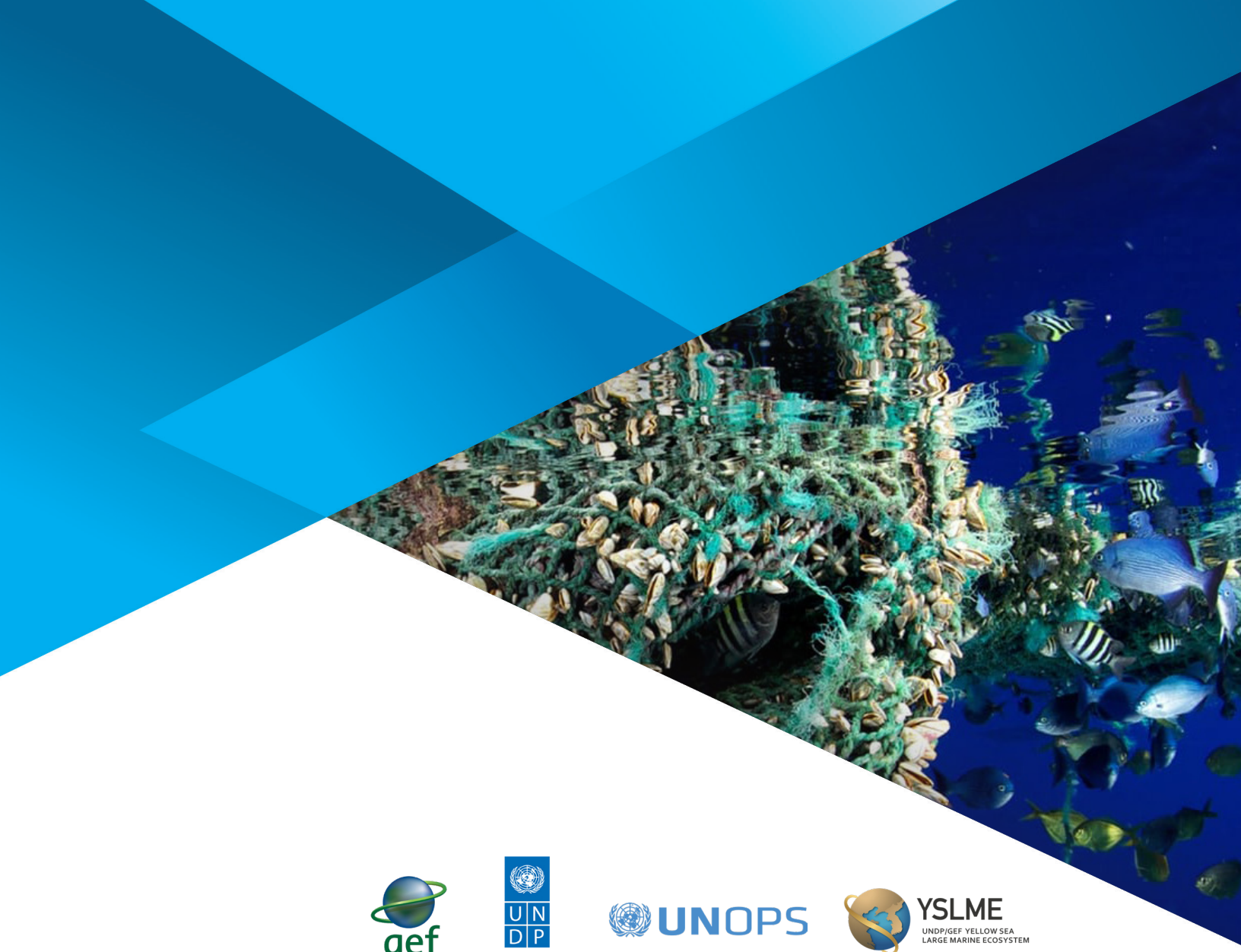

Implementing the Strategic Action Programme for the Yellow Sea Large Marine Ecosystem: Restoring Ecosystem Goods and Services and Consolidation of a Long-term Regional Environmental Governance Framework (UNDP/GEF YSLME Phase II Project)

Proceedings of the 1st Meeting of the Regional Working Group on Pollution Reduction (RWG-P) of the UNDP/GEF YSLME Phase II Project

Xinghai Golf Hotel, Dalian, PR China
10-12 October 2017

Cover photo shows plastic pieces in the ocean damages wildlife and it enters the food chain when ingested by fish.
(Photo by Bryce Groark/Alamy/theguardian)

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Table of Contents

Abbreviations

DEEP	–	Department of Ecological Environmental Protection (SOA)
GEF	–	The Global Environment Facility
HAB	–	Harmful Algal Blooms
ICC	–	Interim (YSLME) Commission Council
IOC/WESTPAC	–	IOC Sub-Commission for the Western Pacific
KOEM	–	Korea Marine Environment Management Corporation
LME	–	large marine ecosystem
MSTP	–	Management, Science and Technical Panel
M&E	–	Monitoring and Evaluation
MOF/ROK	–	Ministry of Oceans and Fisheries (RO Korea)
MPA	–	marine protected area
NCs	–	National Coordinators
NIFS	–	National Institute of Fisheries Science
NMEMC/SOA	–	National Marine Environmental Monitoring Center/State Oceanic Administration
NOWPAP	–	North West Pacific Action Plan
NSAP	–	National Strategic Action Programme
NWG	–	National Working Groups
PEMSEA	–	Partnerships for Environmental Management for the Seas of East Asia
PMO	–	Project Management Office
PRTR	–	Pollutant Release and Transfer Register
PRC	–	People's Republic of China
ROK	–	Republic of Korea
RWGs	–	Regional Working Groups
RWG-P	–	Regional Working Group on Pollution Reduction
SAP	–	Strategic Action Programme
SOA	–	State Oceanic Administration (PR China)
TDA	–	Transboundary Diagnostic Analysis
TOR	–	terms of reference
UNDAF	–	United Nations Development Assistance Framework
UNDP	–	United Nations Development Programme
UNOPS	–	United Nations Office of Project Services|
YS	–	Yellow Sea
YSLME	–	Yellow Sea Large Marine Ecosystem
YSMPAN	–	Yellow Sea Marine Protected Area Network
YSP	–	Yellow Sea Partnership

PROCEEDINGS OF THE MEETING

I. Opening of the meeting

1. The first meeting of the Regional Working Group on Pollution Reduction (RWG-P) of the UNDP/GEF YSLME Phase II Project was held in Xinghai Golf Hotel, Dalian, on October 10-12, 2017. The participants consisted of the National Coordinators (NCs) from PR China and RO Korea, members of the RWG-P from RO Korea and National Working Group on Pollution Reduction from PR China, representatives from National Marine Environmental Monitoring Center of State Oceanic Administration (NMEMC/SOA), Korea Marine Environment Management Corporation (KOEM) and staff of the Secretariat.

2. In his opening remarks, Mr. Yinfeng GUO, Chief Technical Adviser of the Project, welcomed all participants and thanked the NMEMC/SOA for their hospitality and the KOEM and NC of RO Korea for their facilitation of Regional Working Group (RWG) members to participate at the meeting. He also appreciated the RWG members of both countries for preparing the Terms of References (TORs) of regional activities which would be reviewed at the meeting. Mr. Guo introduced briefly the background of the YSLME Phase II Project, including the processes of the Transboundary Diagnostic Analysis (TDA) of the Yellow Sea (YS) and Strategic Action Programme (SAP). The SAP is aimed at addressing the identified major environmental concerns such as eutrophication, algae bloom and contaminants, among others, under the mandate of the RWG-P as directed by the first meeting of the Interim Commission Council (ICC). He also reminded the participants of the slower than expected implementation of the project and the urgency of its full implementation with cooperation of both countries.

3. Ms. Juying WANG, Deputy Director General of NMEMC/SOA and chair of RWG-P PR China, also remarked to welcome all participants. Ms. WANG placed much hope for the phase II project and wished it to be as successful as the first phase through enhanced cooperation. Through hosting the branch PMO at NMEMC, she expected that communication with national experts would be improved.

4. The participants went through a round of self-introduction, stating their names, organizations and expertise related to the mandate of the RWG-P.

5. The list of participants is attached to this report as Annex I.

2. Organization of the meeting

2.1. Election of Chair and designation of rapporteurs

6. Mr. GUO invited the representatives of PR China and RO Korea to nominate the Chair and Vice Chair of the meeting. Participants suggested Mr. GUO to serve as the interim Chair and designated the Secretariat as rapporteur. Mr. GUO accepted the suggestion of the meeting and emphasized that full ownership of the project is with PR China and RO Korea, urging the two countries to resolve the chairmanship of RWGs as early as possible.

7. Ms. WANG reiterated the importance of prompt implementation of activities that are delayed due to the late initiation of the project's second phase.

2.2 Adoption of agenda

8. The Chair explained that the meeting will address the following issues:
   1.) To seek consensus over the TORs and workplan of the RWG-P. The meeting is expected to tackle the revision and refinement of workplans if necessary;
   2.) To respond to the decisions of the ICC to expedite the implementation of the project with review of TORs of key activities related to the mandate of the RWG-P as a standard procedure of UNOPS and UNDP in mobilizing expertise to implement project activities;
   3) To identify demonstration sites and agree on interventions at local levels to catalyse active participation of local stakeholders in the future;
   4) To discuss on knowledge management and capacity development.

9. He also conveyed the concerns of UNDP and UNOPS regarding the slow progress of the project, which was ascribed to the late approval of the Annual Workplan. He expected the project to be implemented as planned through flexible arrangement of signing a memorandum of understanding with SOA and Project Cooperation Agreements (PCAs) with three institutes active in the two project phases. He also wished that the project and its progress would draw more attention from governmental sectors.

10. The meeting adopted the agenda as it is.

3. Review and refinement of documents approved at the 1st Meeting of Interim YSLME Commission Council

3.1 Project Overview and Outcomes; and activities related to the mandate of RWG-P

11. In his presentation, the Chair discussed the project outcomes, targets, activities, and budget in 2017. The outcomes of components 3 and 4 in relation to pollution reduction were elaborated. Among the activities mentioned were management measures set to be implemented by the RWG-P at regional level this year.

12. After the Chair's presentation, the floor was opened for comments and suggestions. Mr. Jae Ryoung OH, from RO Korea, mentioned concerns with regard to the project implementation in the country: 1) uncertainty of full support from the Ministry of Oceans and Fisheries (MOF) due to lack of budget in 2017; 2) need for more regional activities in close collaboration with experts from both countries; and 3) need to refer review of activities related to Harmful Algal Blooms (HAB) and jellyfish to RWG-A.

13. In response to the updates from RO Korea, the Chair said the PMO already knew about ROK's situation, adding that all activities listed in the National Strategic Action Programme (NSAP) would be implemented by member states financed by the government. As for regional activities that are not regularly funded by the national governments, both participating countries need to consider securing government budget beyond the GEF project cycle. This is to support the implementation of activities proved by RWGs as most effective if implemented at regional level. Considering the cross-cutting and interlinked characteristics of many activities among RWGs, views from experts of RWG-P can be shared with RWG-A if time allows for review at the meeting.

14. Upon the request of the Chair, the Secretariat introduced the TORs of RWGs, Chairs/Vice Chairs and RWG-P. After the presentation, the Chair opened the floor for discussion and invited participants to provide comments for possible revision, which could be submitted for further consideration at the next Management, Science and Technical Panel (MSTP).

15. RO Korea recalled an earlier intervention at the MSTP-1, emphasizing that it is the role of the Secretariat to organize regional workshops rather than the Chairs/Vice Chairs of the RWGs. The Chair requested the Secretariat to take note of the findings on TORs.

3.2 TORs of RWGs, Chairs/Vice Chairs, and RWG-P; and RWG-P work plan for 2017-2019

16. The Secretariat introduced the TORs of RWGs and Chairs/Vice Chairs with focus on TOR of RWG-P. After the presentation, the Chair emphasized that at the ICC-1, TOR of RWGs and 3-year work plans were approved under the condition of possible revision by RWG members.

17. Due to time constraints in the full implementation of project activities in 2017, representatives of both countries raised concerns on practicality. Ms. WANG suggested that activities that could not be completed by the end of the year be rescheduled to 2018.

18. After a lengthy discussion, the meeting suggested to review all activities and take note of the scheduled time to be completed.

19. Ms. WANG suggested to combine activities from different TORs based on similarity of nature. For example, in the TOR on marine litter review of policies and monitoring of marine litter under different disciplines are mixed together. She suggested to put these two activities into different TORs. Mr. OH also suggested to combine activities under several categories.

20. In response to the comments of Ms. WANG and Mr. OH, the Chair reminded the participants of the need to consider the two implementation modalities of project activities, i.e. implementation of project activities by NMEMC, FIO and YSFRI through entering into Project Cooperation Agreement, and outsourcing of services. He suggested to review TORs of activities one by one, and then to discuss the combination of activities.

21. The meeting agreed to combine activities under different subcontracts based upon specific circumstances and consideration of practical implementation modality of project activities.

4. Session 1: Implementation of Project Activities – Review of TORs for regional activities

22. The session reviewed a total of 15 TORs of project activities to be implemented in 2017, while the TORs related with HAB and jellyfish would be tabled for discussion in other RWGs. Activities and discussion results are highlighted in the following paragraphs:

Activity 1 of Output 3.1.1: Establish regional pollution monitoring guideline, environmental quality standards and network based on any existing ones: harmonize regional methodology; and, update regional monitoring guideline including for emerging contaminants

23. After the introduction of TORs by both countries, the Meeting highlighted two areas with different contributions from RO Korea and PR China: 1) deliverables to focus on a "proposal" for regional pollution monitoring guideline, suggested by PR China, and "pollution maps" of anthropogenic pollutants, suggested by RO Korea, which requires data-sharing between the two countries to facilitate the work of the international expert; and 2) expanding the scope of target pollutants from nutrients to "nutrients, Persistent Organic Pollutants (POPs) and heavy metals". According to the Secretariat, development of pollution maps is critical as it will provide good outcomes that will contribute to the updating of TDA and SAP.

24. Mr. OH introduced the concept of "non-target screening," which could be applicable to YS by considering the fact that no critical pollutants affecting marine environment have been identified.

25. In response to Mr. OH's suggestion, Ms. WANG suggested to identify critical pollutants causing serious problems in marine environment nowadays. Meanwhile, with regards to pollution maps, sharing data is unlikely to be a problem since relevant data and information is available in PR China although the format is different.

26. The Meeting agreed to include emerging pollutants, including POPs, heavy metals, QA/Q in developing guidelines and framework plan for establishing the monitoring network.

Activity 2 of Output 3.1.1: Support to apply modelling and calculate nutrient loading in hot spots/critical habitats: 2 pilot sites in China and 2 sites in RO Korea

27. After the presentation, the Meeting suggested to reduce the number of demonstration sites by taking into consideration the limitations in budget and time. In response to the suggestions made by both countries, the Chair informed the Meeting that reducing the number of demonstration sites without compromising the results of the project could be considered as an option, which has already been discussed within UNOPS.

28. Ms. WANG proposed to consider Haizou Bay in Lianyungang City, Jiangsu Province, as a demonstration site.

29. RO Korea suggested the use of watershed approach in applying modelling and calculating nutrient loading. Although this strategy is welcomed to reflect the ecosystem-based approach, the Meeting was reminded of the fact that there are no suitable watersheds in the Yellow Sea region where modelling can be applied. The Yellow River is outside the project's geographical coverage while the Yangtze River is too large to be included.

30. After a lengthy discussion, the Meeting agreed to reduce demonstration sites from two to one per country and consider the use of "watershed approach" in the scope of study. It was also suggested to add new initiatives to be conducted by the NMEMC.

Activity 1 of Output 3.1.2: Diagnostic analysis of ID sources and sinks of pollutants, review available data and information, report environmental status and trends of YS, and identify gaps and explore mechanisms for data and information sharing between the two countries

31. After the presentation, Ms. WANG asked to clarify "trends" that could be implied "temporal" or "spatial" approach. Since the pollution maps are available, "spatial" trends can be made. Understanding of "temporal" trends will be meaningful since the trends during the 1st phase could be compared with the one in the 2nd phase. She also suggested not to consider quality standards because regional standard has not been set up for the assessment of the YS.

32. After a lengthy discussion, the Meeting agreed on the importance of diagnostic analysis of sources and sinks of pollutants. With the suggestions made by both countries, the PMO is requested to consolidate the two TORs into one.

Activity 2 of Output 3.1.2: Support for monitoring and data acquisition for sharing on pollutants from atmosphere-based sources

33. After the presentations from both countries, Mr. OH highlighted different target compounds – nutrients by PR China and PBT, including heavy metals, by RO Korea. He also suggested that the PMO revise the title of the subcontract, followed by an introduction of concept of Pollutant Release and Transfer Register (PRTR) used by Organisation for Economic Co-operation and Development (OECD) for consideration and use by two countries.

34. PR China expressed a concern on data sharing and value of PRTR as in PR China PRTR is not officially established till now by the Ministry of Environmental Protection (MEP).

35. After a lengthy discussion, the Meeting agreed to include nutrients with hazardous substances (heavy metals and POPs). With the suggestions made by both countries, the PMO will consolidate two TORs into one.

Activity 3 of Output 3.1.2.: Support for monitoring and data acquisition for sharing on fertilizer use

36. After the presentation of a representative from NMEMC/SOA of PR China, Mr. BonKyung KOO of RO Korea suggested to combine Activity 3 with Activity 1 due to similar characteristics.

37. As for geographical coverage of the project in PR China, the Chair mentioned three provinces; namely, Liaoning, Shandong and Jiangsu. Meanwhile, fertilizer use data from five provinces in RO Korea will also be made available for future use.

Activity 4 of Output 3.1.2.: Support for monitoring and data acquisition for sharing from sea-based sources

38. NMEME/SOA presented the TOR of the activity for comments. Mr. OH introduced briefly ship-based pollutants to help understand the scope of the given TOR.

39. The Chair supported to include other sea-based pollutants in addition to those from mariculture, which was agreed by PR China, and concluded to set the scope of the study at "sea-based" pollutants. The Chair also accepted the suggestion to delete the term "in PR China" in the title of the study.

Activity 1 of Output 3.2.1: Develop regional strategy for using wetlands as nutrient sink

40. The Meeting agreed on the importance of reviewing the status of coastal wetlands in nutrient removals.

41. Mr. Seung HEO from RO Korea suggested to combine this project with activity 2 of output 3.2.1., which will synthesize the good practices using wetlands as nutrient sinks. On activity 2 of output 3.2.1, Mr. OH suggested to use good practices of the Yellow Sea instead of experiences of other regions. This is to ease communication and cross-site learning.

42. The Meeting agreed to combine the two activities and to add more case studies in sites located in YS region.

43. The Meeting adjourned at 18:00, followed by a dinner reception hosted by the Project.

44. The Meeting on the second day started at 9:00. The agenda was to continue reviewing the remaining TORs.

Activity 1 of Output 3.3.1: Review of policies and regulations in PR China and RO Korea on dealing with pollution control and assess compliance with United Nations Convention on the Law of the Sea (UNCLOS), the future we want, multi-lateral environmental agreements and programmes ratified by both countries, and prioritize legal and regulatory reforms in both countries

45. After the presentation, Mr. OH suggested to cover in the study both PR China and RO Korea. Ms. WANG and Ms. Sunyoung CHAE from RO Korea had the same opinion on cooperation between both countries. They said the project is for both PR China and RO Korea; thus, every activity should be participated by both governments as a regional activity.

46. Ms. WANG suggested that this TOR should include both RO Korea and PR China. Ms. CHAE, on the other hand, emphasised the need to review TOR of regional activities by RWG-Governance before hiring of consultants. Mr. OH proposed that the activity 1 of output 3.1.1 be revised as well.

47. Taking into consideration both countries' request to expand the use of the GEF grant to review legal frameworks of both PR China and RO Korea, the Chair concluded to accept the proposed revisions to the TOR. The TOR will include both countries in the review with the understanding that while activities in the project will be implemented by both countries, the GEF grant will support activities in PR China in accordance to the Project Document and GEF policy. Moreover, with the enlarged scope of study, the Chair suggested to reduce the scope of Output 3 only by the International Consultant, with the Outputs 1 and 2 to be primarily provided by the two countries with assistance from the intern on environmental law. He further suggested to revisit the reporting dates by the PMO.

Activity 2 of Output 3.3.1: Review of international and regional instruments and policies on waste management, guidelines on marine litter monitoring and assessment, and develop a harmonized regional microplastics monitoring and assessment guidelines

Activity 4 of Output 3.3.1: Support to develop regulatory measures for marine litter monitoring, disposal, handling, reuse, recycle in pilot province or city of Yellow Sea to enable investment on recycling economies

Activity 1 of Output 3.4.1: Regional review of existing policies and regulations regarding solid waste disposal as well as technologies for reducing production including recycling opportunities

Activity 2 of Output 3.4.1: Develop & test monitoring system, and conduct a regional baseline survey of marine litter in collaboration with other relevant organizations

48. Ms. Weiwei ZHANG from PR China presented four TORs in relation to marine litter.

49. Mr. OH from RO Korea pointed out that the TOR for Activity 4 of Output 3.3.1 prepared by RO Korea expert considered only marine litter monitoring without touching on support to local government in developing enabling policies. According to him, marine litter and micro-plastic should be handled separately. In addition, he said that development of the guidelines and regulatory measures on marine litter and micro-plastic should also be included in different TORs. Given the institutional and technical capacity of NMEMC/SOA, he suggested that all activities related with marine litter be undertaken by the NMEMC/SOA.

50. The Meeting discussed the need to undertake studies on impact of microplastics to seafood, and the need to develop regional microplastics guidelines by the Project.

51. Following open discussions, the Meeting concluded that because there are no existing international guidelines for micro-plastic monitoring, there is no point of developing microplastics monitoring guidelines by the YSLME Phase II Project. Currently, international guidelines are being developed with participation of experts world-wide. Full involvement of experts from PR China and RO Korea is strongly recommended in the development process of such international guidelines. The Meeting recognized that in spite of the need for better understanding of the impact of microplastics on seafood, technically the cause-effect relationship between microplastics and seafood security is not scientifically established, let alone the accumulated effects of microplastics and chemical compounds on seafood.

52. Following the discussion, the Chair concluded that in Activity 2 of Output 3.3.1, the review of international and regional instruments and policies on waste management and guidelines on marine litter monitoring and assessment will be combined with Activity 1 of Output 3.1.1. The budget for developing a harmonized regional microplastics monitoring and assessment guidelines then would be set aside for other uses under the Project Cooperation Agreement (PCA) with NMEMC.

53. For Activity 2 of Output 3.4.1, the Chair concluded to include in the PCA with NMEMC instead of mobilizing an international consultant as originally planned.

Activity 3 of Output 3.1.1: Review of control mechanisms from point sources; evaluate facilities and equipment to control/reduce discharge from industrial and municipal sources; and, control/mitigation mechanism of pollution from point sources

54. Ms. WANG pointed out that marine litter should not be included in this activity. Mr. OH also suggested to delete or modify the bullet point one of the activity. He suggested that after this modification, the TORs for demonstration sites may also need to be modified.

55. The Chair concluded to revise the TOR by the PMO for further review by the RWG-P through communication.

Activity 4 of Output 3.1.1: Economics analysis of reduction of nutrients for better environment and ecosystem of pilot sites

56. Mr. OH suggested to revise the title of the consultancy to keep consistency among purposes of the activity. In addition, Mr. KOO questioned the benefits of developing artificial wetland for nutrient treatments and other environmental benefits. He claims that artificial wetland should not be prioritized for such interventions do not target the root causes. According to him, the first task to be done should be categorizing the pollutant sources and finding out contributions to the Yellow Sea.

57. With the understanding of the comments made by Mr. KOO, Ms. WANG believed that more wetland, including artificial ones, will be built with support of national governments in the future. In this regard, support to demonstration of using wetland as nutrient sinks is very relevant to the subject area.

58. Acknowledging Mr. KOO's comments, the Chair recalled the TDA and SAP processes when the RWGs of the two countries identified the issues and root causes and strategized actions in the YSLME SAP signed by the two countries. As means to support the implementation of the YSLME SAP, the development of regional strategy and demonstration of using wetland regulating services to sink nutrients are designed along with endorsement of the MSTP-1. Given the rigorousness of the TDA and SAP processes, he believes the inclusion of wetland construction and restoration activities in the project is necessary.

Activity 3 of Output 3.2.1: Technical support to design wetland habitats to achieve blue bay in three pilot sites in China and application of clean production technologies and relevant technology transfer.

59. During the discussion between Mr. ZHU and Mr. KOO on the effectiveness of artificial wetland, Mr. KOO suggested to consider using part of the budget for demonstration of wetland construction and restoration to activity 3, data collection and sharing of fertilizer use, of output 3.1.2.

60. In selecting demonstration sites for wetland construction or restoration, the Chair said the project can consider the demonstration of good production practices in reduction of fertilizer use and construction of wetland under the watershed management framework.

Activity 3 of Output 3.3.1: Review technologies for waste reduction, reuse, recovery, and economic studies on recycling uses

61. Mr. KOO, however, questioned the need of this activity, a view shared by Ms. CHAE. After hearing this concern, the Chair concluded to postpone this activity for future review, with a potential option of using the budget for some other activities.

62. After reviewing all TORs, Mr. LIANG elaborated the need for selection of demonstration sites in mitigation of sewage, construction of wetland and other purposes based on the equal participation of the three provinces in China. The Chair reviewed the existing demonstration sites with a finding that all provinces are represented and agreed to make balance in finalizing final demonstration sites.

5. Session 2: Integration of monitoring and assessment methodologies and development of regional environment pollution monitoring guidelines

63. In this session, representatives from the two countries were invited to present available data/information on sources, pathways and distributions of pollutants, as well as environmental pollution monitoring and assessment methodologies and network.

64. On behalf of PR China, Mr. Ziwei YAO delivered the presentation on the monitoring and assessment methodologies. He gave an introduction of history of marine environment monitoring and marine environmental monitoring agencies and areas in PR China. His talk focused on the following issues:
    - Strategic plan on online and real-time monitoring stations in China
    - Improvement of marine environment assessment methods
    - Marine environment monitoring and assessment services
    - Establishment of an open and cooperative working mechanism

65. Mr. Jae Ryoung OH, NC of RO Korea, delivered the presentation on Marine Environment Monitoring Systems in the country: marine environment monitoring sampling stations; monitoring results; data services (marine environment information system, website www.meis.go.kr), and the annual and semi-annual reports.

66. Being asked about who is responsible for the analysis, Mr. OH said the KOEM and Hanyang University are responsible.

67. Both sides agreed to share the presentations with each other for better understanding of the monitoring of marine environments of each country.

68. Mr. OH raised the question on how to develop the regional guidelines of the two countries, and suggested each country should provide detailed information.

69. Mr. OH informed that except certain monitoring data, RO Korea is pleased to make available its monitoring data. He cited the difficult situation of accessing data from website and the slow progress and responses in getting in touch with SOA. He then suggested experts from each country visit laboratories of each other. Mr. LIANG echoed in saying that Chinese experts could visit RO Korea and Korean experts could visit China to help better understand the methodologies of each nation.

70. In response to the interventions of Mr. OH and Mr. LIANG, the Chair commented that mutual visits could be a good idea to consider. In this case, the Chair mentioned several options for the two countries to make progress in developing and harmonizing regional monitoring guidelines. This include:
    - Hiring of international consultant;
    - Mutual visits of experts from each country; and
    - Use of national experts from each country.

71. The Chair suggested the two countries to review the three options and inform the Secretariat of the final decisions as mutual visits might need to get endorsement from national authorities. The Chair acknowledged PR China's agreement for the project to support the consultancy of Korean experts and even travels.

6. Session 3: Planning of workshop on guidelines and protocols to monitor SAP implementation and update

72. This session was designed to discuss the scheduling of a workshop, including topics venue, dates, and expected outcomes, among others.

73. Mr. OH from RO Korea suggested four subjects:
    - Marine litter, including microplastics
    - POPs, heavy metal and emerging contaminants
    - Nutrients
    - General laws and policies

74. After some discussions, themes of potential workshops have been narrowed down to two: 1) Marine litter, including microplastics and 2) Nutrients. For each workshop, impacts of pollutants, monitoring, policies and legislation, and reduction technologies could be set as major topics for further development based on needs and partnerships. For both themes, Northwest Pacific Action Plan (NOWPAP) is identified as a partner for collaboration.

75. The Chair concluded that next year's RWG-P meeting will be held at RO Korea back-to-back with a workshop under the theme of nutrient management in the third quarter of 2018. To fully capitalize the inputs of the workshop, the RWG-P could be held after the workshop. The workshop on marine litter will be held in 2019 in PR China.

7. Session 4: Review of Selection Criteria and agreement of initial list of demonstration sites

76. The Meeting discussed that PR China will choose one site between Haizhou Bay and Dalian Bay for demonstration for sewage and nutrient reduction in pollution hot spots and Rushan and possibly Rudong as well as demonstration for wetland construction or restoration. PR China agreed to inform the Secretariat of its final decision shortly after consultation with members of the Inter-Ministerial Coordinating Committee (IMCC) in respective provinces. PR China also confirmed to select Weihai as a site for policy development to reduce marine litter.

77. RO Korea suggested that Kanghwa Island be an MPA site and wetland restoration demonstration. It was also suggested that Han River be one option for demonstration of watershed approach in nutrient reduction. Ro Korea mentioned that the site for marine litter reduction cannot be decided at this moment because the expert in this field was not in the Meeting. The expert, however, agreed to notify the Secretariat within a week.

8. Session 5: Knowledge Management and Capacity Development

78. Mr. OH suggested the case studies of algae blooms and jellyfish in YSLME be referred to RWG on monitoring and assessment. This suggestion was accepted by the Chair. He also said that both countries could share ideas on capacity development based on needs and design of monitoring program on capacity building.

79. Ms. WANG expressed NMEMC's interest in sharing information on monitoring frequency and parameters, among others. She said PR China would support the development of training modules and programs.

80. Mr. OH shared his experiences on capacity development in LMEs in the past years and expressed the willingness to assist in this area. He also emphasized the need to review data before releasing to public domain. On this matter, the Chair agreed that data generated from YSLME project should be released to the public after review and clearance by respective RWGs. He also suggested to take knowledge management and capacity development separately as both tackle different subjects. The Chair also suggested to create posts to facilitate the knowledge management and capacity development in particular preparation of training modules subject to availability of budget. He added that PMO would prepare TOR(s) for such posts.

9. Session 6: Collaboration with other partners

81. The Chair recalled that the first phase of the project developed the Yellow Sea Partnership, while the guidelines for strengthening the joint effort was approved by the ICC-1. He underscored the importance of the implementation of the YSLME SAP by broader partners. In this regard, he called on the RWG members to give \advice for this item in the agenda.

82. Ms. WANG shared information about the meeting with NOWPAP, which is set next month in Qingdao, China. The topic will be on eutrophication assessment technology. She also invited the PMO to join the workshop on microplastic next month in Shanghai as a joint initiative of PR China and Japan. Last month, she attended a meeting held in Phuket under IOC/WESTPAC. At the workshop, three working groups addressed different issues that are relevant to the agenda of RWG-P. From this, she believes that useful methodologies should be developed and adapted at international level. She also highlighted the importance of cooperation with other organizations.

83. The Chair appreciated the updates by Ms. WANG and said that the Secretariat should make efforts to make such updates available to all members. He asked the PMO to put events related with RWGs' mandate on the website.

10. Agenda for the next RWG meeting

84. The Chair was pleased to note that both countries agreed that the next RWG meeting would be held in Busan, RO Korea in the third quarter of next year. This will be held back-to-back with the proposed workshop on nutrients. He said the PMO will draft the meeting program and share it with RWG-P members for further consultations with the two chairs of NWG-P.

85. During the discussion, Mr. LIANG suggested to hold the workshop on nutrient before the RWG meeting.

11. Other matters

86. On data management, Mr. OH suggested that PMO should check the status of database from phase one hosted by China-Korea Joint Ocean Research Center (CKJORC). Ms. WANG commented that the platform from phase one would be good to use during phase two.

12. Wrap-up and closure of the meeting

87. The Chair highlighted the productivity of the Meeting, saying this would enable the PMO to proceed with the implementation of activities. The Chair said the TORs would be consolidated, combined and revised as discussed for sharing with RWG members within a week. He also requested feedback from RWG members within a week.

88. Mr. OH thanked the participants for being open-minded and cooperative in reviewing the TORs during the entire course of the Meeting. On behalf of the delegation, he expressed gratefulness for the hospitality of NMEMC and the friendship established with Ms. WANG. He also showed appreciation to the Chair and the PMO, saying she believes the next meeting will produce even better results in the future.

89. Ms. WANG said that she was worried in the beginning because of the large number of TORs to review. However, fortunately the participants were able to go through all of them. She said she believes this Meeting was successful, adding that the communication with both sides went really well. She is positive that there will be more productive results in the future and that she looks forward to the continued constructive contributions from both sides. She thanked the PMO for the hospitality and successful delivery of the Meeting.

90. Mr. LIANG said that this was his first time participating in a RWG meeting in Phase II and was satisfied with the results. He said openness and friendliness were keys to making the Meeting smooth, which he hopes to continue in the future.

91. The Chair thanked all the participants and officially closed the Meeting. He then invited participants to a lunch hosted by the PMO.

Annex 1. List of Participants

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Annex 2: Program of the 1st Meeting of the RWG-P

Program of the First Meeting of Regional Working Group on Pollution Reduction
Dalian, PR China, 10-12 October 2017

Background
Terms of Reference, Workplan of the Regional Working Group on Pollution for 2017-2019 and the Project Workplan for 2017 have been approved by the first meeting of the Interim Commission Council(ICC-1) last July in 2017. Based on decisions of the Interim Commission Council, implementation of activities of these workplans need to consider the following factors:

- Significant delay of the second phase of the Project and delayed establishment of the RWGs and the urgency of implementation of activities immediately;
- Review of planned activities carefully by RWG members who have not participated in the first meeting of the MSTP; and
- Maximizing cooperation and coordination among experts of RWGs from participating countries.

In line with the decisions of the ICC-1, the 1st meeting of the RWG-P will be held in Dalian of PR China on October 10-12, 2017. The meeting will be organized by the Interim Commission Secretariat in collaboration with National Marine Environmental Monitoring Centre of the State Oceanic Administration (NMEMC).

Objectives and Outcomes of the meeting
The 1st meeting of the RWG-P aims to achieve the following objectives:

- To review and refine the TOR of RWG-P and workplan for 2017-2019 as necessary and agreement on the work arrangement among RWG members;
- To review and build consensus on the TORs of and/or methodologies to conduct regional activities under purview of the RWG-P to enable expedited implementation of project activities in 2017;
- To discuss and agree on the draft program of a regional workshop on monitoring and assessment methodologies and harmonization of regional monitoring guidelines.
- To identify areas of collaboration and partners and potential collaborative activities for support by the Project

It is expected that the workshop could provide the following tangible outcomes:

1) Revised TOR and workplan activities proposed in the 3-year workplan and agreed work arrangement among RWG-P members;
2) Revised program of regional workshop, agreed on monitoring technology, assessment methodology and regional monitoring guideline;
3) Consensus on TORs of and methodologies to conduct project regional activities;
4) demonstration sites identified in PR China and RO Korea for wetland restoration and pollution reduction in hotspots;
5) 1-3 collaborative events proposed for support by the Project;
6) Agenda of next RWG meeting; and
7) Consensus on knowledge products and training modules.

Participants

- Members of the RWG designated by China and RO Korea, NMEMC, China, KIOST, RO Korea, CTA /Manger, Environment Officer, Environmental Economist, etc.

PROGRAM

10 October (Tuesday)	
08:00~09:30	Registration for participants
09:30~09:50	**Opening of the meeting** • Welcome addresses • Introduction of the members and participants
09:50~10:00	**Organization of the meeting** • Election of Chairs and designation of rapporteurs • Adoption of agenda
10:00~11:00	**Review and refine the following documents approved by the Interim YSLME Commission:** • Project Workplan in 2017 and activities related to the mandate of RWG-P; • Terms of Reference of RWGs and Chairs/Vice Chairs; • TOR of RWG-P; • RWG-P workplan (2017-2019)
11:00~11:15	Coffee break and group photo
11:15~12:00	**Review workplan for 2017 and activities, and work arrangement among RWG-P members**
12:00~14:00	Lunch and Break
14:00~16:30	**Session 1: Initiating implementation of Project Activities - Review of TORs for regional activities (meeting documents or TORs will be prepared by PMO and members of RWGs)** • Activity 1 of Output 3.1.1: Establish regional pollution monitoring guideline, environmental quality standards and network based on any existing ones: harmonize regional methodology and update regional monitoring guideline including for emerging contaminants • Activity 2 of Output 3.1.1: Support to apply modelling & calculate nutrient loading in hot spots/ critical habitats: 2 pilot sites in China and 2 sites in RO Korea • Activity 1 of Output 3.1.2: Diagnostic analysis of ID sources & sinks of pollutants, review available data & info, report environmental status and trends of YS, and identify gaps and explore mechanisms for data and information sharing between the two countries • Activity 2 of Output 3.1.2: Support for monitoring and data acquisition for sharing on pollutants from atmosphere-based sources • Activity 3 of Output 3.1.2: Support for monitoring and data acquisition for sharing on fertilizer use • Activity 4 of Output 3.1.2: Support for monitoring and data acquisition for sharing from sea-based sources • Activity 1 of Output 3.2.1: develop regional strategy for using wetlands as nutrient sink
16:30~16:45	Coffee Break

10 October (Tuesday) (cont.)	
16:45~18:00	**Continuation of Session 1:** • Activity 1 of Output 3.3.1: Review of policies and regulations in China and RO Korea dealing with pollution control and assess compliance with UNCLOs, the future We Want, multi-lateral environmental agreements and programmes ratified by both countries, and prioritize legal and regulatory reforms in both countries • Activity 2 of Output 3.3.1: Review of international and regional instruments and policies on waste management, guidelines on marine litter monitoring and assessment, and develop a harmonized regional microplastics monitoring and assessment guidelines • Activity 4 of Output 3.3.1: support to develop regulatory measures for marine litter monitoring • Activity 1 of Output 3.4.1: Regional review of existing policies and regulations regarding solid waste disposal as well as technologies for reducing production including recycling opportunities
11 October (Wednesday)	
09:30~10:30	**Session 1: Initiating implementation of Project Activities - Review of TORs for regional activities (continuation)** • Activity 2 of Output 3.4.1: Develop & test monitoring system, and conduct a regional baseline survey of marine litter in collaboration with other relevant organizations • Activity 4 of Output 4.4.2: create regional jellyfish monitoring program: create regional committee to coordinate monitoring, assessment and data sharing and develop national and regional monitoring methodologies of jellyfish booms. • Activity 5 of Output 4.4.2: create regional HAB (including macro-algae) monitoring program: create regional committee to coordinate monitoring, assessment and data sharing. Combine with jellyfish committee to develop national and regional monitoring methodologies of HAB • Activity 3 of output 3.1.1: Review of control mechanisms from point sources and evaluate facilities and equipment to control/reduce discharge from industrial and municipal sources and control/mitigation mechanism of pollution from point sources • Activity 4 of output 3.1.1: Economics analysis of reduction of nutrients for better environment and ecosystem of pilot sites
10:30~10:45	Coffee break
10:45~12:00	**Session 1: continuation** • Activity 2 of Output 3.2.1: cost-effective and sustainable mechanism to treat municipal wastewater & sewage: good practices and experience sharing and learning • Activity 3 of Output 3.2.1: technical support to design wetland habitats to achieve blue bay in three pilot sites in China and application of clean production technologies and relevant technology transfer • Activity 3 of Output 3.3.1: review technologies for waste reduction, reuse, recovery, and economic studies on recycling uses
12:00~14:00	Lunch

11 October (Wednesday) (cont.)	
14:00~17:00	**Session 2: Harmonizing monitoring and assessment methodologies and development of regional environment pollution monitoring guidelines** • Country presentations on available data/information on sources, pathways, and distribution of pollutants, as well as environmental pollution monitoring and assessment methodologies and network - PR China and RO Korea The presentations will be followed with In-depth discussions on determination of "hot spots"; monitoring procedures; and information and data gaps and agreed solutions of data acquisition required actions and workplan which need data support and required actions for TDA preparation.
12 October (Thursday)	
09:00~10:00	**Session 3: Planning for a workshop on need and development of a harmonized monitoring guidelines and protocols to monitoring SAP implementation and update SAP** (It is expected that the workshop will agree on the venue, dates, outcomes of the workshop, sessions and outputs, chair and co-chair of each session, speakers from RO Korea and PR China and other organizations under each session, and facilitators of break-out group discussions if needed, and field visit program)
10:00~10:15	Coffee break
10:15~11:00	**Session 4: Review the criteria of selection demonstration sites and agree on the initial list of demonstration sites** • Yalu river estuary and Xiaoyangkou, RuDong City, Jiangsu Province, on wetland restoration for pollutant reduction • Linshui Bay, Dalian, Liaoning province and Rushan Bay, Shandong, for demonstration of pollution reduction Demonstration sites from RO Korea will also be introduced in line with the principle that each country will have equal number of demonstration sites for exchange of experiences and cross-site learning. In this session, RWG members will discuss selection criteria, and methodologies, and review local contexts and GEF support to demonstration sites. representatives from local governments of China and RO Korea can also be invited to participate to present the proposals for support by the project.
11:00~12:00	**Session 5: Knowledge Management and capacity development** PMO will introduce the knowledge management of the project in relation to the mandate of the RWG-P. Needs and key elements of training modules and modalities for disseminating project results will also be discussed. • ecosystem carrying capacity: contaminants from river-sea interaction and atmospheric deposition; • design, plan and implement an integrated ecosystem-based monitoring system of LME; • ecosystem carrying capacity: case study of algae blooms in YSLME; • ecosystem carrying capacity: case study of Jellyfish outbreak in YSLME.
12:00~14:00	Lunch and Break

12 October (Thursday) (cont.)	
14:00~15:30	**Session 6: Collaboration with other partners** In this session, the RWG members will be invited to give suggestions on collaboration with other regional ocean governance mechanisms, including NOWPAP, NEAR-GOOS, etc. Co-operation with other project components and relevant activities in the region will also be reviewed. Based on review, 1-3 collaborative events will be proposed for support by the Project.
15:30~15:45	Coffee break
15:45~16:00	**Agenda of next RWG meeting**
16:00~16:20	**Other business**
16:20~16:40	**Wrap-up and closure of the meeting**

Annex 3: Terms of Reference of activities in Component 3 and Component 4 in relation to mandate of RWG-P in UNDP/GEF YSLME Phase II Project

These terms of reference, jointly prepared by Members of NWGs of PR China and RO Korea and the Secretariat, were revised taking into consideration of the comments from the 1st Meeting of the RWG-P.

Activity 1 of Output 3.1.1 (REV)

Establish regional pollution monitoring guideline, environmental quality standards and network based on any existing ones: harmonize regional methodology and update regional monitoring guideline including for emerging contaminants

TERMS OF REFERENCE

Marine Environmental Monitoring Specialist

Consultancy classification:	International
Budget line:	71200, Activity 1 of Output 3.1.1, Component 3. Budget: USD 16,000;
Estimated start of work:	March 1, 2018
Duty station:	Home-based

Background and Justification

The Yellow Sea (YS) is located between the Chinese mainland and the Korean Peninsula, and is surrounded by coastal areas with massive urbanization and industrialization. The coastal zones are surrounded by several metropolitans such as Chinese cities of Dalian and Qingdao, and Korean cities of Seoul, Incheon, Ansan, and Gunsan. Intensive anthropogenic activities in these regions have contaminated environmental quality, along the coast. Rivers from PF China and RO Korea, such as Chinese rivers of Liaohe, Haihe and Yellow, and Korean rivers of Han, Geum and Youngsan also run into the YS, and a large amount of municipal and industrial pollutants are discharged to the YS. Various pollutants tend to be accumulated in the YS because of exchange of water between the Bohai and the YS. The YS can be acted as a sink and a long-term source. The YS is also one of the most important fishery stocks, and provides large amounts of seafood to Chinese and Korean cities. It is necessary to reduce and manage anthropogenic pollutants from lands and/or sea for sustainability of fisheries resource and safety of seafood. Overall pollution status and risk assessment of anthropogenic pollutants including legacy/new persistent organic pollutants (POPs) and metals should be investigated in the YS. The large geographical coverage in the coastal lines of the YS as well as the YS enables to gain insights into the anthropogenic impacts, the transport pathways, and the environmental fate of anthropogenic pollutants in the YS. It will be necessary to harmonize monitoring guidelines and analytical methods for data set with quality assurance and quality control (QA/QC).

Objectives

The objective underlying the proposed consultancy is to develop a proposal of regional pollution monitoring network and develop maps of anthropogenic pollutants, e.g. POPs and heavy metals and others in the YS as agreed by participating countries. To do this, it is necessary to harmonize monitoring methodology and update monitoring guidelines.

Expected Outputs

The consultant is expected to deliver the following results:

- A proposal for guideline on regional pollution monitoring of target pollutants
- A draft framework plan for establishing the monitoring network in the Yellow Sea
- Pollution maps of anthropogenic pollutants in environmental media along the YS

Activities

The consultant, under supervision of the Chief Technical Advisor and technical guidance of RWG-P in close collaboration with the national project team, will conduct the following activities under the three outputs:

Output 1: A proposal for guidelines on regional pollution monitoring of target pollutants including legacy/new POPs, metals, and/or emerging contaminants in the YS

- Summarize and review the existing pollution monitoring guidelines, the environmental quality standards and regulations on marine environments of PR China and RO Korea;
- Through exchange visits of laboratories by experts of PR China and RO Korea, compare the similarities and differences of existing pollution monitoring guidelines, the environmental quality standards on marine environments between PR China and RO Korea;
- Analyze their differences in guidelines and standards and identify and develop a practice note to enable clear and easy interpretation of data and information generated from the application of the respective guidelines and standards;
- Prepare the draft proposal for guidelines on regional pollution monitoring of target pollutants, and submit it for consultation and review by members of the RWG-P of the YSLME Phase II Project.
- Incorporate comments and submit a final draft proposal in hard copy and electronically.

Output 2: A draft framework plan for establishing the monitoring network in the Yellow Sea

- Review marine pollution monitoring network of PR China and RO Korea.
- Through exchange of visits facilitated by PMO, compare the similarities and differences of the marine pollution monitoring networks between China and RO Korea, and analyze the potential extent possible in YSLME.
- Assess the monitoring networks efficiency to focus on the major environmental problem (enrichment of nutrients) in the Yellow sea.
- Review the existing national marine pollution monitoring programs of PR China and RO Korea, the existing monitoring guidelines and methodology, and the environmental quality standards;
- Taking into account of social and economic context, administration needs and technical levels as well as the above assessment outcomes, propose a draft framework plan for establishing the monitoring network in the Yellow Sea at regional level for improved the effectiveness.
- Present the draft framework plan of network at the workshop conducted by the PMO, and facilitate a discussion on the draft framework.
- Based on the comments from the different sides, revise and submit the final draft framework plan to REG-P and PMO.

Output 3: pollution map of anthropogenic pollutants in environmental media along the YS

- Review existing data and information on anthropogenic pollutants including legacy/new POPs, metals, and/or emerging contaminants in the YS, propose target compounds for monitoring guidelines and methodology and propose hotspot areas
- Review QA/QC programs for reliable and compatible data set, propose inter-calibration exercise of participating laboratories.
- Organize and conduct working parties and training within area of competency
- Produce pollution maps of anthropogenic pollutants including nutrients, POPs and heavy metals in environmental media along the YS. Specific contaminants are subject to agreement by the PR China and RO Korea;

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will provide the background information and documents.

Timing

The consultancy will begin in March 2018 and complete in December 1, 2018. The contract will be extended upon approval of project extension in June, 2018.

Competencies

- A good understanding of marine environmental monitoring of POPs and emerging contaminants;
- Advanced university education at MSc or Ph.D. level with expertise in the area of environmental science, marine sciences or marine chemistry;
- At least 5 years of professional experience in coastal and marine environment monitoring;
- Strong skills in data analysis and mapping;
- Experiences in international cooperation in environmental projects, in particular with RO Korea;
- Very good knowledge of marine environmental monitoring protocols and programs;
- Fluent speaking, reading and writing skills in English

Payment and submission

The consultant will be paid for a lump of USD 16,000 for the consultancy. Deliverables and payment schedules are as follows:

- By June 20, 2018, draft proposal of regional pollution monitoring of target pollutants; (20%);
- By August 30, 2018, draft framework plan of the monitoring network; (30%)
- By December 1, 2018, pollution maps of anthropogenic pollutants including nutrients, POPs and heavy metals in environmental media along the YS; (50%)

The consultant can submit reports electronically to Mr. Yinfeng GUO, CTA/Manager at email: yinfengg@unops.org. to the PMO. All reports should be submitted in English.

Activity 2 of Output 3.1.1 (REV)

Support to apply modelling & calculate nutrient loading in hot spots/ critical habitats (1 pilot site in PR China and 1 site in RO Korea)

TERMS OF REFERENCE

Support to apply modelling and estimation of land based nutrients loading in hot spots

Consultancy classification: subcontract
Budget line: 72100, Activity 2 of Output 3.1.1, Component 3
Estimated start of work: Mid-October 2017 – June 30, 2018

Background and Justification

Based on the transboundary diagnostic analysis of the Yellow Sea, one of the major environmental problems is the enrichment of nutrients in the Yellow Sea which is the major cause of harmful algal blooms in the region. Water pollution in coastal areas has caused social and political attention because of its significant impacts on not only the environment, but also the economy and society as well. More importantly, water pollution issue has been intertwined with eutrophication caused by the nutrients pollution from land based pollutant sources, atmospheric deposition and aquaculture, etc. Usually, land based nutrients discharge is recognized as one of the main pollutant sources to the marine environment, especially from the river inputs. Therefore, estimation of the nutrients loading from the river inputs is thought to be the major tools to identifying the pollutant sources and understanding nutrient pollution levels in the hot spots and critical habitats in the YSLME region.

In order to help local governments seek for the solution of the reduction the nutrient pollutant to the sea, and with spin-off effect of ecological services for public benefits, the project will conduct an evaluation the total nutrients load from land based sources and good practices for the nutrients reduction that can be applied across YSLME in particular.

Objectives

The objective underlying the proposed consultancy is to apply a watershed model and estimation of land based nutrients loading in hot spots, respectively in PR China and RO Korea.

Immediate Objectives

The objectives underlying the proposed consultancy are:

- To support a watershed model for the nutrients loading estimation in the hot spots, respectively in PR China and in RO Korea;
- To estimate nitrogen and phosphorus discharges from the river basins and identify the nutrients sources, respectively in PR China and in RO Korea.

Expected Outputs

The consultant is expected to deliver the following results:

- Technical description of the watershed model used for estimation of nutrients loading in the hot spots;
- Calculate the nutrients load and identify the nutrients sources, and to propose advice on appropriate nutrient control and reduction schemes for the local government agencies.

Activities

Under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team, the consultant will conduct the following activities.

Output 1: Technical description of the watershed model used for this task

- Make a list of watershed models that can be potentially applied to the river basins for this task;
- Conduct a technical review of the watershed models and select the most suitable model considering the structure, data requirements and other technical aspects of the models;
- Provide a technical description in detail of the selected watershed model.

Output 2: A report for estimation of the nutrients loads and identification of the pollutant sources

- Review the nutrient pollution and eutrophication status in the demonstration area;
- Apply the selected watershed model to estimation the nitrogen and phosphorus discharge, including the demonstrate results of model calibration and validation.
- Estimation the nutrient loads from land-based sources in the demonstration area, analysis the temporal and spatial distribution sand the mass balance results of nitrogen and phosphorus for each of the river basins;
- Identify the main nutrient sources in the study area and evaluate the appropriate demonstration effectiveness for the other regions in the YSLME;
- Based on the annual loads of nutrients and contribution of different pollution sources, propose advice on appropriate nutrient control and reduction schemes for the local government agencies;

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will provide the background information and documents of completed and proposed projects, and provide logistics support to field trip to project sites.

Timing
The consultancy will begin in October 20, 2017 and will finish in March 31, 2018.

Reporting
The subcontractor will submit reports in accordance with the following timeframe:
1. by November 1, 2017, submit the method of calculation; and
2. by March 31, 2018, submit the final report.

All reports should be submitted in English. Reports should be submitted to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org

Activity 1 of Output 3.1.2 (REV)
Diagnostic analysis of ID sources & sinks of pollutants, review available data & info, report environmental status and trends of YS, and identify gaps and explore mechanisms for data and information sharing between the two countries

TERMS OF REFERENCE

Diagnostic analysis of sources & sinks of pollutants, and environmental status and trends of YS

Consultancy classification:	Individual consultant
Budget line:	71200, Activity 1 of Output 3.1.2, Component 3. Budget: USD 8,000;
Estimated start of work:	April 2018 – June 2019

Objectives
- To assess environmental status and spatial and temporal trends of Yellow Sea;
- To Diagnostic analysis of ID sources & sinks of pollutants;
- To conduct gap analysis and develop data and information sharing mechanisms

Expected Outputs
The consultant is expected to deliver the following results:
- Report on Marine environmental status and trends of the Yellow Sea, including sources & sinks of pollutants and environmental status and temporal & spatial trends;
- Data sharing mechanism framework, including the principle and methods of sharing and exchanging Data and Information products

Activities and main outputs
Under supervision of the Chief Technical Advisor and technical inputs from RWG-P in close collaboration with the local project team, the consultant will undertake the following activities:

Output 1: Report on Marine environmental status and trends of the Yellow Sea
- Diagnostic analysis of sources & sinks of pollutants.
- Collect information and data about distribution of pollution sources provided by PR China and RO Korea.
- Analysis of pollution sources' types, spatial distribution and main pollutants flux. The types of pollution include industrial, domestic sewage and waste disposal; the channels of pollution include sewage, river and etc.
- Review of available data & info, Analysis of the status and temporal & spatial trends of YS seawater quality.
- Evaluation of seawater quality status and trends of the YS area, by means of interpolation analysis and regression analysis. The method of interpolation is inverse distance weighting.

Output 2: Data sharing mechanism framework

- Analysis of the policy of monitoring data sharing in PR China's Marine environment and the existing problems with international data sharing, and propose a framework for the construction of relevant sharing mechanism.
- Propose recommendations for data sharing services
- Determine the data sharing management system.
- Establish data sharing management mechanism to supervise and manage data sharing reviews and services, and ensure the safe and reasonable use of data.

Inputs

UNDP/GEF YSLME Phase II Project Management Office (PMO) will provide the background information and documents, and will be responsible for providing logistics support to facilitate travel to project sites and meeting with relevant stakeholders, including access to information and data about the project sites.

Timing

The consultancy will begin in April 2018 and complete in June 2019.

Reporting

The consultant needs submit the following reports within the specified timeframe:

1. By May 30,2018, submit a draft framework plan for marine environmental status and trends of the Yellow sea;
2. By November 1, 2018, submit the final report on marine environmental status and trends of the Yellow sea; and
3. By June 30, 2019, submit data sharing mechanism framework.

The consultant can submit reports electronically to the PMO. All reports should be submitted in English.

Competencies

- A good understanding of marine environmental status and trends of the Yellow sea.
- Advanced university education at MSc or Ph.D. level with expertise in the area of biology, marine sciences or natural resource management.
- At least 14 years of professional experience in marine environmental monitoring and assessment
- Strong skills in analysis and evaluation, and rich experiences in implementing environmental projects
- Ability to develop high quality reports and publications in English

Activity 2 of Output 3.1.2 (REV)

Support for monitoring and data acquisition for sharing on pollutants from atmosphere-based sources

TERMS OF REFERENCE

Subcontract for monitoring and acquisition of data about atmospheric nutrients and heavy metals in the Yellow Sea

Consultancy classification:	subcontract (NMEMC)
Budget line:	72100, Activity 2 of Output 3.1.2, Component 3. Budget: USD 50,000;
Estimated start of work:	Mid-October 2017 – mid March, 2019

Objectives

The objective underlying the proposed consultancy is to collect data about nutrients and heavy metals from atmospheric dry and wet deposition in 1~2 sites, construct the assessment method and assess the total amounts of nitrogen and phosphate in various forms from atmosphere-based sources in the Yellow Sea.

Expected Outputs

The subcontractor is expected to deliver the following results:

- Provide atmospheric deposition monitoring or acquisition data for one year at least.
- Establish the method for assessing deposition flux of nitrogen and phosphate in various forms from atmosphere-based sources.

Activities

Under supervision of the Chief Technical Advisor and technical guidance of RWG-P of YSLME Phase II Project, in close collaboration with the local project team, the subcontractor will:

- Investigate the level of atmospheric nutrients such as nitrogen, phosphorus and some heavy metals in atmospheric aerosols and precipitation in different seasons in the Yellow Sea, which were based on 1~2 coast base stations.
- Obtain particle size distribution of atmospheric particle pollutants and meteorological data in order to determine the dry sedimentation rate of particulate pollutants in typical area of the Yellow Sea.
- Establish the assessment method based on the Williams model and assess the total amounts of pollutants in various forms from atmosphere-based sources in the Yellow Sea.
- Obtain air quality data for 1~2 typical coastal cities along the Yellow Sea as auxiliary data for Transboundary Diagnostic Analysis.
- Propose effective cooperation between the two countries to reduce pollutants deposition from atmosphere-based sources in the Yellow Sea.

Reporting

The subcontractor will submit reports in accordance with the following timeframe:

1. By March 10, 2018, method for assessing deposition flux of nitrogen and phosphate in various forms from atmosphere-based sources;
2. by March 15, 2019, a detailed assessment report for nutrients from atmosphere-based sources in the Yellow Sea. Key elements of the report include:

o Review of nitrogen, phosphorus and some heavy metals marine atmospheric deposition;
o Characteristics of Air Pollution in Typical Coastal Cities along the Yellow Sea in China
o Level and seasonal distribution of nutrients from atmosphere-based sources in the Yellow Sea, which will be based on monitoring and acquisition data;
o Assessment of deposition flux of pollutants from atmosphere-based sources.
o Proposed management actions to reduce the atmosphere-based pollution.

The subcontractor will submit reports electronically to the PMO. The report should be submitted in English.

Activity 3 of output 3.1.2 (REV)

Support for monitoring and data acquisition for sharing on fertilizer use

TERMS OF REFERENCE

Monitoring and acquisition data for sharing on fertilizer use to reduce land-based source pollutant discharges

Consultancy classification:	subcontract (NMEMC)
Budget line:	72100, Activity 3 of Output 3.1.2, Component 3. Budget: USD 50,000;
Estimated start of work:	Mid-October 2017 – mid March, 2019

Background

Component 3 of UNDP/GEF YSLME Phase II Project addresses improving ecosystem carrying capacity with respect to regulating and cultural services. In Outcome 3.1 of Component 3 entitled "Ecosystem health improved through a reduction in pollutant discharges (e.g. nutrients) from land-based sources, the project will support a series of activities that focus on the development and improvement of the strategies and methods to efficiently reduce the pollutant discharge from land-based sources of YS, especially the nutrient. Output 3.1.2 of Outcome 3.1 specifically leads to construct an effective mechanism to monitor and acquire data and information for sharing regarding the sources and sinks of contaminants. As known, fertilizer wash off from agricultural activities has been considered as an important reason of the excessive nutrient supply to coastal marine waters. As one of proposed activities, enhanced marine environmental data and information sharing on fertilizer use is necessary and meaningful for better understanding of the current status of nutrient discharge in the YS, and the effects of the relevant pollutant control measures. At the national and regional level, data and information are required for the preparation and adjustment of national regulations and economic strategy.

Objectives

The development objective underlying the proposed consultancy is to enhance environmental quality and reduce pollutant discharge from land-based sources of the Yellow Sea by taking effective actions to monitor and improve the use of fertilizers.

The immediate objective underlying the proposed consultancy is to monitor and acquire data and information of fertilizer use in the coastal provinces and cities along the Yellow Sea, and construct an assessment method to estimate the total amounts of nitrogen and phosphate caused by fertilizer use.

Expected Outputs

The subcontractor is expected to deliver the following results:

- A data report of monitoring and evaluation of the amount of fertilizer use in agricultural activities in coastal provinces along the Yellow Sea, including the 3 provinces of PR China and the 5 provinces of RO Korea, for one year at least.
- An assessment method for estimating the total amounts of nitrogen and phosphorus caused by fertilizer use.

Activities

The consultant under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team, the consultant will conduct the following activities:

- Conduct a review of the current status of fertilizer use in the YS, including relevant information about fertilizer use in both countries, the characteristic parameters of the agricultural-used fertilizer, the policies and regulations for the control of nonpoint source pollution, and other information and data available currently.
- Collect and evaluate data and information of the amounts of fertilizer use in the YS coastal provinces, including the 3 provinces of PR China and in the 5 provinces of PO Korea.
- Establish an assessment method to estimate the total amounts of nitrogen and phosphorus attributed by fertilizer use in the coastal provinces along the Yellow Sea.
- Analyze the characteristic of fertilizer use in YS, and assess the status and trends of the stresses caused by fertilizer use.
- Prepare and submit the study report of fertilizer use in the Yellow Sea.

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will provide the relevant background information and documents

Timing

The consultancy is planned to start begin in mid-October 2017 and will complete in March 31 2019.

Reporting

The consultant will prepare and submit a detailed assessment report for fertilizer usein the Yellow Sea. Key elements of the report include:

1. By March 10, 2018, assessment method for estimating the total amounts of nitrogen and phosphorus caused by fertilizer use;
2. draft data report of fertilizer use in the YS coastal.
3. By March 2019, detailed assessment report for fertilizer use in the Yellow Sea coastal area.

The subcontractor will submit reports electronically to the PMO. The report should be submitted in English.

Activity 4 of Output 3.1.2 (REV)

Support for monitoring and data acquisition for sharing from sea-based sources

TERMS OF REFERENCE

Assessment of the sea-based mariculture pollution and ship-based pollution in the Yellow Sea in PR China

Consultancy classification:	subcontract (NMEMC)
Budget line:	72100, Activity 4 of Output 3.1.2, Component 3. Budget: USD50,000;
Estimated start of work:	Mid- November 2017 – mid March, 2019

Objectives

The objective underlying the proposed consultancy is to establish the assessment model of nutrients discharge from sea-based mariculture, pollutants discharge from ships and assess the total amounts of nitrogen and phosphate in various forms discharge from mariculture and pollutants discharge from ships in coastal areas of the Yellow Sea in PR China.

Expected Outputs

The subcontractor is expected to deliver the following results:

- Methodologies for monitoring and assessment of nutrients discharge from sea-based mariculture and pollutants discharge from ships;
- An assessment report of the amounts of nutrients discharge from sea-based mariculture and pollutants discharge from ships in the Yellow Sea in PR China.

Activities

Activities include but not necessarily limited to the following tasks:

- Establish the assessment model of nutrients (nitrogen and phosphate) in various forms discharge from different culture systems of sea-based mariculture and pollutants discharge from ships in the Yellow Sea.
- Investigate the yield of different cultured organisms (e.g., fish, shellfish, etc.) as well as its nutrients discharge coefficient in the cage culture and raft culture systems during the cultured period in coastal areas of the Yellow Sea.
- Investigate the yield of non-feeding organisms (mainly filter-feeding bivalves, such as mussels, oyster, scallops, etc.) and the content of nitrogen and phosphate in vivo, then assess the amounts of nitrogen and phosphate uptake from the marine environment in the Yellow Sea during cultured period by the organisms.
- Assess the amounts of nitrogen and phosphate discharge from sea-based mariculture in the Yellow Sea in PR China based on the established assessment model and the investigation data.

- Investigate the type of ships, classification of the pollutants (oily sewage, domestic sewage, ship garbage, etc.) discharged from ships and other required information, then assess the amounts of ship-based pollutants of different classification in the Yellow Sea in PR China based on the established assessment model and the investigation data.
- Present management actions to reduce the nutrients discharge from sea-based mariculture and pollutants discharge from ships under the diagnostic analysis of the feature of sea-based mariculture pollution and ship-based pollution in the Yellow Sea in PR China.

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will provide the background information and documents.

Timing

The consultancy will begin in November 2017 and complete in December 2019.

Reporting

The subcontractor will prepare and submit a detailed assessment report for sea-based mariculture pollution and ship-based pollution in YSLME in PR China. Key elements of the report include:

- Current status of sea-based mariculture pollution and ship-based pollution in PR China;
- Challenges and difficulties;
- Monitoring and assessment method;
- Assessment of nutrients discharge from mariculture and pollutants from ships;
- Management actions to reduce the pollution.

The consultant will submit reports in English electronically to the PMO.

Activity 1 and 2 of Output 3.2.1 (REV)

Develop regional strategy for using wetlands as nutrient sink, cost-effective and sustainable mechanism to treat municipal wastewater & sewage: good practices and experience sharing and learning

TERMS OF REFERENCE

Develop regional strategy for using wetlands as nutrient sink, and synthesize good practice and knowledge to treat municipal wastewater and sewage

Consultancy classification: International consultant
Budget line: 71200, Activity 1 of Output 3.2.1, Component 3. Budget: USD16,000;
Estimated start of work: February 2018 – December 31, 2018

Objectives

The objective underlying the proposed consultancy is 1) to develop a regional strategy for using wetlands as nutrient sink, especially for the coastal wetlands; and 2) to catalyze investment in cost-effective and environmentally friendly pollution reduction from land-based sources through wetland restoration and construction to improve the ecosystem health of the Yellow Sea.

Immediate Objectives

The objectives underlying the proposed consultancy are:

- Review of the status of coastal wetlands in nutrient removals for the Yellow Sea coastal area, and the location, the method, the principle and the results of nutrient removal projects up to 2016 in PR China and RO Korea, and to compare the advantages and disadvantages;
- To strategize approaches and methods to enhance investment, capacity, knowledge and awareness raising to mainstream use of wetland into urban planning, ocean park development, coastal wetland restoration projects and other investment decisions to enlarge wetland sink areas;
- to synthesize and document knowledge in using wetland as nutrient sinks for improving the ecosystem health of Yellow Sea for replication of good practices for investment.

These objectives will also support of achieving SDG 14 and implementing CBD, RAMSAR and other relevant Conventions.

Expected Outputs

The consultant is expected to deliver the following results:

- A review report of past and present and future projects in using wetland as nutrient sink, especially focused on the Yellow Sea Coastal Area, project designs, investment modalities, cost-effectiveness, ecosystem services generated from these projects and lesson learnt; and
- Proposed recommendations on strategies, approaches and methods to enhance investment, capacity, knowledge and awareness raising to mainstream use of wetland into urban planning, ocean park development, coastal wetland restoration projects and other investment decisions to enlarge wetland sink areas;
- Four case studies detailing the design, implementation modalities, results and services of wetland and species in removing nutrients from the projects, and cost-benefits of such projects;
- An overview of technologies, cost-benefits, cost and effect and value of wetland services in restoring coastal and marine environment.

Activities

Activities include but not necessarily limited to the following tasks:

Output 1: Synthesis for the practices using wetland as nutrient sinks in the Yellow Sea:

- Conduct desk review to assess the status and trends of the threats, stresses and underlying causes on nutrient load in the Yellow Sea, especially focused on the underlying causes such as physical factors, policy, biological factor, etc.
- Desk review to coastal wetlands distribution of Yellow Sea Coastal area, identifying the vegetation, area, history, sediment and water condition, and ecological service of these wetlands.
- Survey the past and present and future projects mainly concentrated on using wetland as nutrient sinks based on the published and grey literatures focusing on project designs, investment modalities, cost-effectiveness, ecosystem services generated from these projects and lesson learnt; and then teasing out the work concepts, researching progress, technical proposal, mainly focused on the tackled problem, the solutions and the efficiency, etc.
- Analyze constraints, opportunities, threats, issues, problems and capacity needs and identify solutions through consultation with stakeholders and interest groups, forming a series technical scheme in nutrient removals based on coastal wetlands.
- Incorporate comments into a final report, and then submit a final draft in electronically (in English).

Output 2: Proposed recommendations on strategies, approaches and methods to enhance investment, capacity, knowledge and awareness raising to mainstream use of wetland into urban planning, ocean park development, coastal wetland restoration projects and other investment decisions to enlarge wetland sink areas

- Facilitate the conduct of framework YSLME nutrient removal projects, which included develop explicit goals, time-bound targets and actions in line with the proposed solutions to assist the bordering countries of YSLME to implement provisions of the CBD, Ramsar and other conventions of a regional approach;
- Identify areas of the coastal wetland as nutrient remover, especially for these projects, mainly using the criteria for selection, taking into account of both social and cultural context as well as and assessment result, propose a series project at regional level for improved ecosystem services.
- Identify opportunities to enhance investment, capacity, knowledge and awareness raising to mainstream use of wetland into urban planning, ocean park development, coastal wetland restoration projects and other investment decisions to enlarge wetland sink areas;
- Consolidate the assessment results into a concrete proposal of recommendations for using wetlands as nutrient sinks;
- Taking into account the comments from the workshop, revise and develop the proposal into a program for the YSLME management.

Output 3: Four case studies detailing the design in theory and practice, monitoring system, results and services of wetland and species in removing nutrients from the projects, and cost-benefits

- Prepare a synthesis report of latest developments in using wetland as nutrient sinks to diversify approaches for coastal wetland restoration with amplified spinning effects;
- To select and agree on wetland restoration modalities, including 1) return fish ponds and salt-making ponds to bays and coastal marshes, such as Wuyuan Bay, Xiamen; 2) using wetland for tertiary treatment associated with sewage treatment plants, such as Ningbo World Bank Project; 3) use species and aquaculture to achieve the co-benefits of sustainable harvest and environmental performance, such as intertidal shell fish farming in RO Korea; and 4) nutrient bio-extraction in Long Island sound, New York
- Prepare four case studies detailing the design in theory and practice, monitoring system, results and services of wetland and species in removing nutrients from the projects, and cost-benefits of such projects, especially in the YS, if applicable;
- Document the investment modality for replication.

Inputs

UNDP/GEF YSLME Phase II Project Management Office (PMO) will facilitate the access to information, reports, contacts and facilitate visits to project sites.

Timing

The consultancy will begin in February 26, 2018 and complete in December 31, 2018.

Reporting

The consultant will produce the following reports within the specified timeframe:

1. By March31, 2018, a draft synthesis report on the use wetlands as nutrient sink and a concrete proposal of recommendations for using wetlands as nutrient sinks;
2. By October 31, 2018, a draft synthesis report and case studies for review; and
3. By December 31, 2018, the final report and case studies.

The consultant can submit reports in English electronically to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org.

Competencies

- A good understanding of development and coastal wetlands environment contexts of North East Asia
- Advanced university education at MSc or Ph.D. level with expertise in the area of biology, marine sciences or natural resource management
- At least 7 years of professional experience in coastal and marine ecosystems
- Strong skills in analysis and evaluation, and experience in implementing environmental projects
- Ability to produce high quality reports, publications in English

Activity 1 of Output 3.3.1 (REV)

Review of policies and regulations in China and RO Korea dealing with pollution control and assess compliance with UNCLOs, the future WE Want, multi-lateral environmental agreements and programs ratified by both countries, and prioritize legal and regulatory reforms in both countries

TERMS OF REFERENCE

Legal Expert to review country compliance with international ocean-related environmental agreements

Consultancy classification:	Individual consultant
Budget line:	71200, Activity 1 of Output 3.3.1, Component 3. Budget: USD8,000;
Estimated start of work:	January 2018 until December 31, 2018

Background

Component 3 of UNDP/GEF YSLME Phase II Project aims at improving ecosystem carrying capacity with respect to regulating and cultural services. In Outcome 3.3 of Component 3 entitled "Strengthened legal and regulatory processes to control pollution", the project will support several Activities leading to four project targets, to be concise,1) regional guidelines for micro-plastics monitoring and assessment; 2) new incentives and measures adopted in coastal cities in support of recycling economy; 3) new provincial regulations to improve water quality; and 4) new profitable businesses developed from waste reuse and recycling.

As one of the proposed activities, Activity One may be further broken into three sub-activities which are as follows: 1) review of policies and regulations in China dealing with pollution control, 2) assess compliance with UNCLOs, the Future We Want, multi-lateral environmental agreements and programmes ratified by PR China, and 3) prioritize legal and regulatory reforms at domestic level. Satisfactory accomplishment of sub-activity one provides good reference for achieving the four project targets. Drafting new guidelines and regulations, adopting new incentives and measures, and developing new green profitable businesses should all be conducted based on the current legal and regulatory framework. On the other hand, ideas, norms, plans and/or techniques etc. arising from the other four Activities may provide valuable feedback to the process of conceiving legal and regulatory reforms. Review of current policies and regulations on pollution control can lead to not only a library for policy-makers for informed decisions but also to precisely find their inherent inconsistencies and gaps including those as described in SAP for YSLME and propose targeted solutions. Compliance assessment with applicable agreements/programmes establishes a two-way channel by which domestic regulations and policies can be analyzed and improved to be compliant with international or regional standards and best domestic practices may be identified and populated into related agreements/programmes in future negotiations. All in all, Activity One is indispensable for Outcome 3.3 and thus Component 3. In this context, the project plans a consultancy with the following terms of reference (TOR).

Objectives

The objective underlying the proposed consultancy is to enhance the regulating services of YSLME in particular by strengthening the legal and regulatory processes to control pollution through, inter alia, improving pollution-concerned legal and policy system at domestic level by ontology analysis and international/regional compliant comparative assessment taking into account the principles and approaches of YSLME-based integrated coastal and marine management.

Expected Outputs

The consultant is expected to deliver the following results:

- An inventory of domestic laws/regulations/policies dealing with pollution control in PR China
- An inventory of international/regional environment agreements/programmes effective for PR China with respect to pollution control
- An analysis report concerning inconsistencies and gaps of domestic laws/regulations/policies dealing with pollution control in PR China and compliance assessment with relevant environment agreements/programmes, together with recommendations on legal and regulatory reforms

Activities

The consultant under supervision of the Chief Technical Advisor and technical guidance of RWG-G and P in close collaboration with the local project team will conduct the following activities to achieve the three outputs:

Output 1: An inventory of domestic laws/regulations/policies dealing with pollution control

- With assistance from legal intern in PMO and National Coordinators from PR China and RO Korea, to conduct an inventory of domestic laws, regulations, policies of PR China and RO Korea in relation to pollution control, reduction and management;
- Review contents of above laws, regulations and policies;

Output 2: An inventory of international/regional environment agreements/programme effective both for China and ROK with respect to pollution control

- To conduct inventory of international and regional environment agreements and programs effective in both countries with respect to pollution control, reduction and management. (The inventory should be compiled with four essential parts – an overall introductory review, indexes of contents systematically structured within discretion of the consultant, summaries including simple analysis of important clauses or articles consistent with the index, and copies of the official documents related to pollution control);
- To identify sources of information and download for analysis. Copies and related information of the official documents may be obtained from libraries, reliable internet services, or domestic/international authorities such as local governments, State Oceanic Administration, Ministry of Transport, Ministry of Agriculture, Ministry of Foreign Affairs, and secretariat of relevant organizations, with assistance from legal intern in PMO;
- Provide guidance legal intern in PMO to upload these documents on project website to use the inventories as practical manual for domestic decision makers or executive staff regarding pollution control so that the inventory itself should be easy to understand and specific provisions need to be easily located when needed for reference;
- Incorporate comments and submit the final inventories electronically. The introduction, index, and summaries should be in English while copies of the main texts of the official documents will be in English and could be in Chinese and Korean if possible.

Output 3: An analysis report concerning inconsistencies and gaps of domestic laws, regulations and policies dealing with pollution control in China and compliance assessment with relevant environment agreements/programmes, together with recommendations on legal and regulatory reforms

- Review Outputs 1 & 2 thoroughly by collecting and analyzing background and historical implementation information there of which could include contemporary social, economic and environmental contexts, meeting minutes and reports, guidelines, resolutions or declarations, administrative decisions, court or arbitration judgments, expert opinions, media reports, questionnaire answers, etc.;
- Identify inconsistencies or gaps of domestic laws/regulations/policies with same or different statutory level(s) including the implementation thereof;
- Conduct comparative assessment between Output 1 and Output 2 and identify potentially non-compliant clauses or issues;
- Determine YSLME-based integrated management principles and approaches for coastal and marine pollution taking into account domestic management realities, project targets, progress of the other Activities, YSLME Phase I Project achievements, outcomes of review of Output 2, and other well-acknowledged ideas, doctrines or techniques;
- Identify gaps existing between domestic laws/regulations/policies and outcomes of Step 4;
- Propose new regulations or amendments based on Steps 2, 3, and 5 as appropriate;
- Summarize the best domestic practices for pollution control which are not covered by but hopefully could contribute to the future international/regional regimes;
- Form the final analysis report by compiling the outcomes of the aforementioned Steps and recommend legal and regulatory reforms with clear priorities and goals.

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will assist to provide the background information and documents, and will be responsible for providing financial support and the logistics support to participation in designated workshops or meetings and spread of questionnaires.

Timing

The consultancy will begin in late-November 2017 and complete in June 20, 2018.

Reporting

The consultant will produce the following reports within the specified timeframe:

1. By March 31, 2018, submit the inventory of

a. domestic laws/regulations/policies dealing with pollution control in PR China;

b. international/regional environment agreements/programmes effective both for China and ROK with respect to pollution control;

2. By December 31, 2018, submit the analysis report concerning inconsistencies and gaps of domestic laws/regulations/policies dealing with pollution control in PR China and compliance assessment with relevant environment agreements/programmes, together with recommendations on legal and regulatory reforms.

The consultant can submit reports electronically to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org. All reports should be submitted in English unless otherwise indicated in the present TOR.

Competencies

- Advanced university education at Master or Ph.D. level with expertise in area of law or policy of sea
- At least 5 years of professional experience in coastal and marine management and technical support
- Strong skills in analysis and evaluation, and ability to communicate and produce high-quality reports/publications in English
- Experience with international/regional marine environment treaties/initiatives/programmes/projects

Activity 4 of Output 3.3.1 (REV)
Support to develop regulatory measures for marine litter monitoring

TERMS OF REFERENCE

Developing regulatory measures for marine litter management in pilot areas of Yellow Sea in PR China

Consultancy classification: subcontract (NMEMC)
Budget line: 71200, Activity 4 of Output 3.3.1, Component 3. Budget: USD48,000;
Estimated start of work: May 06, 2018 and end in April 30, 2019

Background and Justification
Marine litter, including plastics and microplastics, is considered "a global concern affecting all the oceans of the world". It has been observed everywhere: from coastal areas to remote areas far from any anthropogenic pollution sources; from surface waters throughout the water column to the deep water and ocean sediments; and from the equator to the poles, including trapped in sea ice. The pollution is significant and widespread, with plastic debris found on even the most remote coastal areas and in every marine habitat. More than 800 marine species have been found to interact with marine litter to date, with ingestion and entanglement the two main types of interaction. Based on the transboundary diagnostic analysis of the Yellow Sea, one of the major environmental problems is the marine litter in the Yellow Sea.

Marine litter commonly stems from shoreline and recreational activities, commercial shipping and fishing, and dumping at sea. The majority of marine litter (approximately 80 per cent) entering the seas and oceans is considered to originate from land-based sources. Marine litter is as much a transboundary global problem as well as a local issue with a multitude of sources. Litter pollution in the marine and coastal environment is a challenging restoration and governance issue. Similar to many environmental problems, marine litter pollution is transboundary and therefore the governance solutions are complex. Reducing litter inputs and impacts on marine ecosystems is the first critical step in marine environment restoration. It requires a variety of solutions at local, regional, national, and global scales.

With the problem worsening, formal governance through international institutions or instruments, regional organizations or governments alone cannot resolve this exponentially increasing environmental problem. It has been recognized the limitations of existing international law and are calling for the development of a new international instrument specifically addressing marine litters. Although this is an important way forward, the process will be complex, may not be supported by all coastal states, and will not come into force any time soon.

A faster way forward might be to develop regulatory measures for marine litter monitoring, disposal, handling, reuse, and recycle in pilot site to enable investment on recycling economies. Dalian and Weihai, will be selected as the pilot cities. It is expected that this project will contribute to knowledge building in YSLME.

Objectives
The objective underlying the subcontract is to provide regulatory measures for marine litter monitoring, disposal, handling, reuse and recycle in pilot province or city of Yellow Sea. The project will support a series of activities leading to enhanced marine litter management capacity, and development and application of regional guidelines on the control of marine litter.

Expected Outputs

The subcontractor is expected to deliver the following results:

- Assessment of existing status of marine littler and regulatory and policy framework in the management of marine litter(micro-plastics) in Weihai City;
- Proposal of policy or financial incentives to incentivize investment by private sector in prevention, control, recycling, reuse of litter;

Under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team, the subcontractor will conduct the following activities.

LOT 1

- Review of historical monitoring data of marine litter (including microplastics) in Weihai City
- Assessment of the types, distribution, quantity and composition, sources and identification of stakeholders of marine litter (including microplastics), and identify the "hotspot" area.

LOT 2

- Review of current policies and regulations as well as best available technologies for reducing litter and assess cost efficiencies of their application in other cities in applicable
- Identification of policy, regulatory framework, financial and technological gaps based on historical and second-hand monitoring data assessment
- Drafting proposals of policy or financial incentives for consideration by Weihai City to incentivize investment by private sector in prevention, control, recycling, reuse of litter (including microplastics) originated from identified sources;

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will facilitate the access to information and reports of completed and proposed projects, and provide logistics support to field trip to project sites.

Reporting

The applicant should submit following reports:

1. LOT 1: Inception report detailing the process and methodologies, data or information collection, team structure and workplan, to be submitted electronically in English within two weeks upon signing of the contract;
2. LOT 1: Status and trends of marine littler in Weihai City, before June 20, 2018 (4 copies in Chinese and 4 copies in English) and electronically; Percentage of Total Price (30%)
3. LOT 2: gaps in regulatory and policy measures in the management of marine litter and microplastics, in Chinese and English, to be submitted by November 1, 2018 in hard copies (4 copies in Chinese and 4 copies in English) and electronically; Percentage of Total Price (30%)
4. LOT 2: Proposals for regulatory and financial policies to incentivise investment by private sector in monitoring, reduce, recycling and reuse of marine litter and microplastics, in Chinese and English, to be submitted by April 30, 2019, in hard copies (4 copies in Chinese and 4 copies in English) and electronically. Percentage of Total Price (40%)

All reports should be submitted in English and Chinese. Reports should be submitted to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org.

Minimum Requirements

The applying entity should have a minimum of 5 years of consultancy experiences in the subject area is required. Task Manger should have a minimum of 7 years of professional experiences in similar areas, core members with at least 3 years of similar consultancy experience, while other team members should have at least one-year professional experience.

Activity 1 of Output 3.4.1 (REV)

Regional review of existing policies and regulations regarding solid waste disposal as well as technologies for reducing production including recycling opportunities

TERMS OF REFERENCE

Regional review of existing policies and regulations regarding solid waste disposal as well as technologies for reducing production including recycling opportunities

Consultancy classification: subcontract (NMEMC)
Budget line: 72100, Activity 1 of Output 3.4.1, Component 3. Budget: USD8,000;
Estimated start of work: November 01 2017 and end in June 30, 2018

Background and Justification

The prevalence of marine litter is the result of many different factors, including changing production and consumption patterns, inadequate waste management, and gaps in regulation of waste materials. The diverse sources require a comprehensive response. Given the practical challenges of removing decades of accumulated litter from the oceans, it is clear that prevention, rather than remediation, is critical. Accordingly, countries frequently utilize a variety of laws and policies to prevent, manage, and reduce the proliferation of marine litter. Many of these approaches are part of the general frameworks to reduce the generation and spread of solid waste, rather than being part of frameworks specifically designed to address marine litter. Policies and laws need to address not only the removal of litter but are generally more successful when they govern the production, use, and disposal of products that would otherwise become marine litter.

Based on the transboundary diagnostic analysis of the Yellow Sea, one of the major environmental problems is the marine litter in the Yellow Sea. The increase in marine litter and construction of concrete structures such as jetties and wharfs has also increased the habitat available to the asexual reproductive stage of the jellyfish, another environmental issue in this region. In order to help to develop regulatory measures to control and reduce regional marine litter from the source, the project will conduct an assessment and review regarding solid waste disposal as well as technologies for reducing production including recycling opportunities. It is expected that this review will contribute to knowledge building in YSLME.

Objectives

The objective underlying the proposal is to catalyze strengthening regional and national governance for the production, use, and disposal of products that would otherwise become marine litter.

Immediate Objectives

The objectives underlying the proposal are:

- to map and review national regulatory frameworks and other instruments to identify gaps in addressing solid waste disposal, and catalyze to make an informed decision about priorities for preventing marine litter at the source.

Expected Outputs

The subcontractor is expected to deliver the following results:

- A scoping study report with recommendations on policies and regulations regarding solid waste disposal as well as technologies for reducing production including recycling opportunities.

Activities

Under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team, the subcontractor will conduct the following activities.

- Conduct desk review to analyze laws and policy that address production and consumer use of a variety of items that end up as marine litter, especially the most abundant type of marine litter, plastic, from its incipient "nurdle" or pre-manufacturing resin stage to ubiquitous and persistent consumer goods such as single-use plastic bags and utensils.
- Conduct desk review to analyze legislation governing waste disposal into the marine environment, including land-based disposal; cleanup of land-based waste; abandoned, lost, and discarded fishing gear; and litter from ships.
- Identify gaps in addressing solid waste disposal at regional level.
- Prepare the draft scoping study report with recommendations on policies and regulations regarding solid waste disposal as well as technologies for reducing production including recycling opportunities. Submit it for consultation and review by members of the Regional Working Group on Pollution of the YSLME Phase II Project.
- Incorporate comments and submit a final study report electronically.

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will facilitate the access to information and reports of completed and proposed projects, and provide logistics support to field trip to project sites.

Timing

The subcontractor will begin in November 01 2017 and end in June 30, 2018.

Reporting

The subcontractor will produce:

1. by end of October, an activity report and draft scoping study report;
2. by July 30, 2018, the final report.

All reports should be submitted in English.Reports should be submitted to Mr. YinfengGuo, CTA/Manager at email: yinfengg@unops.org.

Activity 2 of Output 3.4.1 (REV)

Develop & test monitoring system, and conduct a regional baseline survey of marine litter in collaboration with other relevant organizations

TERMS OF REFERENCE

Regional baseline survey of marine litter

Consultancy classification:	subcontract (NMEMC)
Budget line:	72100, Activity 2 of Output 3.4.1, Component 3. Budget: USD8,000;
Estimated start of work:	November 012017 and end in June 30, 2018

Background

Marine litter, including plastics and microplastics, is considered "a global concern affecting all the oceans of the world". It has been observed everywhere: from coastal areas to remote areas far from any anthropogenic pollution sources; from surface waters throughout the water column to the deep water and ocean sediments; and from the equator to the poles, including trapped in sea ice. The pollution is significant and widespread, with plastic debris found on even the most remote

coastal areas and in every marine habitat. More than 800 marine species have been found to interact with marine litter to date, with ingestion and entanglement the two main types of interaction. Based on the transboundary diagnostic analysis of the Yellow Sea, one of the major environmental problems is the marine litter in the Yellow Sea.

Marine litter commonly stems from shoreline and recreational activities, commercial shipping and fishing, and dumping at sea. The majority of marine litter (approximately 80 per cent) entering the seas and oceans is considered to originate from land-based sources. Marine litter is as much a transboundary global problem as well as a local issue with a multitude of sources. Litter pollution in the marine and coastal environment is a challenging restoration and governance issue. Similar to many environmental problems, marine litter pollution is transboundary and therefore the governance solutions are complex. Reducing litter inputs and impacts on marine ecosystems is the first critical step in marine environment restoration. It requires a variety of solutions at local, regional, national, and global scales.

It is important to understand marine litter distribution in the environment and their implications on marine habitats and marine biota. Development of monitoring (early warning) system, and conducting a regional baseline assessment of marine litter, will help understand marine litter (micro-plastic) pollution characteristics, such as temporal and spatial distribution, and their sources etc. Assessment of the distribution of marine litter in the marine environment in the Yellow Sea will also contribute to identify the "hotspot" area, and promote development of regional or local the management measures.

Objectives

The objective underlying the subcontract is to draft regional baseline survey report, and provide data support for marine waste management in the Yellow Sea region. The project will support a series of activities leading to enhance marine litter monitoring, promote to establish regional monitoring (early warning) system.

Activities

The following activities will be undertaken:

- Review published papers which addressing the distribution of marine litter (microplastic) in surface water, beaches, and biota,
- Analyze the challenge of marine litter and microplastic, including definition of size, categories, shape, baseline etc., as well as sampling and laboratory analysis methods
- Draft a marine litter (microplastics) monitoring scheme
- Assessment of regional marine litter (microplastics) pollution status
- Drafting report on status of marine litter(microplastics) in the Yellow Sea

Expected Outputs

The subcontract is expected to deliver the following results:

1. Provide Regional marine litter baseline assessment report

Timing

The subcontractor will begin in November 012017and end inJune30, 2018.

Reporting

The subcontractor will produce the following reports within the specified timeframe:

1. By March 31 2018, prepare and submit a draft of assessment report on marine litter pollution, key elements of the contents include:
   a. Status of marine litter (microplastics) pollution
   b. Challenges and difficulties for marine litter monitoring and assessment
2. By June 30, 2018, submit final assessment report on marine litter pollution

Competencies

- A good understanding of marine litter monitoring and assessment
- Advanced university education at MSc or Ph.D. level with expertise in the area of marine litter monitoring and management
- At least 5 years of professional experience in marine litter research.
- Strong skills in analysis and evaluation, and experience in implementing environmental projects
- Ability to produce high quality reports and publications in English

Payment and Submission

The consultant will be paid for a lump sum of USD 8,000 for consultancy upon submission of the first report (50%) and the final report on marine litter management (50%) to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org.

Activity 3 of output 3.1.1 (REV)

Review of control mechanisms from point sources and evaluate facilities and equipment to control/reduce discharge from industrial and municipal sources and control/mitigation mechanism of pollution from point sources

TERMS OF REFERENCE

Consultant to synthesize knowledge on control of pollution from industrial and municipal sources

Consultancy classification:	Individual consultant
Budget line:	71200, Activity 3 of Output 3.1.1, Component 4. Budget: USD16,000;
Estimated start of work:	November 1, 2017 and December31, 2018

Objectives

The objective underlying the proposed consultancy is to review of pollutant control mechanisms and evaluate facilities and equipment to reduce discharge from industrial and municipal sources through online monitoring and control to improve the ecosystem health of the Yellow Sea.

Immediate Objectives

The objectives underlying the proposed consultancy are:

- To synthesize and document knowledge in using pollution control technologies for improving the ecosystem health of Yellow Sea for replication of good practices for investment

Expected Outputs

The consultant is expected to deliver the following results:

- A study report with recommendations on discharge control mechanisms from point sources.
- A retrospective analysis report of evaluate facilities and equipment to reduce discharge especially the waste water from point sources; and
- To develop and update discharge control and mitigation plan and mechanisms from point sources.

Activities

The consultant under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team will conduct the following activities:

- To Prepare a desk review report of latest developments in using facilities and equipment to mitigate pollution for replication and prepare practice note for dissemination;

- To analyze factors leading to, or potentially leading to the achievement of discharge control, or failures of the control mechanisms, including institutional, political, technical, capacity development and other factors;
- Conduct prospective assessment of ecological benefits of proposed control plan and update mitigation plan or design project which can reduce discharge from point sources

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will facilitate the access to information and reports of completed and proposed plans and projects, and provide logistics support to field trip to point sources.

Timing

The consultancy will begin in 1 November, 2017 and complete on December 31, 2018.

Reporting

The consultant will produce the following reports with specific timeframe:

1. By March 31, 2018, submit the study report with recommendations of discharge control mechanisms from at least one site; and
2. By May 31, 2018, submit the retrospective analysis report of evaluate facilities and equipment to reduce discharge from point sources; and
3. By December 31, 2018, submit the final proposal for update guidelines or plans on controlling pollutant and discharge from YSLME area.

All reports should be submitted in English. Reports should be submitted to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org.

Competencies

- A good understanding of discharge control mechanisms
- Advanced university education at MSc or Ph.D. level with expertise in the area of pollutant control and marine litter management
- At least 5 years of professional experience in pollutant or discharge control research.
- Strong skills in analysis and evaluation, and experience in implementing environmental projects
- Ability to produce high quality reports and publications in English

Activity 4 of output 3.1.1 (REV)

Economic analysis of reduction of nutrients for better environment and ecosystem of pilot sites

TERMS OF REFERENCE

Environmental Economist to Assess Ecosystem Services of Wetland Projects

Consultancy classification: International consultants
Budget line: 71200, Activity 4 of Output 3.1.1, Component 3. Budget: USD18,000;
Estimated start of work: December 1, 2017 and complete on June 20, 2018.

Background and Justification

Based on the transboundary diagnostic analysis of the Yellow Sea, one of the major environmental problems is the enrichment of nutrients in the Yellow Sea which is the major cause of harmful algal blooms in the region. Water pollution in coastal areas has caused social and political attention because of its significant impacts on not only the environment, but

also the economy and society as well. More importantly, water pollution issue has been intertwined with other issues such as coastal wetland loss, marine ecosystem degradation and coastal land reclamation, eutrophication from aquaculture, etc. Therefore, more cost-effective, innovative and integrated approaches rather than traditional engineering methods are needed to tackle water pollution in coastal areas under high development pressures in this rapidly changing time.

Manmade wetlands or use of wetland for tertiary treatment of pollution have been recognized as effective ways to remove nutrients and other pollutants from land-based sources in YS region by the PR China, RO Korea and international financial institutions such as the World Bank. Studies indicate that the constructed wetland's efficiency in water pollutants is reliable, particularly for nutrients removal with a very low wastewater background concentration, meaning it is suitable for the non-point source pollution.

In the mission of the Project Management Office of the YSLME Phase II Project, Darushan of Shandong Province was identified as the site for demonstration in the following areas: 1) economic analysis of the impact and benefits of restoration projects as a way to promote continued comprehensive approaches and investment to restore the coastal and estuarine ecosystems; 2) conduct of total pollution loading in the bay area including from maricuture; and 3) support the application of IMTA to mariculture for improved productivity and reduced nutrients loading; and 4) design of new wetland restoration projects taking into account the good practices and experiences at home and abroad.

Since 2005, both public and private sector invested in coastal restoration, consolidation of mudflat, sand beaches and artificial wetland construction with a total investment of nearly $100 million. The restoration covers bay area of Darushankou from the north, and to Pudao Island to the south, with coordinates as 36°43'N~36°47'N and 121°28'E~121°34'E. In accordance with the Darushan National Ocean Park monitoring and assessment report in 2015, water quality of the park remains good, qualified for level 1, the sediments are classified as level 1; Phytoplankton species abound, biodiversity is rich with sound ecological structure. Yet the ecosystem services in monetary terms have not been assessed, nor have the benefits of continued restoration and adoption of sustainable mariculture been assessed. In the discussion with local government officials, Rushan Municipal Government will consider continued investment in restoration of the Darushan National Ocean Park which is now a four-start scenic spot attracting hundreds of thousands of visitors in summer each year. Potential sources of funding include the blue bay initiative managed by State Oceanic Administration of PR China.

This consultancy will cover two phases. The scoping phase will determine the scope of studies of economic analysis of project, while the assessment phase will entail the retrospective assessment of wetland restoration, coastal mudflat and artificial wetland development projects and prospective analysis of the projects proposed for funding by Blue Bay initiative. Demonstration of TPL, IMTA and design of new wetland restoration projects will be covered in other activities of the project in Outcome 3.1 and Outcome 3.2.

Objectives

The objective underlying the proposed consultancy is to catalyze investment in pollution reduction from land-based sources through wetland restoration and construction to improve the ecosystem health of the Yellow Sea.

Immediate Objectives

The objective underlying the proposed consultancy are:

- to conduct a scoping study for a subsequent subcontract; and
- to assess the social and economic impact and environmental benefits of existing pollution reduction from land-based sources and wetland restoration/construction projects in Darushan Bay area, and the economic potential of planned restoration and wetland construction projects for funding under Blue Bay Action Plan to help local government to make informed investment decision making;

Expected Outputs

The subcontractor is expected to deliver the following results:

- A scoping study report with recommendations on retrospective economic analysis of benefits of nutrient reduction and/or wetland construction or restoration projects since 2005 and a prospective economic analysis of planned projects for wetland restoration, pollution reduction from land-based sources and from aquaculture in Rushan Bay, Shandong Province.
- A retrospective economic analysis report of benefits of nutrient reduction and/or wetland construction or restoration projects since 2005; and
- A prospective economic analysis report of planned wetland restoration and pollution reduction projects in Rushan Bay, Shandong Province.

Activities

Under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team, the subcontractor will conduct the following activities in two phases.

Scoping studies phase:

- To design a time-bound and budgeted workplan in consultation with YSLME Phase II Project PMO and Rushan Municipal Government for the scoping study;
- To collect second-hand data, map, previous survey results of estuarine biodiversity of the Rushan Ocean Park, evaluation reports of restoration projects, and development plan and projects in the project areas to be funded by Blue Bay Initiative and other sources;
- To conduct a 3-5 day field trip to the project site and meet with stakeholders for information collection and discuss assessment scope;
- To prepare an inception report with details of assessment scope, projects covered, methodologies, parameters and data sources, workplan to support access to funding for investment, information needed to support the assessment from Rushan City or other parties related with the assessment;

Assessment phase

- To conduct cost-benefit analysis of wetland ecosystem restoration projects since 2005, including ecosystem services from restoration projects including provisioning, regulating, cultural and supporting services;
- To document good practices in restoration for replication and prepare practice note for dissemination;
- To analyze factors leading to, or potentially leading to the achievement of the project results, or failures of the project, including institutional, political, technical, capacity development and other factors;
- Conduct prospective assessment of ecological benefits of proposed restoration project for funding by Blue Bay Action Plan
- Provide illustration of impact and effects such as tables, graphs, pictures, etc

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will facilitate the access to information and reports of completed and proposed projects, and provide logistics support to field trip to project sites.

Timing

The consultancy will begin in 1 November, 2017 and complete on March 31, 2018.

Reporting

The subcontractor will produce:

1. by April 1, 2018, an inception report;
2. by June 20, 2018, draft scoping study report for review; and
3. by June 20, 2019, final report.

All reports should be submitted in English. Reports should be submitted to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org.

Activity 3 of Output 3.2.1

Technical support to design wetland habitats to achieve blue bay in three pilot sites in China and application of clean production technologies and relevant technology transfer

TERMS OF REFERENCE

Technical assistance in design artificial wetland for restoring coastal ecosystem services of Yellow Sea

Consultancy classification:	subcontract
Budget line:	72100, Activity 3 of Output 3.2.1, Component 3. Budget: USD180,000;
Estimated start of work:	May 2018 to June 30, 2019

Background and Justification

Water pollution in coastal areas has caused social and political attention because of its significant impacts on not only the environment, but also the economy and society as well. More importantly, water pollution issue has been intertwined with other issues such as coastal wetland loss, marine ecosystem degradation and coastal land reclamation, eutrophication from aquaculture, etc. Therefore, more cost-effective, innovative and integrated approaches rather than traditional engineering methods are needed to tackle water pollution in coastal areas under high development pressures in this rapidly changing time.

In recent days, the wise use of natural and artificial wetlands for water purification has become one of hot issues on its valuable and exploitable aspects for the protection of water quality in catchments, rivers, lakes and estuarine environments. According to recent findings of scientific research, there is a global and regional consensus that artificial (constructed) wetlands represent a low-cost technology that can reduce the nutrient discharge to marine environment.

Manmade wetlands or use of wetland for tertiary treatment of pollution have been recognized as effective ways to remove nutrients and other pollutants from land-based sources in YS region by the PR China, RO Korea and international financial institutions such as the World Bank. Studies indicate that the constructed wetland's efficiency in water pollutants is reliable, particularly for nutrients removal with a very low wastewater background concentration, meaning it is suitable for the non-point source pollution. Better still, they can be integrated into agricultural and fish production systems where the products are useable and/or re-cycled for optimal efficiency. However, currently, constructed wetlands are rarely installed because of lack of interests of countries and the need for in-house research, training and development.

Since no wetland can provide all ecosystem services indefinitely, it would be suggested to consider the designing wetland habitats that will best restore ecosystem services by applying clean production technologies. "Strategic" restoration and/or application to design wetland habitats would use an adaptive management approach, targeting three pilot sites with application of clean production technologies, and prioritizing the location, size, and type of wetland needed for a watershed to provide optimal levels of ecosystem services.

Objectives

The development objective underlying the proposed consultancy is reduction of pollution and enhancing ecosystem resilience in two pilot sites through design and implementation of artificial wetlands projects.

Immediate Objectives

Specific objectives of this task include:

- Proposals for wetland construction to two pilot sites in PR China

Expected Outputs

The subcontractor is expected to deliver the following results:

- Demonstration site profiling reports detailing the baselines of social, economic and environmental conditions
- Two technical proposals detailing the design of wetland habitats including information on siting, intended multiple benefits, construction, operation, maintenance and monitoring of constructed treatment wetlands

Activities

Under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team, the consultant will conduct the following activities.

Output 1: Demonstration site profiling reports detailing the baselines of social, economic and environmental conditions

- With assistance from National Coordinator in PR China and members of the IMCC, identify demonstration sites that have interests in restoring ecosystem health and services while increasing productivity from production sectors;
- Conduct social, economic and environmental profiling of identified demonstration sites;
- Working closely with consultants for Activity 3 of Output 3.2.1, identify the good practice and experiences of using wetland as nutrient sinks being implemented globally that are providing significant water quality benefits while demonstrating additional benefits such as wildlife habitat;

Output 2: Two technical proposals detailing the design of wetland habitats including information on siting, intended multiple benefits, construction, operation, maintenance and monitoring of constructed treatment wetlands

- Conduct social and economic assessment including gender sensitivity assessment of proposed projects, stakeholder consultations and make proposals for management responses to be considered in the project;
- Develop "Factsheet" explaining wetland habitats, performance and scientific knowledge of constructed wetlands to meet societal and ecological needs
- In collaboration with consultants for Activity 4 of Output 3 .1.1, prepare analytical report on cost-benefits, cost and effect and value of wetland services in restoring coastal and marine environment
- Finalize two technical proposals on design of wetland habitats including information on siting, intended benefits, feasibilities, construction, operation, maintenance and monitoring of constructed wetlands;

Inputs

UNDP/GEF YSLME Phase II Project Management Office (PMO) will provide the background information and documents, and will be responsible for providing logistics support to facilitate travel to project sites and meeting with relevant stakeholders, including access to information and date about the project sites.

Timing

The consultancy will begin in May, 2018 and end in June 3o, 2019.

Reporting

The subcontractor will produce reports within the following timelines:

1. By July 2018, submit the inception report;
2. By November 1, 2018, two site profiling reports;
3. By June 1, 2019, final proposals.

All reports should be submitted in English. Reports should be submitted to Mr. Yinfeng Guo, CTA/Manager at email: yinfengg@unops.org.

Activity 3 of Output 3.3.1 (REV)

Review technologies for waste reduction, reuse, recovery, and economic studies on recycling uses

TERMS OF REFERENCE

To review technologies for waste reduction, reuse, recovery, and economic studies on recycling uses

Consultancy classification:	Individual consultant
Budget line:	71200, Activity 3 of Output 3.3.1, Component 3. Budget: USD8,000;
Estimated start of work:	this activity is postponed for future review with possible option of using the budget for some other purposes identified as more relevant.

Background and Justification

Based on the transboundary diagnostic analysis of the Yellow Sea, one of the major environmental problems is the enrichment of nutrients in the Yellow Sea which is the major cause of harmful algal blooms in the region. Water pollution in coastal areas has caused social and political attention because of its significant impacts on not only the environment, but also the economy and society as well. More importantly, water pollution issue has been intertwined with other issues such as coastal wetland loss, marine ecosystem degradation and coastal land reclamation, eutrophication from aquaculture, etc. Therefore, more cost-effective, innovative and integrated approaches rather than traditional engineering methods are needed to tackle water pollution in coastal areas under high development pressures in this rapidly changing time.

Objectives

The objective underlying the proposed consultancy is to catalyze regional and national governance for waste reduction, reuse and waste recycling.

Expected Outputs

The consultant is expected to deliver the following results:

- A study report with recommendations and good practices on retrospective economic analysis of business developed from waste reduction, reuse and recycling
- An economic analysis report of benefits of using new technologies for waste reduction, reuse and waste recycling.

Activities

Under supervision of the Chief Technical Advisor and technical guidance of the RWG-P, in close collaboration with the local project team, the subcontractor will conduct the following activities.

- To review of good practices that can be applied across YSLME in particular in waste reduction, reuse, and waste recycling technologies;

- To assess the social and economic impact and environmental benefits of using existing recycling facilities in waste reduction, reuse and waste recycling.
- To develop economic studies and benefit scenario to help local government to make informed investment decision making in Blue Economy

Inputs

UNDP/GEF YSLME Phase II Project management Office (PMO) will facilitate the access to information and reports of completed and proposed projects, and provide logistics support to field trip to project sites.

Timing

The consultancy will begin in November 1, 2017 and end in December 31, 2018.

Reporting

The consultant will produce:

1. draft synthesis report including good practices and economic benefit scenario and case studies for review; and
2. final report and case studies.

Reports should be submitted to Mr. Yinfeng Guo, CTA/Manger at email: yinfengg@unops.org

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