes called a ‘multiple before-after-control-impact’ (M-BACI) design.

One-off litter surveys often form the basis for ongoing monitoring programmes and can provide valuable snapshots of litter in time and space. This information can feed into and form the basis of a data-driven foundation for policy or decision making.

5. HABITATS

There are four major habitat types that are surveyed. These include shorelines/coastal environments, rivers and waterways, oceans (sea surface, water column and seafloor) and biota. Inland habitats, including natural, built environment and refuse collection facilities are also surveyed for litter and solid waste. As this report focuses on marine litter monitoring, we focus on the marine and aquatic rather than the inland habitats. There are four main habitats for monitoring marine litter quantity and change through time identified by GESAMP (Kershaw et al., 2019): shoreline, seawater, seafloor and biota. We expand on these categories to include aquatic waterway environments.

a. Shorelines and coastal environments

Coastal environments encapsulate the transition from terrestrial landscapes to the ocean. Items found in coastal environments tend to include a mix of locally deposited (lost or littered) items that have been dropped directly into the coast or have been transported from a nearby land-based source via wind or rain, litter that has arrived from nearby via local river inputs, and items that may have been transported by oceanic processes such as currents and onshore wind. Coastal environments are the most popular regions to conduct marine litter surveys because coastal environments are often valued for their recreational value and it is the clear interface between land and sea. Many coastal environments include beaches of various substrates, and small islands may be considered entirely coastal with respect to marine litter. Surveys and monitoring programmes of shoreline and coastal environments may focus on the litter sitting on the substrate surface, in the intertidal zone, buried in the substrate/sediment (for example, buried in sand), or a combination of these compartments. Manual clean-ups, often including citizen scientists or volunteers, are the most popular way that coastal monitoring programs or surveys are conducted. However, a range of other techniques also exist, such as beach-sweeping of sandy beaches and remote sensing surveys, such as those that use video footage taken by unmanned aerial vehicles or drones.

Available guidance: GESAMP Chapter 4. Monitoring methods for shorelines.

b. Rivers and waterways

Though not strictly a marine environment, rivers are an increasingly common habitat for anthropogenic litter survey programs, as they reflect items that are locally deposited from the nearby human population and rarely confounded by items that arrive via oceanic transport. Monitoring of anthropogenic litter in freshwater or brackish aquatic environments has many parallels with

monitoring anthropogenic litter in the marine environment, and the same monitoring principals largely apply. The quantity of litter that flows down a river is typically strongly linked to rainfall, with more litter being transported with large rainfall events, and less litter being flushed or transported when the weather is dry. River monitoring programs, like coastal and other monitoring programs, will optimally include the weather at the time of the survey, whether significant rainfall has occurred before the survey, and the time since the last major rainfall event. Manual clean-ups of the edges of rivers and waterways often include citizen scientists or volunteers. Other methods include the use of booms to capture litter as it is transported down the river and remote sensing, such as video recording devices placed on the underside of bridges and other infrastructure.
UNEP has recently developed guidelines for the assessment of plastic contamination, from macro- to microplastics, in freshwater environments. The report contains the most current procedures for monitoring and analysing plastic content in rivers, lakes, reservoirs and water/wastewater treatment plants (UNEP 2020). The report builds on the large body of knowledge and experience gained from marine plastic monitoring and was developed through a project group, consisting of seven experts in different fields, co-led and funded by UNEP. The report aims to provide guidance for monitoring and assessment methods of plastic waste in freshwater, toward harmonization of monitoring protocols that enables results to be easily compared and integrated in a growing database of knowledge and understanding of plastic pollution sources, pathways and impacts.

Available guidance: United Nations Environment Programme (2020). Monitoring Plastics in Rivers and Lakes: Guidelines for the Harmonization of Methodologies. Nairobi.

c. Oceans (sea surface, water column and seafloor)

Oceanic surveys may encompass the sea surface, water column and/or the seafloor. Ocean plastic usually arrives from inhabited landmasses, where litter is transported to the ocean via rivers or from the coast, ultimately ending up along the coastline or in the ocean. Marine litter can also arrive in the ocean through direct deposition of litter from boats, including both intentional deposition such as dumping at sea of land-based waste and waste from ships, or accidentally through items falling off ships or fishing gear becoming lost/derelict (Derraik 2002). Marine litter in the ocean is typically much more sparsely dispersed compared to coastal and river environments but can accumulate in high densities in some regions near to the coast (Hardesty et al. unpublished), on the seafloor in submarine canyons (Peng et al. 2020; Woodall et al. 2014), as well as in subtropical oceanic gyres or along windrows. The North Pacific subtropical gyre is famously referred to as the “Great Pacific Garbage Patch” for its high density of buoyant marine litter, with an estimated 1.8 trillion items, weighing an estimated 79 thousand tonnes, floating in an area of 1.6 million km^2 (Lebreton et al., 2018). Surface trawling, such as using a manta net, is the most common method for sampling the sea surface for floating debris. Seafloor surveys often occur by manual counts, with the use of bottom trawl nets and via clean-ups of litter on the seafloor carried out by divers. Additional survey approaches include the use of dredges and core sampling of debris embedded in the sediment, and photographic and/or video footage taken by manned or unmanned underwater vehicles or robots. Sampling of the oceanic water column is the least common survey method, with very little known about marine litter throughout the water column.

Available guidance: GESAMP Chapter 5. Monitoring methods for the sea surface and water column and Chapter 6. Monitoring methods for seafloor.

d. Biota

Many marine and coastal species eat and become entangled in marine litter. Surveying biota can be a useful way to sample litter for environmental monitoring purposes, for wildlife conservation and animal welfare purposes. It is also an approach that is increasingly taken to understand the potential impacts to human health. Edible biota such as the blue mussel, *Mytilus edulis*, and small fish such

as anchovies, *Engraulis sp.*, and sardines, *Sardina sp.* and *Sardinops sp.* are common taxa for study (Pennino et al., 2020; Renzi et al., 2019). Commercially harvested species of edible bivalves and small fish are often selected as they are abundant in the environment, commonly eaten, and single animals have a low monetary value. Stomach samples from edible species are often sub-sampled from intentional harvests for human consumption for the purpose of quantifying the amount of plastic or micro plastic contained therein. When monitoring biota that are known to interact with plastic but are threatened, such as marine mammals, sea turtles and seabirds, individuals are typically opportunistically collected. Opportunistic collection methods include those that are caught as by-catch in fisheries, and those that naturally wash up dead on the beach. Plastic can also be monitored in the waste products of some wild animals, for example, by collecting the scats of sea lions or the regurgitated pellets of seabirds.

Available guidance: GESAMP Chapter 7. Monitoring methods for marine biota.
United Nations Environment Programme (2020). Monitoring Plastics in Rivers and Lakes: Guidelines for the Harmonization of Methodologies. Chapter 5.6 Sampling of freshwater biota.

6. SURVEY DESIGN

Survey design is the key underpinning component required to develop a high-quality data set. It is useful to consider design at a number of levels, working down through a hierarchy (Hardesty et al., 2016). For quality data to be generated from a monitoring program, whether that be coastal environments, rivers and waterways, oceans or biota, balance and representation is critical. Surveys are ideally balanced across variables that are being assessed, control for biases are incorporated into the study design and included within site replication. An ideal monitoring programme also affords the opportunity to make predictions about areas where surveys are not able to be conducted. Therefore, the sampling design must cover the range of conditions for which predictions will be made.

a. Balanced surveys to account for potential variables

Surveys should be balanced across any variable for which inference or conclusion is to be made. For example, for monitoring change in debris load or composition through time, surveys need to cover the time period in question. Similarly, for detecting change and variation across geographies, it is best if all locations are surveyed or monitored at similar intervals i.e., consistently. For example, if the goal is to detect temporal or geographic change across rivers, then sampling should be structured according to the river locations and representatively account for factors that could confound or bias the results, such as the number of people living near to the river. If the sampling is not balanced, for example, including variations in sampling over time or location, this can make it more difficult to interpret the findings.

b. Avoiding bias in site selection

For sound survey design, it is critically important to control bias in site sampling. Controlling for bias is particularly important in situations where there may be correlations between the chance of choosing a site and the variables affecting the site. For instance, access to coastal sites might be part of the survey location choice but is also likely to affect visitation rates by the public, which could also influence deposition rates for debris. It is important to use tools like randomization to avoid these biases to the extent possible, and where not possible to collect data to allow estimation of their effects in the analysis.

c. Within-site replication

Due to variation at sites, it is important to have within-site replication. Coastal and inland locations, in particular, vary significant in their litter loads even at small spatial scales (for example, there may be an accumulating cove at one end of the beach site, where one may record orders of magnitude more debris or litter). Replication at the site level and stratification of replicates across the conditions

at each site can assist in allowing estimation or identification of the variables that contribute to the differences that appear in litter loads, for example. Finally, controlling survey effort and observation error is a key consideration. Ideally, any item in a survey should have an equal probability of detection, irrespective of size, shape, location, and observer. This is clearly an impossible task, thus it is important to control observer effort and detection probability to the extent possible. This can be done through standardizing search area, search approach (i.e., do observers record what they observe from standing height, bend down, sift through sand, etc.) search time, and search speed.

d. Sampling hierarchy if predicting outside observed conditions

Finally, given the impossibility of conducting surveys under all circumstances or at all locations, ideally why we want to be able to make predictions about sites we not have not been able to survey. Hence, it is essential that the sampling hierarchy described above covers the range of conditions for which predictions will be made. Analysis of different data types requires a multitude of statistical tools. Clearly identifying the main questions or goals of the project at the outset allows for appropriate analysis and interpretation of data. For example, if one wants to identify the baseline level of litter on the coastline and the goal is to make projections outside of where litter was collected or reported at sites, it is important to stratify the sampling such that various coastal types are sampled in proportion to their occurrence. If surveys only encompass one substrate type or are of one shape, aspect, or slope, it is difficult to make predictions about the amounts of litter that may occur at other sites within the region.

7. USE OF CITIZEN SCIENCE MARINE LITTER SURVEYS

Citizen science surveys are often utilized with the intention of collecting data at minimal cost across broad geographic and temporal ranges (Dickinson et al., 2010). For marine litter, citizen science surveys have been found to be similarly robust to more formal scientific surveys and equally accurate at identifying litter types (van der Velde et al., 2017), though there has been a reported detection bias against small items (Loizidou et al., 2018). One caveat concerning the representativeness of citizen science clean-ups compared to designed surveys is that citizens typically target easily accessible, ‘dirty’ and accessible areas - that is, sites which are “accumulating” sites for marine litter (Hardesty et al., 2017). Targeting sites in this manner makes it difficult to extrapolate to other regions, in contrast to taking a designed-based approach (Hardesty et al., 2017). Despite these caveats, citizen science surveys provide valuable and accessible broad-scale data.

a. Incorporating citizen science into marine litter monitoring

Citizen scientists often provide a valuable contribution to marine litter monitoring programs. When working with citizen scientists, it is important to ensure that those contributing their time and passion to the project are sufficiently trained in survey protocols and methodology if joining an existing programme. If initiating a new program, we recommend that the citizen scientists are encouraged to follow the guidelines provided in this report, and to prioritize surveys of regions that are under-represented within existing marine litter monitoring programmes. We also recommend experienced and professional surveyors provide training and support to citizen scientists. This support might come in the form of assistance designing a survey program, provision of training videos, or even remote mentorship. This is even more important if citizen scientists are acting in coordinator or leadership positions. We recommend that citizen scientists are properly trained in the methodology before the clean-up or monitoring activity begins. For volunteer participants, this training could occur immediately prior to the beginning of the program, especially if the group consists of one-off or ‘drop-in’ volunteers. For citizen scientists that will be acting in leadership/coordinator roles, or volunteers that are contributing on an ongoing basis, we recommend dedicated training sessions be conducted before the start of the activity. We further recommend that trained or professional surveyors be on-site during the initial surveys to support citizen scientists, answer questions and ensure that the methodology is being correctly followed. Ideally, even the simplest “clean-up” activity will report 1) the number of people engaging in the activity; 2) the amount of time spent by participants in the activity; and 3) the area that was surveyed or cleaned up.

Citizen science example: A local government was under pressure to conduct marine litter surveys through local wetland areas, but was suffering staffing and resource shortages, creating frustration for residents. A local "friends of the wetland" community group banded together to help the local government keep their wetlands clean, agreeing to meet once monthly for a two-hour clean-up and survey. The local government surveys were carefully designed with clear methodologies. The survey protocols were emailed to participants; however, no training was provided. Once received, the community groups diligently got to work removing litter from their local wetlands. One group cleaned the wetland but did not carefully itemize and record the collected litter, seeing careful record-keeping a waste of time that could be used to remove more litter. Another group contained a particularly enthusiastic subset of participants, who would continue to pick up litter for many hours after the two-hour survey's conclusion, diligently recording each item along-side those that were counted during the two-hour survey. Without training on survey procedures and importance of record-keeping, these well-intended deviations meant that it was no longer possible to harmonize survey data to meet broader litter-reduction and policy goals. Simply put, the two groups did not record information or carry out activities in the same way. If they had recorded the number of people at each session, the amount of time spent during the activity, and recorded the size of the area that was cleaned up, comparisons could have been made, in spite of the differences.

Available guidance: GESAMP Chapter 3.5. The role of citizen science. CSIRO methods handbook.

8. EXAMPLES OF GLOBAL MARINE LITTER MONITORING PROGRAMMES

There are hundreds if not thousands of litter monitoring programmes globally, including programmes run by governments, NGOs, universities and community groups, occurring across multiple habitat types. Among these programs are four large, multijurisdictional programmes, the larger of which have been adopted across more than 100 countries globally. These surveys are undertaken by a combination of citizen science surveys and professional surveys.

a. Ocean Conservancy International Coast clean-up (ICC)

The Ocean Conservancy is a United States of America based Non-Government Organization (NGO) that advocates for environmental issues affecting the ocean. The Ocean Conservancy began the 'International Coastal clean-up' programme more than 30 years ago. This volunteer-led coastal marine litter survey and clean-up programme has been run in more than 150 countries. Ocean Conservancy's ICC programme includes coastlines, rivers and waterway habitats.

b. Project AWARE Dive Against Debris

Project AWARE Dive Against Debris programme is a seafloor citizen-science marine litter survey and removal programme, launched in 2011. Since the programme's inception, Dive against Debris has been undertaken in 120 countries around the world, reporting over 1.6 million pieces of litter.

c. National Oceanic and Atmospheric Administration Standing Stock Surveys

The National Oceanic and Atmospheric Administration's (NOAA) monthly Marine Debris Monitoring and Assessment Project (MDMAP) is part of the United States of America's NOAA Marine Debris Program. The NOAA standing stock survey programme focuses on shorelines habitat and is applied broadly across numerous jurisdictions in the United States of America. The NOAA MDMAP serves as a template for multiple litter monitoring programmes.

d. CSIRO Global Leakage Baseline Project (GLBP)

The CSIRO Global Plastic Leakage Baseline Project (GLBP) applies designed field surveys and mathematical modelling to document and predict the distribution of plastic lost to the ocean from major urban centres and surrounding areas around the world. In its inception, the statistically robust, designed project focused on countries that have been identified as having significant waste

mismanagement or losses into the coastal and marine environment. CSIRO's GLBP survey programme comprehensively captures data from multiple habitats, including coastlines, rivers and waterways, sea surface and inland sites. It is suitable for trained volunteers and is providing the most robust global estimate of plastic losses to the marine environment in the world, based on empirical data.

e. Survey design in global marine litter monitoring programmes

The four listed global marine litter monitoring programmes, Ocean Conservancy ICC, Project AWARE Dive against Debris, NOAA standing stock surveys and CSIRO Global Plastic Leakage Baseline Project each take different approaches to survey design. Here we summarize survey design and sampling bias identified in each of these programmes.

Table 1 Survey design in multijurisdictional global marine litter monitoring programmes

SURVEY DESIGN	OCEAN CONSERVANCY INTERNATIONAL COAST CLEAN-UP (ICC)	PROJECT AWARE DIVE AGAINST DEBRIS	NOAA STANDING STOCK SURVEYS	CSIRO GLOBAL PLASTIC LEAKAGE BASELINE PROJECT
Stratification of sites	NO	NO	NO	YES
Randomization of site location	NO	NO	NO	YES
Replication within sites	NO	NO	YES	YES
Stratification within sites	NO	NO	NO	YES
Randomization within sites	NO	NO	YES	YES
Control of survey effort	NO	NO	YES	YES
Control of detection probability	NO	NO	YES	YES

Table 1. Shows that multijurisdictional litter clean-up and survey programmes are not equivalently suitable for COBSEA RAP MALI Objective 4: Improve monitoring and assessment of marine litter and its impacts for a science-based approach.

9. SCIENCE-BASED BEST PRACTICE APPROACHES TO MARINE LITTER MONITORING

From the globally accepted guidelines of the GESAMP 2019 report, and the review of literature, we have compiled five science-based, best practice suggestions for marine litter monitoring.

The five tenets for designing national and regional scale marine litter monitoring programmes (e.g., establishing baselines and monitoring changes through time):

1. Clearly delineated and repeatable methods.
2. Quantification and reporting findings in a way that is harmonized with other surveys and uses policy-relevant categories, as best possible.
3. Representative capture of variation within each habitat to avoid sampling bias.
4. Accounting for data collection effort.

5. Representation of different habitats.

a. Summary of survey design suggestions

Clearly delineated and repeatable methods

Repeatability and reproducibility are a challenge for all scientific disciplines and monitoring programmes. This is also challenge for marine litter monitoring, where questions such as "when" "where" and "how" can completely change how a survey is conducted and the results found, based upon the data collected. When, where and how are especially important in long-term monitoring programmes to be sure that the results found are representative and are not artefacts of a survey conducted in a different place (even small distances can affect the litter found in complex and heterogenous habitats), at a different time (monsoon vs dry season, before or after a big celebration or clean-up) or using a different search method (vehicle survey vs foot, walking vs hands-and knees, recording what is on the surface vs digging through sand). Controlling for detection probability by specifying the searching methodology is particularly important. For example, the methodology may specify searching by walking in a straight line or transect (rather than random searching) or searching while standing (rather than on hands-and-knees).

Methodology example: A local river-watch group conducts monthly clean-ups along the banks of a river, removing items from the riverbank and meticulously recording data on the types of items removed and where they are located. To make sure surveys were comparable, the same section of river was always surveyed. The clean-up is run with a rotating roster of clean-up co-coordinators, who direct staff and volunteers. After several years of clean-up, the data was analysed, and it was realized that though plastic items were consistent between months, some clean-ups had many more glass and ceramics recorded than others, and some coordinators found no glass or ceramics at all on their clean-ups. When clean-up coordinators were asked about their methods, some were instructing their participants to get on their hands and knees while searching, and to remove underwater litter that they can reach. Other clean-up coordinators did not get on their knees to search and did not pick up submerged items. To remedy the problem, all clean-up coordinators held a training to ensure that the methods were consistent, clearly delineated and repeatable in the future.

Quantification and reporting findings in a way that is harmonized with other surveys and uses policy-relevant categories

There are many different methods by which marine litter monitoring programmes quantify and report their findings. The usefulness of a study is ultimately determined by the quality of this reporting, which is based upon the data collected. The ability to 'harmonize' and to directly compare findings and glean policy-relevant information from these studies/programmes is key for designing effective and successful monitoring programmes.

Harmonization example: A popular coastal resort town runs marine litter clean-up activities each year. Several of the beach-side resorts participate in the Ocean Conservancies ICC programme and the local dive centre runs coral reef clean-ups through Project AWARE's Dive against Debris programme. The resorts continued to operate through the COVID-19 pandemic with mandated use of latex gloves and masks for staff and guests. After a Project AWARE's survey, the dive centre approached the resort management to complain that the coral reef was covered in latex gloves and that they need to do something to stop their staff and guests irresponsibly disposing of gloves. The resorts suggested that gloves are not from the resort, but waste from a nearby food preparation factory flowing downstream into the reef. They further argued that no latex gloves were found on their recent ICC programme on resort beaches. However, when the data was checked to work out whether the factories or resorts were to blame for the influx of gloves, it was

not possible to verify whether the number of gloves on beaches had changed since the pandemic due to a mismatch in reporting categories.

Policy-relevant categories example: A regional fisheries organization is concerned about the plastic they pull up in their fishing nets and wants to understand whether the fish they are catching and selling for human consumption are eating plastic. Looking on the internet, they found a study that examines the shapes and material of marine litter items that different fishes eat and whether these items resemble the natural prey of the fish. Interested to understand whether the fish they catch and sell eat similar items. Knowing the importance of method harmonization, they follow the clearly delineated and repeatable methodology provided by the authors, following step-by-step to conduct an identical study. By sampling the diet contents in the stomachs of 1 in every 100 fish caught for a month, they found that most fish were eating 'linear' shaped litter items, but not ball or sheet shaped items, and that all litter items eaten by the fish were plastic.

A report was written and presented to policy makers to reduce the input of litter items that fish are likely to eat. When the policy makers read the report, they were very concerned about the public health ramifications, but did not know the source of 'linear' plastic as they did not know what the items were. Experiencing pressure to act, the policy makers approached a fishing tackle supplier about fishing line and a logistics company about rope and strapping. The tackle supplier said the linear plastic must be ropes from the logistics company as fishing line is too long for fish to eat. The logistics lobbyist said that the linear plastic must be fishing line from recreational fishers as they don't lose their ropes or strapping to the ocean. Had the fisheries organization reported the relevant level of detailed information, they could have reported that most of these 'linear' items were fibres from polyester clothing and fragmented nylon rope. This policy-relevant information could aid legislation about treatment of wastewater to reduce polyester fibres and incentivize the replacement of old frayed nylon ropes for local marine industries.

Representative capture of variation within each habitat to avoid/minimize sampling bias

Biases can be easily introduced by not representatively capturing within-habitat variation. Often sampling biases are not intentional, but small differences in the way a survey is conducted can lead to very large differences in results. Biases can be introduced by lack of randomized or representative site-selection, for example, concentrating marine monitoring on the dirtiest beach along a coastline, or even just surveying the litter-dense strandline of a beach, at the high tide mark. Therefore, the surveys are best designed in such a way that the monitoring programme representatively records data from within each habitat or sub habitat type. Randomization of survey sites and within-site replication, within each habitat is the best practice. Randomization and within-site replication are not always possible, and there are other suitable (analytical) methods available to achieve statistical robustness in analyzing data from monitoring programs.

Representation within habitat example: After complaints from residents about dirty beaches, a local council set up a marine litter monitoring programme to find the source of the issue. The municipality is bordered by a zig-zag coastline containing 10km of sandy beaches. Across one month, council officers conducted weekly surveys of the 2km stretch of sandy beach that was closest to their workplace. They chose to monitor this beach because it is easiest to get to, sheltered by the strong onshore winds affecting other beaches and has popular food stands to buy lunch after the survey. The survey concludes and the municipality found that the main debris items affecting their municipal area is the packaging of food and beverages sold by food stands along the beach and littered by beach goers. The municipality begins to implement a plan to provide additional bins and encouraged the food stands to reduce packaging of take-away food. After successful implementation, they were confused when residents continued to complain about the dirty beaches. By surveying just one beach, the council did not have the data to understand the broader litter patterns in their municipality. Beach aspect, accessibility and infrastructure affect the accumulation of different quantities or types of litter. In this council area, the adjacent beach,

facing a different direction and into onshore winds, is littered by plastic and hygiene waste transported by a major river nearby.

Account for survey / data collection effort

Variation in survey effort can mislead results and undermine an entire programme if survey effort is not controlled or accounted for.
Measures of data collection effort may include:

- The number of people that carried out the survey,
- The size of the survey area, and
- How long people spend searching (Hardesty et al., 2016).

Sampling effort need not be absolutely consistent on every survey, but it does need to be accounted for in survey design and execution, so that changes detected can be confidently distinguished as real, and not an artefact of sampling bias. By quantifying sources of survey effort, such as the number of people, area surveyed and survey duration, statistical methods can be applied to the results to reduce or account for sampling biases. Standardization methods takes this information into account to get a 'true' representation of the amount of litter at each site. This is not to say that people must spend the same amount of time conducting each survey. By simply recording the start and stop time of each survey, for example, and how big an area and how many people are searching the area, analysis can take the differences into account.

Survey effort example: After the introduction of container deposit legislation, a follow-up citizen science survey of plastic bottles in a wetland finds more plastic bottles than during the initial wetland survey. However, a survey organizer reports that more people undertook the follow-up survey than the initial survey, but the number of participants was not recorded. Did the legislation cause more plastic bottles to be deposited in the wetland, or was the outcome biased by more participants finding more bottles? Did they look harder so they could retrieve bottles and receive the financial reward? Without recording key pieces of information, it is not possible to answer these questions.

Representation of different habitats

Different types of habitats accumulate different types and quantities of litter (Roman et al., 2020). To account for the inventory of litter in the marine environment, different habitats must be sampled according to the objectives of the monitoring programme. There are four main habitats for monitoring marine litter quantity and change through time (Kershaw et al., 2019): shoreline, seawater, seafloor and biota. Different survey approaches are required for each of the different ocean compartments.

Representation of different habitats example: A local marine animal rescue and rehabilitation NGO was concerned about the amount of sea turtles that were arriving in their facility with plastic in their stomach. However, beach monitoring programs showed that sandy beaches in the area had very little plastic on them, and therefore the government concluded that the sea turtles must be eating plastic outside of the jurisdiction. Not convinced, the NGO commissioned a marine litter survey of a major river coming out from the city, and sea surface trawls in the river's delta, revealing large loads of plastic in both. As not all beaches accumulate plastic, depending on variables such as wind direction, the direction of currents, onshore forcing and the shape of the beach, the local authorities were underestimating the amount of plastic entering the marine environment and impacting on endangered marine species.

Part II Inventory of monitoring efforts in COBSEA countries

Part II of this report describes the marine litter monitoring and survey programmes undertaken by COBSEA participating countries.

10. WHAT IS CURRENTLY BEING DONE IN COBSEA COUNTRIES?

To identify existing monitoring programmes and knowledge gaps, COBSEA participating countries provided information on monitoring efforts within their respective countries. As suggested by the WGML, first, these efforts were **compiled** in a monitoring inventory (see below) that has been updated and completed pending remaining country inputs and further validation. This forms the foundation of this document which serves as a regional guidance report. Second, existing programmes and efforts were **reviewed** in view of the five survey design suggestions in line with international guidance (see Part I). Finally, these tables serve to identify **successes, gaps and opportunities**; what is done well (successes), where gaps remain for further development, and the opportunities to improve and harmonize approaches. Findings were shared with countries and the WGML to provide additional input and validate compiled information to inform further discussion of joint objectives, core indicators, harmonized approaches and quality standards.

a. Timelines

After the initial webinar on the 7th of October 2020, an Excel spreadsheet was sent to participants during November 2020. The spreadsheet asked the participants nine questions, including a request to list the programmes, actions, activities currently taking place, the details or what is or was done, what are/were the goals of the activity, what are/were key questions addressed, what is/was the frequency of the activity and starting year, where the activity/activities took place (location), and whether there is a datasheet and communication materials.

From the survey results, we compiled the following marine litter monitoring regional guidance. The inventory was initially not exhaustive, as not all countries provided information. Through additional efforts, deeper engagement with countries and additional time has allowed countries to share their information and provide input on the initial monitoring inventory, enabling us to build this regional guidance document. Data shared by countries will not be made publicly available without country consent. The information collected will be used to meet the recommendations in RAP MALI and from WGML for identifying marine litter monitoring efforts in COBSEA countries toward regional harmonization.

Note: the information from some of the country partners was received several months after the proposed date and was integrated into the document at a later stage.

Table 2. Timeline of items and contact dates that have occurred to date.

17 OCT 2020	Webinar held on process towards preparing regional guidance on harmonization							
BY DEC 2020	Participating countries invited to provide information on existing marine litter monitoring programmes							
Marine litter programme information received, validated and integrated in the regional monitoring inventory:								
CAMBODIA	CHINA	INDONESIA	MALAYSIA	PHILIPPINES	REPUBLIC OF KOREA	SINGAPORE	THAILAND	VIET NAM
16/12/20	15/04/21	COBSEA focal point 07/04/21 & CSIRO contacts 19/02/21	17/11/20	21/02/21	22/01/21	17/12/20	17/12/20	COBSEA focal point 06/04/21 & CSIRO contacts 02/03/21
18 MAR 2021	Webinar presented draft inventory and initial recommendations for country input							
29-30 JUN 2021	3rd Meeting of the WGML reviewed and finalized Guidance and recommended for adoption							

b. Compiling an inventory of marine litter monitoring efforts to inform regional guidance

Ongoing monitoring programmes and efforts by COBSEA participating country were catalogued, based on information provided to CSIRO by COBSEA WGML focal points and additional monitoring contact persons and technical partners via an Excel spreadsheet. In addition to the information provided by COBSEA focal points, we also used information from Project AWARE's DAD reports, Ocean Conservancy's ICC reports, CSIRO contacts and partners, CSIRO's GLBP website and ASEAN+3 meta-data searches of published literature on marine plastics to include additional information.

Across COBSEA member countries, 135 programmes were identified. These included a combination of one-off surveys/programs and ongoing active marine litter monitoring programmes. Some monitoring programs occur secondary to well-known international clean-up programs, including the Ocean Conservancy International Coastal clean-up and Project AWARE Dive Against Debris, which operate in most of the COBSEA participating countries. Some countries have specific marine litter monitoring programs, either based on an international litter monitoring methodology, such as CSIRO's Global Plastic Leakage Baseline Project, or a customized monitoring effort at either a national, subnational, or local/habitat scale. The most comprehensive marine litter monitoring programme occurs in the Republic of Korea, with bimonthly monitoring at 40 sites across the country.

c. One-off surveys and published outputs of previous one-off activities

A comprehensive suite of one-off surveys has been conducted in COBSEA participating countries. Information from participants identified more than 100 one-off programmes and surveys, most of which are research programmes undertaken by universities. A comprehensive information list is available in Appendix 1. A list of 269 publications on marine litter in ASEAN+3 countries, including meta-data of published literature on marine plastics, compiled by COBSEA and National University of Singapore in 2019 and 2020, is available in Appendix 2. The COBSEA plastic pollution research database has been expanded and updated in 2021 and will be available in 2022 through the East Asian Seas Regional Node. Some of the programmes identified by COBSEA participating countries overlap with those programmes and resulting publications compiled for ASEAN+3, while others do not overlap.

i. Cambodia

COBSEA focal points identified 15 activities that were one-off debris surveys or survey / community engagement activities (both one-off and ongoing), including household surveys and interviews about waste management. Most programs occur on Cambodia's islands including Koh Sdach, Koh Rong and Koh Krabey. Also included among one-off surveys is a river and waterway habitat in the Mekong River Delta. ASEAN+3 meta-data of published literature on marine plastics identified three publications on marine litter in Cambodia at the time this report was compiled, examining

macroplastics on the coastline of islands and on coral reefs. However, Cambodia focal points have identified that this ASEAN+3 meta-data of published literature on marine plastics is incomplete and that several additional reports/papers have been published.

ii. China

The People's Republic of China (PRC) COBSEA focal points identified five one-off marine litter programmes in PRC covering a variety of habitats. Examples include a baseline national survey of microplastics in coastal beaches, sea water, sediments and organisms and rivers flowing into the sea and monitoring programmes exploring several major rivers and estuaries.

Universities in China are dedicated in conducting and publishing marine litter research. ASEAN + 3 meta-data of published literature on marine plastics identified 129 publications on marine litter within PRC at the time this report was compiled. These studies comprised both environmental sampling studies as well as laboratory studies of plastic. Among the environmental sampling studies, several aimed to quantify macro and microplastics, and were conducted by universities. These survey and sampling efforts examined specific sites or groups of sites, with some studies containing as many as 20-50 sites. Through China, university marine litter studies cover different habitats including numerous sea surface trawl sampling studies, in addition to coastal and shoreline studies (mostly beaches), rivers and estuaries, sediment (ocean) and biota (oysters, mussels, clams, various species of fish and the Indo-Pacific humpback dolphin).

iii. Indonesia

Indonesia COBSEA focal points identified seven one-off programmes within Indonesia. The programmes primarily comprised of short-term marine litter monitoring, including a microplastics study conducted Indonesian Institute of Sciences (LIPI- Lembaga Ilmu Pengetahuan Indonesia), waste data collection by Marine Research Centre and university studies published as undergraduate theses.

PEMSEA has identified the ASEANO project that they are conducting baseline research into plastic pollution within the Citarum River Basin until 2021.

Furthermore, in collaboration with CSIRO, Udayana University in Bali conducted island wide surveys along the coastline, as well as in inland and riverine habitats.

ASEAN + 3 meta-data of published literature on marine plastics identified 64 publications on marine litter in Indonesia at the time this report was compiled. These activities predominantly comprised surveys and monitoring of a limited number of sites (most 15 or less) or whole islands, aiming to quantify macro and microplastics, and are conducted by universities. These survey and sampling efforts cover many habitats including coastal and shoreline studies (predominantly beaches), sediment (ocean and estuary), biota (bivalves, various species of fish) and sea surface trawl sampling.

iv. Malaysia

COBSEA focal points identified 69 surveys and activities in Malaysia. These activities predominantly comprised surveys and monitoring of a limited number of sites (most six or less) or whole islands, aiming to quantify macro and microplastics, and were conducted by universities. These survey and sampling efforts covered many habitats including coastal and shoreline studies (beaches, wetlands, mangroves), sediment (ocean and mangrove), biota (sea cucumber, various species of fish, zooplankton) and sea surface trawl sampling. Community group clean-up and surveys of coastlines and seafloors (coral reef) also occur in Malaysia. Surveys of rivers and waterways are less well represented than other habitat types. ASEAN + 3 meta-data of published literature on marine plastics identified 36 publications on marine litter in Malaysia at the time this report was compiled, which are included in the activities identified by COBSEA focal points.

v. Philippines

COBSEA focal points and ASEAN + 3 meta-data of published literature on marine plastics identified 15 publications on marine litter in the Philippines at the time this report was compiled. These studies included coastline debris (beach), seafloor sediment surveys, a river survey and surveys of biota, both edible (various fish species, oyster, cultured green mussel) and wild (cetaceans and sea turtle).

PEMSEA has identified the 'ASEANO project' that conducts research on both the presence and composition of plastic waste within the river, and the socioeconomic impact and use of plastic by nearby residents that may interact with the waste issue.

vi. Republic of Korea

ASEAN + 3 meta-data of published literature on marine plastics identified 67 publications on marine litter in the Republic of Korea at the time this report was compiled. These studies comprise both environmental sampling studies as well as laboratory studies of plastic, many conducted by various departments and institutes, in addition to universities. Korean studies typically cover large numbers of different sites (rarely less than 10, and up to hundreds) and predominantly cover coastlines and shorelines, and sea surface trawls. One biota study examines farmed bivalves. Numerous studies in ongoing research activities on plastics and micro plastics are led by OSEAN, an NGO that works closely with government and industry.

vii. Singapore

ASEAN + 3 meta-data of published literature on marine plastics identified nine publications on marine litter in Singapore at the time this report was compiled. Eight of these studies were conducted by the National University of Singapore and one by citizen scientists. These studies examined macroplastics and microplastics on different types of coastlines/shorelines, including intertidal coral reef, seagrass, mangroves and sandy beaches.

viii. Thailand

COBSEA focal points identified two one-off activities, one experimental study, and other of the barcodes of litter items on coastlines. ASEAN + 3 meta-data of published literature on marine plastics identified nine publications on marine litter in Thailand at the time this report was compiled. These included a combination of shoreline surveys (sandy beaches) and biota surveys (various fish species, oyster, barnacle, periwinkle, bivalves and a study of whale shark).

ix. Viet Nam

The response received from Viet Nam COBSEA contacts regarding ongoing marine litter programmes in Viet Nam identified seven programmes beginning in 2020, which have been listed here (Appendix 1) as one-off programmes. These include preliminary research on the state of marine plastic in some Marine Protection Areas in Vietnam that involve collection of relevant socio-economical information on the management of plastic debris in several cities and provenances.
The Institut de Recherche pour le Développement, France, provided information regarding three activities, a social survey and two surveys of waterways. The CSIRO Global Plastic Leakage Baseline Project has been conducted in Viet Nam, surveying coastlines, sea surface, rivers and inland in collaboration a Viet Nam NGO. ASEAN + 3 meta-data of published literature on marine plastics identified four publications on marine litter in Viet Nam at the time this report was compiled. Three were based on sampling activities, one of coastlines (beaches- plastic for persistent organic pollutant analysis) and two of rivers (Saigon River).

d. Ongoing monitoring programmes

Across the responding countries, 39 ongoing monitoring programmes were identified. Below is a table compiling the responses, and more comprehensive information is available in Appendix 1.

i. Cambodia

Cambodia partakes in two current and ongoing marine monitoring programmes, a reef monitoring programs, and Project AWARE. The reef health programs do not have marine litter as a focus, though the coral reef surveys collect incidental data on marine debris at two sites: Koh Rong Archipelago and Koh Sdach Archipelago. Multiple reef monitoring programmes occur, listed separately in Appendix 1, but these have been combined as reef health monitoring in Table 3. Of the seafloor programmes, only the Project AWARE dive against debris programme specifically targets marine litter, whilst the other programmes focus on monitoring reef health, and marine litter data collection is incidental. A third monitoring programme for the monitoring of micro-plastic in

freshwater ecosystems in the Mekong River Delta was due to start in 2019 but is currently on hold due to COVID-19.

ii. China

PRC COBSEA focal points identified three ongoing monitoring programs in the PRC, which cover a variety of habitats including rivers and waterways, shorelines and coastal environments and oceans (sea surface and seafloor). PRC conducts a comprehensive annual “China National Marine Litter and Microplastics Monitoring Project” that examines both macro marine litter and microplastics on beaches, the sea surface and seafloor across a broad range of sites along the mainland coastline. These activities take place as part of annual national water quality monitoring, summarized in the annual “Bulletin of Marine Ecology and Environmental Status of China”, at numerous sites across the coastline. PRC also undertakes a National Key Research and Development Program of China project on marine microplastic research: "Monitoring and Ecological Risk Assessment of Microplastic Marine Debris" and Coastal Marine Litter Survey and clean-up in Dalian, China.

iii. Indonesia

There were five ongoing monitoring programmes identified in Indonesia. Indonesian COBSEA focal points identified one national marine litter monitoring programme, monitoring beach litter throughout 26 locations conducted by the Directorate of Coastal and Marine Pollution and Degradation Control, Ministry of Environment and Forestry, Indonesia. This four-year beach monitoring takes place from 2017-2021, occurring 1-2 times per year. Project AWARE’s dive against debris programme, conducting seafloor surveys, is also regularly undertaken in Indonesia. Ocean Conservancy’s ICC programme of coastlines is carried out in Indonesia each year.

iv. Malaysia

COBSEA focal points and CSIRO identified five marine litter monitoring activities occurring in Malaysia. Tropical Research and Conservation Centre in Sabah conducts island coastline clean-ups throughout the year. A newly initiated programme seeks to take stock and report on marine plastic pollution in the Coral Triangle and to provide potential strategies to minimize it. Project AWARE’s dive against debris programme conducting seafloor surveys is undertaken in Malaysia. Ocean Conservancy’s ICC programme of coastlines is also undertaken annually in Malaysia.

v. Philippines

COBSEA focal points and CSIRO identified four marine litter monitoring activities occurring in the Philippines. ‘Adopt-an-estero Waterbody Program’ and ‘Manila Bay Clean-up Program’ focus on cleaning rivers and waterways, and coastal areas, however these programmes are clean-up focused primarily and survey data is not collected (sometimes mass of items, but items are not identified). Project AWARE’s dive against debris programme conducting seafloor surveys for Marine litter is undertaken in the Philippines. Ocean Conservancy’s ICC programme of coastlines is undertaken in the Philippines.

vi. Republic of Korea

COBSEA focal points and CSIRO identified three current marine litter monitoring activities occurring in the People’s Republic of Korea (ROK). The ‘Korea National Beach Litter Monitoring Program’ occurs bi-monthly across 40 coastline sites. Project AWARE’s dive against debris programme conducting seafloor surveys is undertaken regularly in ROK. The ROK is beginning, in 2020, a new microplastic monitoring programme “Microplastic distribution status monitoring”, which will cover 40-50 sites across the country and monitor microplastic on beaches, the ocean (sea surface and seafloor) and biota (oysters). Ocean Conservancy’s ICC programme of coastlines takes place annually in ROK.

vii. Singapore

COBSEA focal points and CSIRO identified five marine litter monitoring activities occurring in Singapore. Singapore conducts a nationalized version of the Ocean Conservancy ICC, “International Coastal Clean-up Singapore (ICCS)”, that cleans and records the data from 20,000 metres of

Singapore's shoreline. Project AWARE's dive against debris programme conducting seafloor surveys is undertaken in Singapore. In addition to these activities, there are two ongoing coastal clean-up programmes, one of beaches and one of mangroves, and a seafloor (coral reef) programme.

viii. Thailand

COBSEA focal points and CSIRO identified seven marine litter monitoring activities occurring in Thailand. Thailand's marine littering programmes comprehensively assess numerous habitat types, including waterways, ocean, coastline, and biota. Thailand has a quarterly programme collecting floating debris from major rivers and lake along the Coastal in the Gulf of Thailand using the stow net. Thailand also conducts an annual beach clean-up programme. Thailand conducts a biannual microplastic in sea water and sediment sampling programme. Thailand conducts occasional but ongoing gut content analysis of dead endangered marine animals, and amount of plastics are assessed. Furthermore, there is an annual estimation of the amount of plastic marine debris, calculated from amount of waste generated by 23 coastal provinces and proportion of plastics in the total waste. Project AWARE's dive against debris programme conducting seafloor surveys is undertaken in Thailand. Ocean Conservancy's ICC programme of coastlines is undertaken annually in Thailand.

ix. Viet Nam

The response received from Viet Nam COBSEA contacts regarding ongoing marine litter programmes in Viet Nam identified seven programmes beginning in 2020, though without specifying whether these programmes will be ongoing, and as such they have been listed as one-off programmes (see 10.3.9).

The Institut de Recherche pour le Développement, France, conducts the COMPOSE project "Creating an Observatory for Measuring Plastic Occurrences in Society and Environment", and assessment of microplastic in 22 aquatic environments (predominantly rivers and waterways). Project AWARE's dive against debris programme conducting seafloor surveys is undertaken in Viet Nam. Ocean Conservancy's ICC programme of coastlines also takes place annually in Viet Nam.

Table 3. Brief inventory of marine litter monitoring programmes in COBSEA countries. *Note: full inventory is provided as Appendix 1 of this report.*

Country	Habitat	Programmes, actions, activities currently taking place?	How often? (annually, monthly, weekly, daily)? For how long?	How big an area? Local, city, watershed, state/territory, entire country?
	Cambodia n= 3			
Cambodia	Oceans (Seafloor)	Reef Health Monitoring (incidental data collection re: marine debris) - Cambodian Coral Reef Monitoring Network (CCRMN)	Annually	National / coastwide - members include: Marine Conservation Cambodia (NGO);Wild Earth Allies (NGO); Centre for Biodiversity Conservation (CBC) & the Royal University of Phnom Penh (RUPP); Private sector diver shops, including Kuda Divers and the Khmer Dive Group; Liger Leadership Academy (student-led marine research team);

				Song Saa Foundation (NGO / Foundation); MaFREDI (Federal Marine Research institute); Royal University of Agriculture (RUA); Fisheries Administration (part of the Ministry of Agriculture, Forestry and Fisheries (MAFF)); FFI.
Cambodia	Oceans (Seafloor)	Project AWARE Dive Against Debris program	Commonly throughout year	Various locations, though most are concentrated at Koh Sdach, Koh Rong and Koh Kong
Cambodia	Rivers and waterways	Monitoring of micro-plastic in freshwater ecosystems in the Mekong River Delta	On hold	Mekong River Delta. Was due to begin 2019 and currently on hold due to COVID.
	Peoples Republic of China n=3			
China	Shorelines and coastal environments, Oceans (Sea surface and seafloor)	China National Marine Litter and Microplastics Monitoring Project	Marine litter since 2007, Microplastics since 2016	Coastal zone and coastal waters of China's coastal areas
China	Rivers and waterways, Shorelines and coastal environments, Oceans (Sea surface)	National Key Research and Development Program of China project on marine microplastic research: "Monitoring and Ecological Risk Assessment of Microplastic Marine Debris"	2016	Typical estuary (Yangtze River estuary, Pearl River estuary), offshore (Bohai Sea, Yellow Sea, East China Sea)
China		Coastal Marine Litter Survey and clean-up in Dalian, China	2003	There are about 30 sites in the coastal area of Dalian city.
	Indonesia n= 5			
Indonesia	Shorelines and coastal environments,	CSIRO / NOAA methodology survey on the	Monthly and six-monthly	Unknown

	Rivers and waterways, Oceans (Sea surface)	River, shoreline, inland, and offshore		
Indonesia	Shorelines and coastal environments	Marine Litter Monitoring (Directorate of Coastal and Marine Pollution and Degradation Control, MoEF Indonesia).	Annually or biannually	26 locations in Indonesia (National)
Indonesia	Rivers and waterways, Oceans (Sea surface), Biota	Identification of microplastic on the seawater, biota, and lake	Annually	Provincial/regency
Indonesia	Shorelines and coastal environments	Ocean Conservancy ICC	Annually	Varied
Indonesia	Oceans (Seafloor)	Project AWARE Dive Against Debris program	No regular time frame / 16 events organized	Varied
	Malaysia n= 5			
Malaysia	Shorelines and coastal environments	Tropical Research and Conservation Centre in Sabah	Throughout year	Pom Pom Island and Kalapuan Island Sabah
Malaysia		Stocktake report on marine plastic pollution in the Coral Triangle and to provide potential strategies to minimize it	*This programme is just beginning but planned to be a continuous effort*	Multijurisdictional effort including Malaysia, Indonesia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste
Malaysia	Other	Detection of microplastics in human colectomy specimens	Continuous effort from 2019	Selected colorectal patients in Malaysia
Malaysia	Oceans (Seafloor)	Project AWARE Dive Against Debris program	Many throughout year	Various locations but concentrated in key coral reefs, including Mabul Island, Tioman Island and Semporna

Malaysia	Shorelines and coastal environments	Ocean Conservancy ICC	Annually	Various locations across Malaysia
	Philippines n= 4			
Philippines	Rivers and waterways	Adopt-an-estero Waterbody Program	Unknown	Entire country
Philippines	Shorelines and coastal environments, Rivers and waterways	Manila Bay Clean-up Program	Unknown	The Manila Bay area covers eight (8) provinces and 178 local government units in three regions of the country, namely: National Capital Region (NCR), Region III, and Region IV-A. Of the eight provinces, four are coastal (Bataan, Bulacan, Cavite and Pampanga); four are non-coastal (Laguna, Nueva Ecija, Rizal and Tarlac).
Philippines	Shorelines and coastal environments	Ocean Conservancy ICC	Annually	Unknown
Philippines	Oceans (Seafloor)	Project AWARE Dive Against Debris program	Regular throughout year	Many locations throughout Philippines
	Republic of Korea n= 4			
Republic of Korea	Shorelines and coastal environments	Korea National Beach Litter Monitoring Program	Bimonthly for 13 years	100 m length of coastline at 40 sites nationwide. Please see the guideline attached Start at 20 sites and increase to 40 sites from late September 2014
Republic of Korea	Shorelines and coastal environments	Ocean Conservancy ICC	Annually	Clean-ups conducted at many sites by Our Sea of East Asia Network (OSEAN) and KOEM
Republic of Korea	Oceans (Seafloor)	Project AWARE Dive Against Debris program	No regular time frame	Various locations. Many conducted at Chilpo Beach
Republic of Korea	Shorelines and coastal environments, Oceans (Sea surface and seafloor)	Microplastic distribution status Monitoring	Twice annually for beach and seawater. Annually for seafloor and biota (oyster).	Entire country: 40 sites for beach, 50 sites for seawater, sea bottom, and biota
	Singapore n= 5			

Singapore	Shorelines and coastal environments	International Coastal clean-up Singapore (ICCS)	Annually, 60 - 90 minutes duration, 70-90 organizations, ~3,500 volunteers	Entire country
Singapore	Oceans (Seafloor)	Our Singapore Reefs (OSR)	5 -6 times a year, 2 dives (60 mins each) per sessions. 20 - 30 volunteers each time.	Southern Islands
Singapore	Oceans (Seafloor)	Project AWARE Dive Against Debris program	Occasionally	Pulau Hantu and Lazarus island
Singapore	Shorelines and coastal environments	Coastal clean-ups in mangrove environments by Little Green Men Singapore	Typically, monthly unless delayed by unpredictable events like haze or COVID-19. Each clean-up takes place over 2 hours, including briefing, set up, clean-up, debrief, and at times a brief tour of the site.	Mangrove sites, usually along a 50 metre stretch in Singapore. Site varies from clean-up to clean-up, but has been regular in 2019 (Sungei Seletar) and 2020 (Sungei Buloh Wetland Reserve).
Singapore	Shorelines and coastal environments	Cleaning of selected beaches	Beaches under NEA purview are cleaned through the year with frequencies ranging from four times a week to once in two weeks depending on the public usage and accessibility of the beach. The cleaning frequency is increased twice a day for	Selected beaches covering small sections of the coastline.

			selected beaches during monsoon periods as more marine litter are washed ashore.	
	Thailand n=7			
Thailand	Shorelines and coastal environments	Monitoring on Marine Debris in the Gulf of Thailand generated from Major Waterways	Quarterly	Along the coastal area of the Gulf of Thailand
Thailand	Ocean (water column and seafloor)	Monitoring on Microplastic in sea water column and sediment in the Gulf of Thailand and Andaman Sea	Biannually	Along the coastal area of the Gulf of Thailand and Andaman Sea
Thailand		Amount of marine debris	Annually	The Gulf of Thailand and Andaman Sea
Thailand	Shorelines and coastal environments	Beach Clean-Up	Annually	Along the coastal area of the Gulf of Thailand and Andaman Sea
Thailand	Biota	Plastic Debris in Endangered Marine Animals	Occasionally	Along the coastal area of the Gulf of Thailand and Andaman Sea
Thailand	Oceans (Seafloor)	Project AWARE Dive Against Debris program	Commonly throughout year	Various locations with many occurring at Ao Nang
Thailand	Shorelines and coastal environments	Ocean Conservancy ICC	Annually	Various locations
	*Viet Nam n= 3**			
Viet Nam	Oceans (Seafloor)	Project AWARE Dive Against Debris program	Commonly throughout year	Various locations though mostly occurring at Nha Trang and secondarily, Duong Dong
Viet Nam	Shorelines and coastal environments	Ocean Conservancy ICC	Annually	A few locations around Viet Nam
Viet Nam	Rivers and waterways	COMPOSE project Creating an Observatory for Measuring Plastic Occurrences in	Every 3 months	Twenty-two locations around Viet Nam

	Society and Environment		
Viet Nam	TBC	TBC	TBC

e. Summarizing existing monitoring activities

Across COBSEA member countries, there are many active marine litter monitoring programmes. Some monitoring programs occur secondary to well-known international clean-up programs, including the Ocean Conservancy International Coastal clean-up and Project AWARE Dive Against Debris, which operate in most of the COBSEA participating countries. Some countries have specific marine litter monitoring programs, either based on an international litter monitoring methodology, such as CSIRO's Global Plastic Leakage Baseline Project, or a customized monitoring effort at either a national or local/habitat scale. The most comprehensive marine litter monitoring programme occurs in the Republic of Korea, with bimonthly monitoring at 40 sites across the country.

i. Ocean Conservancy's International Coastal Clean-up (ICC) programme

There are active Ocean Conservancy's ICC activities occurring across the nine COBSEA participating countries (though to a lesser degree in Cambodia). In all countries, part or all of ICC clean-up activity is conducted in a non-representative method (locations are selected by participants rather than pre-selected for representativeness) by a combination of individuals, community, and corporate groups and organizations. In some countries, larger dedicated organizations, especially environmental NGOs, for example, 'Marine Conservation Philippines' in the Philippines and 'Our Sea of East Asia Network' (OSEAN) in the Republic of Korea, perform more delineated and representative ICC clean-ups of the same coastline annually. In Singapore, the ICC has been adopted into a national model, 'International Coastal Clean-up Singapore', that covers sites across most of Singapore's coastline.

ii. Project AWARE's Dive Against Debris (DAD) Programme

Project AWARE's Dive Against Debris programme operates in most COBSEA countries including Cambodia, Indonesia, Malaysia, Philippines, Republic of Korea, Singapore, Thailand and Vietnam. Some countries have very regular seafloor clean-ups occurring, predominantly occurring on coral reefs near towns with a tourism-strong economy.

iii. CSIRO's Global Plastic Leakage Baseline Project (GLBP)

Baseline surveys for the CSIRO GLBP have occurred across several COBSEA partner countries, though are less wide-spread and have not been conducted in an ongoing manner after initial baseline surveys. Viet Nam and the Republic of Korea have completed two surveys and Indonesia and China have each completed one survey. There are future surveys anticipated within Malaysia, Philippines, Singapore and Thailand.

iv. National-scale Litter Monitoring Programmes

The Republic of Korea, the People's Republic of China and Singapore have the most well-developed national-scale marine litter monitoring programmes of the surveyed COBSEA partner countries. The 'Korea National Beach Litter Monitoring Program' occurs bi-monthly across 40 sites. The People's Republic of China conducts a comprehensive annual 'China National Marine Litter and Microplastics Monitoring Project', conducted alongside other water quality monitoring programmes at hundreds to thousands of sits across the country's coastal and estuarine regions. In Singapore, the Ocean Conservancy ICC has organized into a national ground-up marine debris monitoring program, 'International Coastal Clean-up Singapore (ICCS)', that cleans and records the data from 20,000 metres along Singapore's shoreline.

Thailand conducts a number of national monitoring programmes across varied habitats; coastal, sediment, sea surface and biota. The Philippines has two national clean-up programmes, 'Adopt An Estero' and the 'Manila Bay Clean-up Program', which aim to remove litter from the waterways but

do not include a monitoring component. National-scale monitoring programmes are under-represented in other COBSEA participating countries.

v. Local or Habitat-scale Litter Monitoring Programmes

Local and habitat-scale monitoring programmes are common among COBSEA countries, with a multitude of programs tackling marine litter in a multitude of habitats, often with little synchrony between locales. A majority of the 99 one-off survey programmes constitute local or habitat-scale monitoring. Some habitats are popular for ongoing monitoring efforts, particularly coral reefs.

f. Reviewing ongoing monitoring activities in COBSEA countries

Here we review the ongoing monitoring efforts and programmes in each country, as far as provided, along the five tenets for designing national and regional scale marine litter monitoring programmes discussed in Part I.

i. Clearly delineated and repeatable methods

Most of the monitoring programmes have delineated and repeatable methods, though some do not, especially programmes where the focus is cleaning up litter rather than surveying. Some COBSEA participating countries have very thorough instructions available online, such as the 'Korea National Beach Litter Monitoring Program' while others are at earlier stages of delineating and designing their national programmes.

ii. Quantification and reporting findings in a way that is harmonized with other surveys and uses policy-relevant categories, as best as possible.

The major monitoring programmes conducted across multiple countries (OC's ICC, PA's DAD and CSIRO's GLBP) report their findings by quantifying specific items, though some clean-up and monitoring programmes report by mass of removed debris. The quantification categories are compatible between surveys for most items across OC's ICC, PA's DAD and CSIRO's GLBP, and compatible with the other national monitoring programs, such as the 'Korea National Beach Litter Monitoring Program'. Reporting mass of items removed is less frequently recorded. Such efforts, unless paired with item counts, do not distinguish between a wet or dry mass of litter items. Mass alone is seldom a valuable reporting metric for designing policy, as it does not provide important information on the composition of litter, and because different items have different masses, mass is not informative with regard to the accounts of particular items. For example, one large discarded metal item, such as a vehicle part or household appliance, may weigh as much as thousands of plastic bags, or hundreds of thousands of plastic fragments. This is an important point to consider with respect to survey design and data collection.

iii. Representative capture of variation within each habitat to avoid sampling bias.

The representative capture of variation within each habitat is mixed. The Republic of Korea, People's Republic of China and Singapore's national monitoring programs achieve this goal in shorelines and coastal environments, as do the countries that have conducted baseline surveys using the CSIRO's GLBP.

In the two most monitored habitats, shorelines and seafloor, other monitoring programs do not capture variation within habitats. Shoreline habitat surveys are biased towards the monitoring of level, easily accessible sandy beaches and the monitoring of coral reefs typically takes place in seafloor habitats.

The most widespread programmes, OC's ICC and PA's DAD, are designed as clean-ups and community engagement events, with monitoring as an auxiliary objective. Consequently, these programs do not explicitly account for randomization of site location, replication within sites, stratification within sites and randomization within sites (see Table 1). However, some administering organization of these programs, such as Our Sea of East Asia Network (OSEAN) in the Republic of Korea, have scheduled OC IPP activities geographically in such a way to provide representative capture of variation within each habitat.

iv. Accounting for data collection effort.

Most of the surveys record survey effort, such as the number of participants, the distance or area cleaned and the duration of the clean-up/survey (duration being the least reported metric), however few specifically control for survey effort. The most widespread clean-up methods, OC's ICC and PA's DAD, are designed as clean-ups and encourage community participation as their primary goals, in addition to litter removal, and monitoring is secondary. Consequently, they do not inherently account control for survey effort and detection probability (see Table 1).

v. Representation of different habitats

Shorelines and coastal environments are well represented across the participating countries ongoing monitoring programs, and to a lesser extent, seafloors through PA's DAD program, though with lower representation outside of coastal coral reefs. Oceanic near-shore environments, both the sea surface and seafloor, are well-represented in the People's Republic of China's National monitoring programme. Rivers and waterways are represented well in programs that include CSIRO's GLBP, and in some OC ICC clean-ups. In addition to coastal and coral reef monitoring, sea surface, sediment and biota monitoring programs are conducted in Thailand, which has the most representative habitat sampling programme of COBSEA participating countries. Overall, sea surface and biota sampling are under-represented across COBSEA participating countries.

g. Successes, gaps, and opportunities in COBSEA monitoring activities

i. Successes

It is promising that all nine countries are already conducting monitoring activities of one variety or another. Two specific clean-up programmes provide a source of secondary monitoring across two different habitats. Ocean Conservancy's ICC programme of coastal/shoreline habitats and Project AWARE's DAD programme of seafloor habitats, are well established across most participating countries, providing an opportunity for harmonizable monitoring. Several countries, exemplified by the Republic of Korea, have high quality marine litter monitoring programs already established, providing a template of success that others may choose to follow. Likewise, CSIRO's GLBP programme has been conducted across several COBSEA partner countries and is planned in others, providing an alternative template that meets the five tenets for designing national and regional scale marine litter monitoring programmes, and has additional ancillary benefits associated with its robust design. The data output of Ocean Conservancy's ICC, Project AWARE's DAD, the Republic of Korea's National Beach Litter Monitoring Program and CSIRO's GLBP can be harmonized across data categories, providing the opportunity for transboundary monitoring programmes.

ii. Gaps

In most participating countries, there is a gap for representative capture of variation within each habitat to avoid sampling bias, and representation of different habitats. For example, most coastal/shoreline monitoring of different countries in biased in favour of sandy beach monitoring, and seafloor surveys are biased in favour of coral reef monitoring. These leave other habitats, such as rocky, pebbled, slab, or muddy coastlines, and mangroves and rocky seafloors unrepresented. Across jurisdictions there is a gap in monitoring rivers and waterways, ocean (sea surface and water column) and biota (with some exceptions, for example PRC, Thailand and Indonesia), though the initiation of new monitoring programs, such as microplastic monitoring in ROK, will fill some of these gaps. Malaysia's monitoring programme included a microplastic and human-health monitoring programme, which is unique among programmes.

iii. Opportunities

Two widespread monitoring activities, Ocean Conservancy's ICC and Project AWARE's DAD, can be guided in such a way that can provide useful monitoring information by including stratification, randomization and replication to the programme. There are examples within two COBSEA participating countries where this has been effectively implemented, providing a template for success. To better sample under-represented habitats using a method that meets the five tenets for designing national and regional scale marine litter monitoring programmes, we recommend expansion of survey programmes that are already established in the region, for example 'Korea National Beach Litter Monitoring Program' the CSIRO GLBP programme.

Part III Recommendations for harmonizing marine litter monitoring

In part III of this report, we provide recommendations for harmonization of national monitoring programmes based on the regional marine litter monitoring inventory and country input.

11. GENERAL RECOMMENDATIONS FOR COBSEA PARTICIPATING COUNTRIES

a. Recommendations overview

It is important to acknowledge there are a number of actions and activities taking place within the region, with many opportunities for countries to engage with both COBSEA and ASEAN regional frameworks and global processes. Regional guidance provides targeted recommendations based on country input, existing efforts in the region, and regional priorities recognizing global guidance and international processes to enable peer learning and avoid duplication. A core focus in developing this guidance has been to ensure there is no replication of efforts and there is a strong focus on harmonization of approaches and ensuring consistency (and expansion) of information and guidance.

We recommend COBSEA countries benefit from opportunities already provided by existing programmes. By leveraging the successes of existent programmes and bridging the gaps, harmonization of COBSEA monitoring programmes can be achieved through making small changes to existing efforts, following examples already implemented by some countries. Overarchingly, we recommendation to improve attention to reporting of survey efforts across all monitoring programmes and, where possible and appropriate, align data sheet reporting categories for comparability within and between regions. Two clean-up activities that are already widespread, Ocean Conservancy's ICC and Project AWARE's DAD, can be adapted in such a way that each can provide useful monitoring information by including stratification, randomization, and replication to the programme. To better sample underrepresented habitats using a method that meets the five tenets for designing national and regional scale marine litter monitoring programmes, we recommend the adoption and expansion of survey programmes that are already established in the region, for example the CSIRO GLBP programme. Introduction of monitoring of currently under-represented compartments, including biota, is also recommended.

b. Attention to timing of surveys

One question that is often front of mind is the consideration of when to conduct surveys or monitoring efforts. International or National Clean Up days may be when surveys are initially conducted, though given the seasonality and differences in rainfall throughout the year within the region, knowing when to monitor becomes important. We know that after a big rainfall event such as occurs at the beginning of the monsoon season, a large 'flush' for flux of litter flowing along rivers or watercourses is often seen on its pathway to the sea. If there is capacity to survey a single time during the year, and a goal is to compare changes annually, it is important to survey each year during the same time window. If there is capacity to conduct multiple surveys throughout the year, we would suggest surveys pre-monsoon or rainy season and after the 'first flush' of major rains (consider this an opportunity for a BACI approach). If it is possible to survey 3-4 times per year, we would encourage spacing those surveys in time, so they occur regularly throughout the year – approximately every 3-4 months. If it is possible to survey monthly, we would encourage surveying at a similar time of the month for the duration of the monitoring period. What is achievable and what is optimal in terms of frequency of survey occurrence depends upon the key questions one is trying to answer, in alignment with the resources and capacity available.

c. Attention to surveys that include litter that may enter waterways and move to the coastal/marine environment

There is increasing acknowledgement and understanding of the role of waterways in the transport of litter from land to sea (Lebreton et al. 2018; Meijer et al. 2019). With that, we see a rising interest in identifying monitoring approaches that support a better understanding of how waste flows across freshwater (riverine) systems to the coastal and marine environment. We recommend a monitoring approach that encompasses a whole-of-watershed approach to survey design and monitoring, by including surveys across the available land types within a watershed, surveys along watercourses (rivers/creeks/streams) within the watershed, and coastal and nearshore surface surveys as well. The use of stratified random design, whilst accounting for site accessibility, and using multiple transects at each site, enables a robust, yet rapid approach to survey the landscape to understand

how waste flows across habitat types to the sea. This is the approach that has been developed by CSIRO. It has been implemented and undertaken in multiple watersheds/cities/countries within the COBSEA region (and beyond). By aligning with this approach, countries are able to compare their results with other countries within the region, as well as within the broader global context.

d. Attention to reporting survey effort across monitoring programmes

We recommend attention to reporting of survey effort across all monitoring programmes. Many of the one-off and ongoing programmes already include at least one measure of survey effort, however these effort mechanisms are not consistent nor are results always standardized with attention to differing survey effort, leading to different results (see 9.1).

We recommend that each survey/monitoring programme, at a minimum, report:

1. The area (m^2 or km^2) surveyed and length of the survey (m or km) if following a boundary such as river or shoreline.
2. The number of surveyors
3. The duration of the survey, reporting start and end time.

The inclusion of just these three measures of effort across surveys will greatly aid multijurisdictional harmonization efforts.

e. Attention to aligning the data reporting categories of national monitoring programmes

There are numerous, high-quality national-scale monitoring programmes already being conducted in COBSEA participating countries, including the Republic of Korea, the People's Republic of China and Singapore. However, the data reporting categories differ slightly between these, compromising comparability of data. We recommend aligning reporting categories so that they are consistent with agreed lists of categories, such as the EU-MSFD (Directive, 2013) (Guidance on Monitoring of Marine Litter in European Seas (europa.eu)). If it is not feasible to broadly harmonize survey reporting categories, we recommend include/harmonizing at least across key policy-relevant items to allow direct regional comparisons across key common and policy-relevant items. Examples might include the top 10 most common items, identified globally, in the Ocean Conservancy and Project AWARE clean-ups.

The 10 most common litter items, presented in rankings on land and seafloor respectively, were cigarettes (1st and 15th), plastic fragments (2nd and 3rd), fishing line (20th and 1st), plastic beverage bottles (4th and 5th), food wrappers (3rd and 7th), metal cans (8th and 4th), glass bottles (10th and 6th), plastic bottlecaps (5th and 14th), plastic bags (7th and 9th) and synthetic foam (6th and 17th) (Roman et al. 2020). However, including more categories is useful, as trends may change in space and time. CSIRO's approach utilizes categories similar to the ICC and DAD methods, specifically for harmonization.

Available guidance: GESAMP Chapter 2.4. Types of plastic marine litter and 3.3.2. Marine litter categories.

CSIRO's handbook of Survey Methodology (2018). CSIRO, Australia. ePublish EP178700

The Marine Strategy Framework Directive (MSFD). Guidance on Monitoring of Marine Litter in European Seas

United Nations Environment Programme (2020). Monitoring Plastics in Rivers and Lakes: Guidelines for the Harmonization of Methodologies. Chapter 8.1 Categories of plastics in freshwater.

f. Adoption and expansion of programmes already operating in the region that fulfil the five tenets for designing national and regional scale marine litter monitoring programmes

Adoption of and expanding on national studies that that fulfil the five tenets for designing national and regional scale marine litter monitoring programmes, and have already been conducted regionally, provides a valuable starting point to guide future monitoring efforts. There are two examples of ongoing and one-off baseline monitoring programmes operating within COBSEA participating countries that we recommend as suitable for adoption and expansion into ongoing monitoring programs (for example, annual or biannual programmes) in other jurisdictions. First, for coastal habitat monitoring, the Republic of Korea's "Korea National Beach Litter Monitoring Program" exemplified the five tenets for designing national and regional scale marine litter monitoring programmes. This approach would serve as a valuable template for monitoring programmes in other COBSEA participating countries. Second, CSIRO's Global Plastic Leakage Baseline Project monitors debris across several habit styles and baselines have been established already for China, Republic of Korea, Viet Nam and Indonesia, with future collaboration and data collection exercises anticipated in Cambodia, Malaysia, Philippines, Singapore and Thailand.

i. Republic of Korea's "Korea National Beach Litter Monitoring Program" (Coastlines only)

The Republic of Korea's "Korea National Beach Litter Monitoring Program" is a quality national marine litter monitoring programme that could be adopted in other jurisdictions. Meeting the five tenets for designing national and regional scale marine litter monitoring programmes, this well-designed coastal litter monitoring programme could serve as a template of bi-monthly monitoring for COBSEA participating countries.

ii. CSIRO's Global Plastic Leakage Baseline Project (Inland, Coastlines, Rivers and waterways, Ocean- Sea surface)

Expanding on national baseline studies that have already been conducted provide valuable starting points for the expansion and adoption of national monitoring programmes. The CSIRO's Global Plastic Leakage Baseline Project is designed to survey several habitats: coastlines, inland areas, rivers and waterways and ocean (sea surface), with surveys already undertaken across numerous countries globally, including several of the COBSEA participating countries, as well as in other countries in Africa, the Americas and beyond. Meeting the five tenets for designing national and regional scale marine litter monitoring programmes and having already been conducted as a baseline survey across multiple COBSEA participating countries, expansion of the CSIRO GLBP survey programme offers a quality survey programme to expand across the region for national marine litter monitoring. Importantly, it allows countries insight into how waste flows from land to the sea, incorporating watershed level surveys across different land use types as well as surveys along watercourses to better understand how water influences litter lost to the environment and where such litter arrives at the ocean.

g. Programmes that fulfil the five tenets for designing national and regional scale marine litter monitoring programmes in biota

Biota are under-represented in surveys throughout COBSEA participating countries, with only Thailand and Indonesia conducting an ongoing programme of monitoring plastic in endangered marine animals, though the Republic of Korea plans to initiate an annual oyster microplastic monitoring programme. Among one-off surveys, biota monitoring is popular and universities across several COBSEA participating countries have conducted surveys of both edible biota and wildlife. We recommend the expansion of ongoing marine litter-biota monitoring programmes, to address particular questions that countries may have, such as the question of food security and impacts on human health from edible biota.

i. Edible biota

There are several surveys conducted that sample edible biota in COBSEA participating countries. Microplastics surveys of invertebrates include a fMRIG-FSSM-Universiti Malaysia Terengganu survey, sampling wild and farmed sea cucumber (*Holothuria scrabra*) for ingested microplastics, and cultured edible bivalves have been surveyed in Bacoor Bay, Cavite, Philippines. For surveys of fish,

several universities within Malaysia including the Universiti Sains Malaysia and Universiti Putra Malaysia, conducted surveys of microplastics in the gastrointestinal tracts of multiple fish species, destined for human consumption, purchased from markets. A collaborative study between Universiti Putra Malaysia; Monash University Malaysia and HORIBA Jobin Yvon S.A.S. investigated microplastics in the gastrointestinal tracts of in 20 brands of canned sardines and sprats across 13 countries. These and comparable surveys of edible biota can be instituted as part of national marine litter monitoring programmes. We recommend that edible biota monitoring follows five tenets for designing national and regional scale marine litter monitoring programmes. For example by sampling the complete gastrointestinal tracts of multiple species across multiple jurisdictions and recording data in a similar manner, comparison can be made among taxa and/or regions. Purchase of edible biota directly from fisherman and suppliers that source their catch in different seas or waterbodies affords a minimally resource intensive sampling opportunity.

ii. Wildlife

Opportunistic wildlife sampling can occur through beach-patrol efforts that are likely to come across moribund or deceased wildlife as a normal part of their patrolling activities, as well as through collaboration with wildlife rescue organizations. Marine wildlife conservation, rescue and rehabilitation NGOs operate in multiple COBSEA participating countries, and partnerships with such organizations, such as by the institution of a wildlife – marine litter interaction database or 'strandings database', can collate the efforts of multiple disparate groups. Examples among one-off surveys in COBSEA participating countries include a survey to assess impacts of plastic debris on marine turtle found in Davao Gulf in the Philippines, and the 'Juara Turtle Project' in Malaysia, which conducts opportunistic sampling of stranded green turtles (*Chelonia mydas*), dissection and analysis of gut contents.

We recommend that such strandings databases or programmes follow the five tenets for designing national and regional scale marine litter monitoring programmes. If standings databases are instituted, is important to include records of all wildlife stranding, if possible, including survey effort (for example, in the case of a beach patrol scheme, the distance and regularity of patrols), and records of strandings that are not associated with marine litter. It is valuable to look at other ongoing wildlife stranding databases to ensure the best interoperability possible. Collating data related to strandings provides information that can help to accurately determine the magnitude of the threat that marine litter poses to wildlife, rather than simply recording positive or marine-litter-interaction-only records. However, there is a vast and rapidly growing literature on the impacts of marine debris on coastal and marine fauna, so the demonstration of harm has already been shown across regions, taxa, and impact types. Hence, this may not be of highest priority for establishment of national and/or regional monitoring programmes.

Available guidance: GESAMP Chapter 7. Monitoring methods for marine biota.
United Nations Environment Programme (2020). Monitoring Plastics in Rivers and Lakes: Guidelines for the Harmonization of Methodologies. Chapter 5.6 Sampling of freshwater biota.

12. SPECIFIC RECOMMENDATIONS FOR PROGRAMMES CURRENTLY CONDUCTED ACROSS MULTIPLE COBSEA PARTICIPATING COUNTRIES

Two clean-up activities are already widespread in COBSEA participating countries, with a data history that reaches back for many years, and an easy-to-understand template that has been designed with community participation, outreach and environmental stewardship as key objectives. The Ocean Conservancy's ICC and Project AWARE's DAD programmes can be adapted in such a way that can provide useful monitoring information by including stratification, randomization, and replication to the programme making these few simple adjustments and improvements to coastal clean-ups, data can be collected in a more robust and representative way and inform national monitoring efforts. But beyond contribution to data collection, these clean-ups also have high value for awareness raising and community engagement and aspects of practicality and choosing simple 'user friendly' approaches should be considered when organizing such efforts. Here we make some specific recommendations to build on the efforts already undertaken to leverage these programmes for effective monitoring of local anthropogenic litter. Note that CSIRO's approach builds on these simple citizens science activities, with an increased level of robustness and analytical capability.

a. Representative survey design recommendations for implementation of Ocean Conservancies 'International Coastal Clean-up' programme (Coastlines)

Given that the Ocean Conservancy's ICC programme is conducted in all participating countries, we recognize and opportunity to expand upon already existing programs. Following the example of Singapore's 'International Coastal Clean-up Singapore (ICCS)' and OSEAN's administration of OC ICC in Republic of Korea, we recommend the adoption of a stratified national programme of Ocean Conservancies 'International Coastal clean-up'. This could be administered by a reliable NGO, as is currently administered by OSEAN in the Republic of Korea, or by government. When designing a national survey programme, the programme is most effective when it accounts for randomization of site location, replication within sites, stratification within sites, randomization within sites, and improve control for survey effort and detection probability.

Simple adjustment example for representative sites: Are there sites within your local area or region that you'd like to monitor annually that are not well represented? For example, perhaps there are many events hosted on sandy beaches, but you would like to better understand and monitor all coastal habitat types, including mangroves? Work together with local ICC representatives, local government or community groups to pre-plan a selection of sites that represent different habitats to conduct, host or aid with an annual ICC event. Perhaps clean-ups at less popular sites can be incentivised, for example, by organising hot food or cold drinks for participants or engaging local community leaders. Pre-selecting key areas that meet broader monitoring goals and supporting the organisations that host clean-ups (or hosting them through your own organisation) can benefit community awareness of anthropogenic litter and foster stewardship while meeting monitoring goals.

This approach of pre-selecting ICC sites for annual monitoring is exemplified by the national ground-up marine debris monitoring programme in Singapore, 'International Coastal clean-up Singapore (ICCS)', an idea template that could be expanded on in other COBSEA participating countries.

i. Recommendation to improve randomization of site locations in OC's ICC

Most OC ICC programmes are conducted on sandy beaches near populated regions/city centres. To improve randomization of the site location, we recommend to "suggest sites" or that a pre-selection of sites is nominated by the local organizations responsible for OC ICC clean-ups. By nominating or pre-selecting sites before the clean-up date, representation of different types of sites (sandy beaches, rocky beaches, mangroves, riverbanks, will river deltas and other site types),

nearby and distant from populated areas, can be selected to support more representative monitoring outcomes using OC ICC data.

ii. Recommendation to improve replication within sites in OC's ICC

To improve replication within sites, we recommend a 'suggest site' or preselection (as above in "Recommendation to improve randomization of site location in OC's ICC"), for replication within site types this suggestion is made in addition to subdividing large site surveys into multiple smaller surveys. For these situations, where appropriate, we recommend undertaking multiple surveys with clear start and end points within the larger area, rather than one very large survey with tens to hundreds of participants. A minimum of three surveys at a larger site is ideal.

iii. Recommendation to improve stratification within sites and randomization within sites in OC's ICC

Most sites are not homogenous. For example, even a coastline that is mostly sandy beach might include a beach entrance section, a section near a car park, a modification such as a seawall, a section that is rocky or vegetated. It could also include a waterway outlet such as a drain or natural waterway, the coastline might be curved face different directions and/or experience different prevailing winds. To improve stratification and randomization within sites, especially large sites, we recommend dividing sites into smaller areas that each contain these different features. For example, a 6km coastline might contain 4km of wide sandy beach, half of which is more remote from the access point, a 1km seawall and 1km of vegetation. In a site of this variety, we recommend (if resources are available) a minimum of three surveys in advance of the clean-up activities; one for the sandy beach section, one that occurs by the seawall, and the third in the vegetated section. By stratifying and randomizing clean-ups within-sites, the survey data captures the type of within-site variation in marine litter that may occur due to the types of terrain and onshore forcing, for better information about local marine litter situations.

iv. Recommendation to improve control for survey effort and detection probability in OC's ICC

The OC ICC programme attracts a variety of individuals who might survey in different ways; some will walk briskly, perhaps chatting with friends, some may diligently search on hands and knees, looking under rocks and vegetation, and everything in between. Hence, within the clean-up area, search effort may not be constant. At a beach site, people may be more likely to walk along the wet sand or strandline, than to venture into dunes or coastal vegetation. At a river site, people may be more inclined to search at the top of the bank. Multiple participants may search along the same stretch within the survey site while all neglect another part of the survey area. We recommend that prior to surveys being conducted, the team agrees on a search methodology and divides participants' effort so that their search is evenly spread along the site, avoiding multiple teams of surveyors on some stretches while no teams survey others. This ensures consistent survey effort within the entire study area.

b. Representative survey design recommendations for implementation of Project AWARE's Dive Against Debris programme (Ocean - seafloor)

Project AWARE's Dive Against Debris programme is conducted in most participating countries, though dives are primarily targeted towards popular coral reefs near heavily touristed locations. We recommend expansion of existing PA DAD programs through collaboration with diving clubs and organizations to increase monitoring of seafloor debris, particularly in locations that are further offshore. When designing a national survey programme, the programme is most effective when it accounts for randomization of site location, replication within sites, stratification within sites, randomization within sites, and improve control for survey effort and detection probability.

i. Recommendation to improve randomization of site location in PA's DAD

Most PA DAD activities are conducted on coral reefs and popular dive sites near to tourist regions. To improve randomization of the site location, we recommend a "suggest sites" or pre-selection of sites through a collaboration with government or NGO organizations, Project AWARE coordinators and the dive organizations that host DAD programs. By nominating or pre-selecting sites before the

clean-up date, representation of different types of sites (sandy seafloors, rocky seafloors, muddy seafloors), nearby and distant from populated areas, can be selected to support more representative seafloor monitoring habitat types.

ii. Recommendation to improve replication within sites in PA's DAD

Overall, replication within surveyed coral reef and dive sites is very good in most locations where seafloor clean-up activities take place. However, there is currently a lack of site representation and within-site representation outside of popular coral reef dive sites. To improve replication within sites, we recommend a 'suggest site' or preselection (as above in "Recommendation to improve randomization of site location in PA's DAD"), for replication within site types, in addition to subdividing large survey areas into multiple smaller surveys, depending on the number of available divers. For these situations, where appropriate, we recommend undertaking multiple surveys with clear start and end points within the larger survey area, rather than conducting a single large survey with many participants. A minimum of three surveys at a larger site is ideal.

iii. Recommendation to improve stratification within sites and randomization within sites in PA's DAD

Most dive sites are not homogenous. For example, even a broader dive site may contain seafloor of different depths, different surfaces (rock, coral, mud, sand), different organisms (sponges, corals, algae/seaweeds, kelp gardens, seagrass). To improve stratification and randomization within sites, especially large sites, we recommend dividing sites into areas that contain different features. For example, a coral reef dive site may contain a mixture of coral structures spread across sand. In such a site, clean-ups could be split into coral seafloor clean-ups and sandy seafloor surveys/clean-ups. By stratifying and randomizing data collection associated with clean-ups within-sites, the survey data could capture the type of within-site variation that may occur due to the types of terrain and forcing, such as ocean currents, for better information about local marine litter types and densities.

iv. Recommendation to improve control for survey effort and detection probability in PA's DAD

Due to the nature of scuba diving, survey effort and detection probability is more even than in many land-based surveys, and underwater activities depend heavily on dive conditions such as visibility and the strength of currents, which affect divers equally during a single dive. Nonetheless, some divers will search more diligently than others, some divers are more capable than others, and may have increased skill in looking under rocks and in vegetation, while others might opt for visually searching while swimming at a distance above the seafloor. It is also possible, with pairs of divers, that some areas within the dive site are searched by multiple people while others are missed, leading to uneven search effort and detection probability. We recommend that prior to surveys being conducted, the team agrees on a search methodology and divides participants' effort so that their search is evenly spread throughout the site, avoiding multiple teams of surveyors on some areas while no teams survey others.

Simple adjustment example for survey effort: Interested in using local or national community clean-up surveys, such as Ocean Conservancy's ICC or Project AWARE's DAD as part of a monitoring programme but are not sure whether the local programme hosts control for survey effort or detection probability? How about supporting the event organisers in hosting annual "training" event or programme in the days to weeks before the event? By inviting experienced people or professionals to share their knowledge, survey techniques can be standardized by those that host and deliver programmes, so that the results of each survey/clean-up can be reliably compared between sites and over time.

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The Coordinating Body on the Seas of East Asia is dedicated to protecting the coastal and marine environment of the East Asian Seas for a sustainable future for all.

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Appendix 3 - Terms of Reference of the East Asian Seas Regional Node of the Global Partnership on Marine Litter

IV. Background

1. The Coordinating Body on the Seas of East Asia (COBSEA) Working Group on Marine Litter (WGML), at its first Meeting in December 2018, noted that the development of a Regional Node of the Global Partnership on Marine Litter (GPML) could address knowledge management and networking needs of the East Asian Seas region. Information on the development of a Regional Node and initial draft Terms of Reference were presented to the Twenty-fourth Intergovernmental Meeting of COBSEA (UNEP/COBSEA IGM 24/5). In the resolution adopted by the Meeting, COBSEA countries requested the Secretariat, in consultation with the WGML, to develop the East Asian Seas Regional Node of the GPML, for consideration by the Twenty-fifth Intergovernmental Meeting.

2. Proposed draft Terms of Reference of the East Asian Seas Regional Node of the GPML and opportunities to work with regional partners were discussed in a technical consultation of the WGML from 23-25 June 2020. Draft Terms of Reference were revised further based on Working Group inputs and circulated to COBSEA countries for further comment. As per WGML guidance, the Secretariat continued development of services of the Regional Node in cooperation with regional partners (including National University of Singapore, NUS, and the Regional Capacity Center for Clean Seas, RC3S) and the GPML (see Annex 1).

3. At the Third Meeting of the COBSEA WGML on 29-30 June 2021, Indonesia reaffirmed interest in exploring the role of RC3S as a host or co-host of the Regional Node, considering the strong alignment of RC3S' mandate on knowledge management, capacity building and awareness raising with objectives of the Node (see RC3S Working Agenda in Annex 2). The Secretariat presented revised draft Terms of Reference of the East Asian Seas Regional Node of the GPML and additional resources identified to support establishment of Node functions and structure, including through the SEA circular project, the Zukunft – Umwelt – Gesellschaft (ZUG) initiative through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and the Global Environment Facility (GEF) through Asian Development Bank (ADB), as contained in UNEP/COBSEA IGM 25/4.

4. At the Third Meeting of the COBSEA WGML, participating countries voiced support for the revised draft Terms of Reference and recommended their consideration for adoption by the Twenty-fifth Intergovernmental Meeting on 8-9 September 2021. Participating countries welcomed Indonesia's initiative related to the role of RC3S as host institution of the Regional Node and voiced a preference for an interim hosting arrangement including the COBSEA Secretariat to develop hosting arrangements, organizational structure, and a financial plan for the Regional Node, based on the revised Terms of Reference, once adopted. The document was presented to the Twenty-fifth Intergovernmental Meeting on 8-9 September 2021, revised further and finalized with input provided by and immediately following the Intergovernmental Meeting.

5. Upon adoption of the revised Terms of Reference, the Secretariat will work with the RC3S as advised by the WGML and submit a letter to the GPML Steering Committee expressing interest to establish and host the Regional Node. Upon acceptance by the Steering Committee, the GPML will provide seed funding and support for the establishment of the Node as needed. The Secretariat will work with the RC3S and WGML to establish organizational governance and operational structures of the Node with a view to transferring

hosting responsibilities to the RC3S and any co-hosting institutions. A workplan for the Node will be presented to part two of the Twenty-fifth Intergovernmental Meeting.

6. This document contains the revised Terms of Reference of the East Asian Seas Regional Node of the GPML as discussed at the Third Meeting of the COBSEA WGML. Participating countries are requested to consider adoption of revised Terms of Reference by silence procedure following part one of the Twenty-fifth Intergovernmental Meeting of COBSEA toward establishment of the Regional Node.

V. East Asian Seas Regional Node of the GPML – Revised Terms of Reference

1. The COBSEA Regional Action Plan on Marine Litter (RAP MALI) provides an overarching regional framework for addressing marine litter in the East Asian Seas as a transboundary issue. It promotes consolidation, coordination and facilitation of efforts towards integrated management of marine litter, comprising actions in relation to preventing and reducing marine litter from land-based as well as sea-based sources, monitoring and assessment, and creating enabling conditions.

2. Enabling conditions identified towards implementation of the RAP MALI include filling knowledge gaps through targeted research; adequate training, information sharing, outreach and public awareness; efficient and inclusive involvement of stakeholders; and adequate cross-sector, regional and international cooperation to leverage synergies between existing mechanisms and frameworks. Modalities for implementation of the RAP MALI include development of the COBSEA institutional framework, including knowledge management efforts.

3. The Global Partnership on Marine Litter (GPML) is a multi-stakeholder partnership that provides a global cooperation mechanism to prevent marine litter and microplastics, with the aim of sharing knowledge and experience and advancing solutions. Regional Nodes of the GPML create regional networks to address regional knowledge, capacity and networking needs and priorities, leveraging engagement across stakeholder groups and building on and providing linkages to the global-level framework provided by the GPML.

Objectives

4. The purpose of the East Asian Seas Regional Node of the GPML is to support implementation of the COBSEA RAP MALI by providing a regional marine litter knowledge management and networking mechanism. In doing so, the Regional Node will engage as well as support a range of stakeholders in efforts to address marine litter, recognizing that action across stakeholder groups is critical to successfully addressing marine litter, and that needs and interests vary across different groups of society.

5. The objectives of the Regional Node are:

    a. Enhance knowledge sharing, awareness and information exchange on sources, pathways and impacts of marine litter. The Regional Node will facilitate access to scientific evidence, tools, methodologies, training, and peer learning, and will seek to catalyse research and development addressing needs identified in the RAP MALI or by the WGML.

    b. Create an effective multi-stakeholder regional network and facilitate regional and international cooperation. The Regional Node will foster engagement and cooperation with government entities, research bodies, the private sector and civil society, exploring synergies and joint action to address identified needs and inform actions.

    c. Leverage additional resources for efforts in the region to address marine litter. The Regional Node will identify opportunities and demand for project development, supporting fundraising for activities addressing priorities identified by the WGML and COBSEA IGM toward implementation of the RAP MALI as well as emerging needs, and where possible providing guidance and technical support to marine litter initiatives.

6. In pursuing these objectives, the East Asian Seas Regional Node of the GPML will promote the development and implementation of the GPML at the regional level.

Functions

7. The Regional Node provides knowledge management and networking services related to:

    a. *Pillar 1 – Marine litter policy and management*: Providing access to information on national and regional policy development in the context of the RAP MALI through development, maintenance and updating of an online knowledge repository. This will capture reporting by participating countries through the WGML and may encompass information on good practices, tools and technologies for the management and prevention of marine litter, as well as on initiatives to address marine litter.

    b. *Pillar 2 – Marine litter science*: Facilitate enhanced networking among academic and research institutions in the region to catalyse new research on marine litter that addresses policy and management priorities and enables impactful application of science in decision making. This will also entail providing broad access to marine litter research findings through a searchable online catalogue.

    c. *Pillar 3 – Marine litter capacity building*: Provision of capacity support activities, including facilitating access to and use of capacity building and outreach resources (in English as well as languages of the region), and where possible developing and implementing capacity building activities (e.g. relevant materials, web-based tools, peer learning mechanisms, online and in-person training) focusing on identified priorities and gaps.

Governance and institutional arrangements

8. The Terms of Reference of the East Asian Seas Regional Node of the GPML and any changes to these are approved by the Intergovernmental Meeting of COBSEA. The COBSEA WGML provides recommendations on the work of the Regional Node and supports activities of the Node through its biennial workplans as relevant. The COBSEA WGML may also provide recommendations on further development of the Node, its objectives and functions for consideration by the Intergovernmental Meeting. The GPML Steering Committee and Secretariat provide general guidance and advice on the operational programme and functions of the Regional Node where appropriate.

9. The Regional Node requires a sound institutional foundation for operational effectiveness and sustainability. As such, the Node should be hosted by an institution or combination of institutions with relevant mandate, necessary technical capacity, and demonstrated willingness to maintain and develop the Node. This may include existing regional bodies and may also entail co-hosting of the Node by the COBSEA Secretariat. Responsibilities and tasks of a host or co-hosts will be elaborated in agreements between the COBSEA Secretariat and the respective institutions, with due consideration of long-term operational stability.

10. The host institution(s) provides knowledge, capabilities, human resources and, where possible, financial resources to support maintenance, operational stability, and functionality of the Node. The institution(s) hosting the Node ensures delivery of the work of the Node including knowledge management and networking with partners as relevant. Therefore, adequate knowledge, professional staff with high qualification, and long-term, sustainable, predictable financial resources are key requirements for the host institution(s). The host institution(s) reports on progress made by the Node to the COBSEA WGML and Intergovernmental Meeting as well as to the GPML Steering Committee and Secretariat.

11. Possible hosting arrangements include:

    d. *One host institution*: The Node is hosted by one institution, such as a relevant regional organization.

    e. *Multiple host institutions*: Hosting responsibilities are shared among two or more co-hosts that fulfil specific functions of the Node in line with their mandate and expertise. Co-hosts may include different kinds of entities such as regional organizations, academic and research institutions, as well as the COBSEA Secretariat.

    f. *Interim or transitional hosting arrangements*: The COBSEA Secretariat may support hosting responsibilities ad interim to provide assistance to host institution(s) until hosting arrangements are confirmed.

Funding

12. The financial implications of hosting and maintaining a Regional Node are expected to be moderate.

13. In the initial phase of establishing the Regional Node, funding is required to support the development of Node functions and structures. At this stage, the Regional Node will utilize existing project funding for the development of knowledge management and networking services. Additional seed funding and knowledge management support is provided by the GPML toward establishing the Regional Node and linking it with global knowledge management efforts.

14. Additional funding has been identified for further development of functions, design, and web infrastructure of the Regional Node until end of 2024 to ensure comprehensive establishment of the Node and sound institutional arrangements in collaboration with the host institution(s).

15. Upon establishment of the Node, new projects will be developed by the host institution(s) and COBSEA Secretariat in coordination with the GPML to ensure availability and continuity of funding to support the Regional Node and its activities. The host institution(s) will provide capacity and/or financial resources to support maintenance, operational stability, and functionality of the Node, as appropriate.

16. The Regional Node will not incur costs to the COBSEA Trust Fund.

Annex 1. Activity plan – priority activities 2021/2022

(attached as separate file)

Annex 2. Regional Capacity Center for Clean Seas Working Agenda

(attached as separate file)

Appendix 4 - Workplan and budget for the biennium 2021-2022

Background

1. The Secretariat of the Coordinating Body on the Seas of East Asia (COBSEA) hereby submits the proposed workplan and budget for COBSEA for the biennium 2021-2022 to the Twenty-fifth Intergovernmental Meeting of COBSEA.

2. All United Nations Environment Programme (UNEP) trust funds, including those pertaining to Multilateral Environmental Agreements have been established in accordance with Article V of the General Procedures Governing the Operations of the Fund of UNEP and as such are governed by the Financial Rules of UNEP. UNEP Financial Rule 201.4 states that all matters not covered by the Financial Rules of UNEP are governed by the Financial Regulations and Rules of the UN (ST/SGB/2003/7).

3. The UN Financial Rules are supplemented by the specific procedures for the operation of COBSEA as adopted at the Twenty-second Intergovernmental Meeting of COBSEA (UNEP/DEPI/COBSEA IGM22/8).

4. The Regional Trust Fund for the Implementation of the Action Plan for the Protection and Development of the Marine Environment and Coastal Areas of the East Asian Seas Region (hereinafter referred to as the "East Asian Seas Trust Fund") was established upon the adoption of the relevant Action Plan in 1981. The Action Plan including its annexes – among them the Terms of Reference for the Trust Fund – was revised in 1994 as the Action Plan for the Protection and Sustainable Development of the Marine and Coastal Areas of the East Asian Seas region (hereinafter referred to as the "East Asian Seas Action Plan"). In decision EA.4/L.30 the United Nations Environment Assembly approved the extension of the East Asian Seas Trust Fund until 31 December 2022.

5. In Resolution 1, adopted by the Twenty-first Intergovernmental Meeting of COBSEA in 2013, participating countries agreed on the annual budget of USD 340,000 for COBSEA as the minimum financial requirement to maintain implementation of the East Asian Seas Action Plan and Secretariat services. The current level of total yearly contributions, as per communication from participating countries, is USD 325,000. As of 31 December 2020, a total amount of USD 632,254 has been received in contributions from governments to the Trust Fund during the period of 2019-2020.

6. It is brought to the attention of the participating countries that the implementation of the workplan 2021-2022 and related decisions is subject to fund availability.

7. The Twenty-first Intergovernmental Meeting of COBSEA (2013) agreed that the positions of Programme Officer (P3 level) and Senior Secretary (Administrative Assistant G6 level) would remain frozen until participating countries increased their contributions to the COBSEA Trust Fund to ensure sustainable operation of the Secretariat. The First Extraordinary Intergovernmental Meeting of COBSEA (2014) emphasized that the minimum level required to fulfil the duties of a COBSEA Coordinator was a P4 position, noting that most secretariats of Multilateral Environmental Agreements (MEAs) administered by UNEP had a coordinator at P5 level or above. The Twenty-second Intergovernmental Meeting of COBSEA (2015) agreed that the Secretariat would be staffed with a minimum of one professional staff at P4 level to coordinate the work of the Secretariat, assisted by one General Service staff at G6 level. The Twenty-third Intergovernmental Meeting of COBSEA (2017) agreed Terms of Reference for the recruitment of a COBSEA Coordinator at P4 level.

8. The position of COBSEA Coordinator was filled at the P4 level on 1 April 2019. Following the Twenty-fourth Intergovernmental Meeting of COBSEA (2019), the position of Programme Officer (P3) was re-established and filled as of 1 September 2020 using project funding, with the intention that the position be supported through the Trust Fund in the longer term. The position of Administrative Assistant (G5) remains filled and the position of Administrative Assistant (G6 level) remains frozen.

9. Considering the current level of country contributions and the accrued savings in the Trust Fund, the Secretariat proposes to unfreeze the Administrative Assistant (G6) position in 2022 to strengthen Secretariat capacity at minimal additional cost. Based on comments received by participating countries, the Secretariat proposes to retain the Coordinator position at P4 level for the time being to enable recruitment of a new Coordinator without further delay. The Secretariat invites discussion of a sustainable pathway to reverting the Coordinator position back to P5 level in the future to strengthen the functions of the COBSEA Secretariat and bring the staffing structure in line with that of the other UNEP administered Regional Seas entities. The Secretariat proposes to start phasing out the savings of USD 891,226 accrued in the Trust Fund in a transparent manner, as approved by the IGM and invites participating country proposals on the use of the Trust Fund for activities under the Strategic Directions 2018-2022 and/or to strengthen Secretariat capacity.

Trust Fund budget 2021-2022

10. The table below presents the proposed Trust Fund budget for the period of 2021-2022 (in USD):

Budget year		**2021**	**2022**
Coordinator (P4)[1]		198,300	198,300
Programme Officer (P3)[2]		-	-
Administrative Assistant (G5)		78,650	-
Administrative Assistant (G6)		-	80,000
Administration and other personnel		10,000	10,000
Sub-total: Personnel		**286,950**	**288,300**
Governance	COBSEA IGM 25[3]	10,000	30,000
Governance	Travel	-	15,000
Governance	Terminal evaluation of COBSEA Strategic Directions 2018-2022		10,000
Sub-total: Activities		**10,000**	**55,000**
Rent		20,600	20,600
Office equipment and misc.		2,000	2,000
Sub-total: Operation component		**22,600**	**22,600**
Grand total		**319,550**	**365,900**
13% Programme Support Cost (PSC)		41,542	47,567
Grand Total with PSC		**361,092**	**413,467**
Proposed use of Trust Fund savings		**(50,000)**	**(100,000)**
Grand Total		**311,092**	**313,467**

[1] *In 2021, the Coordinator P4 left the position on 18 April 2021. The actual expenditure recorded for 2021 is USD 36,615.*

[2] *The post of Programme Officer (P3) was re-established in 2020 but currently incurs no cost to the Trust Fund.*

[3] *The Twenty-fifth Intergovernmental Meeting of COBSEA will be held in two parts with the first part as a virtual event in September 2021 and the second part as an in-person meeting in Viet Nam as soon as possible in 2022.*

Workplan 2021-2022

11. The COBSEA Coordinator budget indicates the standard salary cost applicable to the Bangkok duty station from 1 January to 31 December 2021. The COBSEA Coordinator has remained vacant since 18 April 2021, and thus the estimated salary costs are USD 36,615 for 2021.

12. An interim Coordinator is in place until the position of COBSEA Coordinator is filled. The position of interim Coordinator is supported by UNEP and does not incur any cost to the COBSEA Trust Fund.

13. The Administrative Assistant (G5) position remains filled. This position has been budgeted accordingly for 2021, in line with standard salary cost applicable to the Bangkok duty station.

14. The position of Administrative Assistant (G6) remains frozen during 2021 and will be made available in 2022 in place of the current G5 position.

15. The position of Programme Officer Marine Litter (P3) currently does not incur costs to the COBSEA Trust Fund (see below).

16. Additional positions in the Secretariat currently use extrabudgetary funding and do not incur costs to the Trust Fund.

17. UNEP will continue to support the COBSEA Secretariat in functions pertaining to strategic planning, high level engagement and intergovernmental meetings as well as for the day-to-day finance and administrative management, from Headquarters (Nairobi, Kenya) and from the Regional Office for Asia and the Pacific (Bangkok, Thailand).

18. Provisions for covering operational costs in 2021-2022 have been made in keeping with current costs of rent and office equipment.

19. In view of the COVID-19 pandemic, no travel is envisioned nor budgeted for in 2021. Regional travel has been budgeted for 2022 for missions related to the implementation of the workplan, for the COBSEA Coordinator and Secretariat staff to meet COBSEA National Focal Points and relevant national high-level officials, and for participation in other relevant meetings such as the Global Meeting of the Regional Seas and the second UN Ocean Conference in 2022.

20. The Secretariat recommends that the second part of the Twenty-fifth Intergovernmental Meeting be organized in person as soon as possible in 2022 in Viet Nam.

21. Provisions for monitoring and evaluation of the COBSEA Strategic Directions 2018-2022 (paragraph 43) include carrying out a terminal evaluation in 2022 to evaluate performance of the present Strategic Directions and inform development of new Strategic Directions. An amount of USD 10,000 has been included in the budget for 2022 to support the external evaluation, which will be carried out in close consultation with the COBSEA Secretariat and participating countries. Participating countries may consider use of additional Trust Fund savings to support the evaluation of current Strategic Directions and development of new Strategic Directions.

22. As per the terms of reference of the COBSEA Working Group on Marine Litter (WGML) (paragraph vi), the WGML may provide recommendations to the Intergovernmental Meeting on revision of the COBSEA Regional Action Plan on Marine Litter (RAP MALI), as relevant and needed to address global developments,

such as decisions made by the resumed Fifth Session of the United Nations Environment Assembly (UNEA-5.2).

23. Implementation of this workplan will be funded primarily by the East Asian Seas Trust Fund, and by extrabudgetary sources as noted. An overview of project activities supported by extrabudgetary funding is described in UNEP/COBSEA IGM 25/4 and below.

24. Programme support cost is applied at the rate of 13 per cent on the expenditure incurred.

25. The working capital reserve is established at the level of 15 per cent of the average yearly budget for the biennium, in compliance with UN Rules and Regulations and UNEP Financial Rules, Article 8 (Rules 208.1; 208.2; 208.3) and Article 9 (Rules 209.1; 209.2; 209.3).

26. In case of timely collection of all COBSEA participating country contributions as per agreed contributions scale, the budget 2021-2022 will result in a decreasing balance of net assets position of the Trust Fund as of 31 December 2020 as presented below (in USD):

	Forecast 2021	**Forecast 2022**
Net Assets Entry Position	891,226	797,042
Contribution for the Year	325,000	325,000
Budget for the Year	(361,092)	(413,467)
Net Assets Closing Position	855,134	708,575
Working Capital Reserve	(58,092)	(58,092)
Net Assets Closing Position after reserve	**797,042**	**650,483**

27. It should be noted that, while a positive closing position is forecast in 2021 and in 2022 due to substantial savings under the Trust Fund, the proposed annual budget exceeds the expected income of the East Asian Seas Trust Fund. It is brought to the attention of participating countries that the Trust Fund does not ensure adequate staffing of the Secretariat required for effective operation in the longer term, even at the current staffing level of the Coordinator position. This is due in part to current yearly contribution levels not yet meeting the level agreed in Resolution 1 adopted at the Twenty-first Intergovernmental Meeting of COBSEA, and due to increases in standard staff costs and cost related to office space. In the current biennium, the proposal is to utilize USD 150,000 of the Trust Fund savings (USD 50,000 in 2021 and USD 100,000 in 2022) towards activities under the Strategic Directions 2018-2022 and the budget of a strengthened Secretariat. The accumulated fund balance/savings under the Trust Fund is projected to cover the consolidated costs of the COBSEA Secretariat for the next two biennia until 2026. While no increase in country contributions is envisaged for the current 2021-2022 biennium in light of countries' efforts to recover from economic impacts of the COVID-19 pandemic, countries may consider increasing annual contributions to the Trust Fund in the near future to address the current unsustainability of the Trust Fund.

28. To address sustainability of the Trust Fund, the Strategic Directions 2018-2022 (paragraph 36) recommend the development of a plan for strengthening resource mobilization and enhancing COBSEA Secretariat in terms of human capacity. This plan for strengthening resource mobilization and enhancing Secretariat capacity includes revising the scale of national contributions to the Trust Fund; establishing and resourcing an additional activity trust fund for the East Asian Seas Action Plan; developing framework funding agreements with bilateral or other donors; and placing emphasis on development and resourcing of regional projects addressing priorities in the COBSEA Strategic Directions and Regional Action Plan on Marine Litter (RAP MALI). The Secretariat will pursue this plan in consultation with participating countries for further discussion at part two of the Twenty-fifth Intergovernmental Meeting of COBSEA.

UNEP contributions to the COBSEA Trust Fund

29. UNEP provided in-kind support to the COBSEA Secretariat in 2019-2020 amounting to approximately USD 206,300, including 100 per cent of the interim COBSEA Coordinator salary from April 2019 to 31 December 2020 and in-kind contributions in the form of staff time.

30. During the period 2021-2022, it is estimated that UNEP will provide in-kind contributions through time dedicated by different staff members to COBSEA activities and projects, as follows:
    a. UNEP Ecosystems Division, Nairobi on strategic and programmatic functions (USD 113,114):
        - Chief of Ecosystems Integration Branch, D1 (USD 25,746)
        - Chief of Marine and Freshwater Branch, D1 (USD 10,298)
        - Coordinator, Global Programme of Action on the Protection of the Marine Environment from Land-based Activities, P5 (USD 22,176)
        - Programme Management Officer, Global Partnership on Marine Litter, P4 (USD 19,320)
        - Programme Management Officer, Global Partnership on Nutrient Management, P4 (USD 19,320)
        - Head of UNEP Regional Seas Programme Unit, P3 (USD 16,254)
    b. UNEP Asia Pacific Office, Bangkok on strategic and programmatic functions (USD 47,992):
        - Regional Director and Representative, D1 (USD 25,746)
        - Deputy Regional Director, P5 (USD 22,176)
    c. Administrative and fund management support from Nairobi (USD 35,574)
    d. Official missions by UNEP staff members to the region.

Extra-budgetary contributions

31. The table below presents allocated extrabudgetary funding for the period of 2021-2022 (in USD):

Budget year	**2021**	**2022**
Programme Officer Marine Litter (P3)	152,100	152,100
Associate Programme Officer (P2)	89,266	-
Sub-total: Personnel	**241,366**	**152,100**

32. The position of Programme Officer Marine Litter (P3) was filled from 1 September 2020 using extrabudgetary funding through the SEA circular project. Additional extrabudgetary funding for the position beyond 2022 has been identified as contained in UNEP/COBSEA IGM 25/4.

33. Two Associate Programme Officers joined the COBSEA Secretariat on 11 March 2019 and 9 October 2019 through lateral transfers for their third and fourth year of the Junior Professional Officer (JPO) programme supported by the Governments of Germany and Sweden. The Associate Programme Officer Marine Litter was funded through extrabudgetary resources (SEA circular project) from March 2020 to August 2020. The Associate Programme Officer Marine and Coastal Planning and Management and Governance was funded through extrabudgetary resources from October 2020 and left her position in August 2021.

34. COBSEA countries participating in the JPO programme are invited to consider seconding an Associate Programme Officer to the COBSEA Secretariat in 2021-2022 to further strengthen Secretariat capacity.

35. The COBSEA Secretariat will continue its efforts to mobilize extrabudgetary resources to complement the Trust Fund towards addressing needs and priorities identified through COBSEA and strengthen the capacity of the Secretariat. In line with the resolution of the Twenty-fourth Intergovernmental Meeting of COBSEA, the Secretariat has developed projects to support implementation of the Regional Action Plan on Marine Litter and COBSEA Strategic Directions. This will contribute to the Trust Fund for Support of the East Asian Seas Action Plan (QEL) which did not have any activities in 2019-2020 given the limited and remaining balance of USD 11,200.57. Projects underway and under development are presented in document UNEP/COBSEA IGM 25/4. The table below provides the estimated current and planned extrabudgetary funding in the current budget period, including for Secretariat personnel:

Project description	Duration	Source	Budget (USD)
Reducing marine litter by addressing the management of the plastic value chain in South-East Asia (SEA circular)[1]	2018-2022	Government of Sweden, Swedish International Development Cooperation Agency	6,371,784
Marine and Coastal Spatial Planning including Marine Protected Areas	2020-2021	Government of Sweden through UNEP	164,000
Nutrient Pollution	2020-2021	Government of Sweden, Ministry of Environment	60,000
Demonstrating integrated solid waste management to prevent marine litter in the East Asian Seas	2021-2022	United States Environmental Protection Agency under USEPA-UNEP umbrella agreement	220,478
Marine Litter Prevention through Reduction, Sustainable Design and Recycling of Plastic Packaging (MA-RE-DESIGN)	2022-2024	Government of Germany, Zukunft-Umwelt-Gesellschaft (ZUG) through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)	954,654[2]
Promoting Resource Efficiency and Circularity to Reduce Plastic Pollution for Asia and the Pacific	2021-2024	Global Environment Facility (GEF) through Asian Development Bank (ADB)	200,000

[1] *Implemented jointly with UNEP Regional Office for Asia and the Pacific.*
[2] *EUR 800,000 based on UN Operational Rate of Exchange (30 June 2021: 0.838).*

36. The COBSEA Secretariat will continue engagement with UNEP professional staff members based in Nairobi, Kenya and Bangkok, Thailand as well as global partnerships led by UNEP, such as the Global Partnership on Marine Litter (GPML), the Global Partnership on Nutrient Management (GPNM) and the Global Wastewater Partnership (GW^2I) and the Global Coral Reef Partnership to leverage technical and policy support.

Recommendation to the Twenty-fifth Intergovernmental Meeting

37. Participating countries are invited to consider the adoption of the revised workplan and budget 2021-2022 by silence procedure following part one of the Twenty-fifth Intergovernmental Meeting.