Terminal Evaluation Report

UNDP-GEF Project: EAS: Implementation of the Yellow Sea LME Strategic Action Programme for Adaptive Ecosystem-Based Management

GEF Project ID: 4343 UNDP Project ID: 4552

Countries:	People's Republic of China (with Republic of Korea fully self-financing)
Region:	Asia and the Pacific
Focal Area:	International Waters (GEF-5)
GEF Agency:	United Nations Development Programme (UNDP)
Executing Agency:	United Nations Office for Project Services (UNOPS)

Project focus area within the Yellow Sea Large Marine Ecosystem (extracted from project document)

Date	Version	
09 Oct 2020	01	First draft

Opening Page

PROJECT DETAILS:	
Project Name:	EAS: Implementation of the Yellow Sea LME Strategic Action Programme for Adaptive Ecosystem-Based Management
Project ID:	GEF Project ID: 4343 UNDP PIMS ID: 4552
Country:	China (with Republic of Korea fully self-financing)
Region:	Asia and the Pacific
Focal Area:	International Waters
Funding Source:	GEF Trust Fund (GEF-5 replenishment cycle)
GEF Focal Area Objective:	Objective 2 (IW-2): Catalyze multistate cooperation to rebuild marine fisheries and reduce pollution of coasts and Large Marine Ecosystems (LMEs) while considering climatic variability and change
Implementing Agency:	United Nations Development Programme (UNDP)
Implementation Modality:	Agency Execution
Executing Agency:	United Nations Office for Project Services (UNOPS)
Responsible Partners:	N/A
FINANCIALS:	
Project Preparation Grant:	USD 0
GEF Project Grant:	USD 7,562,430
Cofinancing Total:	USD 225,481,766
GEF Agency Fees:	USD 680,619
Total Cost:	USD 233,044,196
PROJECT TIMELINE:	
Received by GEF:	09 September 2010
Concept Approved:	01 April 2013
Project Approved for Implementation:	24 February 2014
Start Date:	11 July 2014
Project Closed (revised):	31 December 2020
TERMINAL EVALUATION DETAILS:	
TE Timeframe:	August-October 2020
TE Team	James Lenoci, International Consultant / Team Leader Dr. Liu Shuo, National Consultant
Reporting Language:	English

The terminal evaluation (TE) team would like to acknowledge the informative feedback and logistical support provided by the project stakeholders, including government officials, project implementation stakeholders, project partners, project beneficiaries, , the UNDP CO staff, the UNDP Regional Technical Advisor, UNOPS staff, and the Project Manager and project team members.

Executive Summary

The International Waters focal area project was approved under the GEF-5 replenishment cycle through an agency implementation modality, supported by the UNDP as the GEF implementing agency and UNOPS as the executing agency. Basic project information and finances are summarized below in **Table 1**.

***Table 1**: Project information table*

Project title:	**EAS: Implementation of the Yellow Sea LME Strategic Action Programme for Adaptive Ecosystem-Based Management**		
Project Details:		**Project Milestones:**	
UNDP Project ID (PIMS #):	4552	**PIF Approval Date:**	01 Apr 2013
GEF Project ID:	4343	**CEO Endorsement Date:**	24 Feb 2014
UNDP Atlas Business Unit, Award ID, Project ID:	Atlas ID: 74724 Project ID: 87001	**ProDoc Signature Date:**	11 Jul 2014
Country/Countries:	China (with Republic of Korea fully self-financing)	**Date Project Manager hired:**	2015 (first PM) Nov 2016 (second PM)
Region:	Asia and the Pacific	**Inception Workshop date**	13 Jul 2017
Focal Area:	International Waters	**Midterm Review Completion date:**	Mar 2018
GEF Operational Programme or Strategic Priorities/Objectives	GEF-5 International Waters, Objective 2	**Terminal Evaluation Completion date:**	Oct 2020
		Revised Operational Closure date	31 Dec 2020
Trust Fund:	GEF Trust Fund		
Implementing Partner (GEF Executing Entity):	United Nations Office for Project Services (UNOPS)		
NGOs/CBOs involvement:	Recipients of small grants; members of the Yellow Sea Partnership.		
Private sector involvement:	Engaged in demonstration activities.		
Geospatial coordinates of project sites:	35.00 N, 123.00 E		
Financial Information:			
PPG:	**at approval (USD)**	**at PPG completion (USD)**	
GEF grant for preparation:	0	0	
Co-financing for preparation:	0	0	
Project:	**at CEO Endorsement (USD)**	**at TE (USD)**	
[1] UNDP contribution:	1,692,000	1,692,000*	
[2] Government:	92,655,060	192,709,103	
[3] Other multi-/bi-laterals:	129,334,706	6,891,327,224*	
[4] Private sector:	0	0	
[5] NGOs:	1,800,000	128,085*	
[6] Total co-financing [1 + 2 + 3 + 4 + 5]:	**225,481,766**	**7,085,856,412***	
[7] Total GEF funding:	7,562,430	6,951,427***	
[8] Total project funding [6 + 7]:	**233,044,196**	**7,092,807,839***	

Notes: *To be confirmed. **Co-financing reported by the Republic of Korea Ministry of Oceans and Fisheries covers funding expended over the period of 2014-2020 for the coastal and marine initiatives across the country, not only the YSLME area. *** Total GEF funding based upon figures through 30 June 2020.

TERMINAL EVALUATION PURPOSE

The TE has the following complementary purposes:

- To promote accountability and transparency.
- To synthesize lessons that can help to improve the selection, design, and implementation of future UNDP-supported GEF-financed initiatives; and to improve the sustainability of benefits and aid in overall enhancement of UNDP programming.

- To assess and document project results, and the contribution of these results towards achieving GEF strategic objectives aimed at global environmental benefits.
- To gauge the extent of project convergence with other development priorities, including poverty alleviation, strengthening resilience to the impacts of climate change, reducing disaster risk and vulnerability, as well as cross-cutting issues such as gender equipment, women's empowerment, and supporting human rights.

METHODOLOGY

The TE was an evidence-based assessment, relying on feedback from individuals who have been involved in the design, implementation, and supervision of the project, review of available documents, and findings of online stakeholder surveys. The overall approach and methodology of the evaluation followed GEF and UNDP.

The timing of the TE coincided with the COVID-19 pandemic. As of 11 March 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic as the new coronavirus rapidly spread to all regions of the world. International travel to China and South Korea was restricted during this timeframe. As an adaptive management measure, stakeholder interviews were made on virtual platforms and an online survey was conducted to obtain direct feedback from YSLME fishers. Domestic travel restrictions were lifted during the timeframe of the TE and, hence, the national TE consultant carried out a field mission in September 2020 to project demonstration sites in Shandong Province.

PROJECT DESCRIPTION

The project was designed to build upon the regional cooperation for the sustainable use of the Yellow Sea Large Marine Ecosystem (YSLME) put in place by People's Republic of China (China) and the Republic of Korea (South Korea), supported by the Democratic People's Republic of Korea (North Korea), the Yellow Sea Partnership, and the Global Environment Facility (GEF). The initial project (Phase I), implemented over the period of 2004-2011, completed a regional Transboundary Diagnostic Analysis (TDA) and finalized a regional Strategic Action Programme (SAP) for the period of 2009-2020.

The project objective was to foster long-term sustainable institutional, policy, and financial arrangements for effective ecosystem-based management of the YSLME. To achieve this objective, the project strategy included supporting the formation of an YSLME Commission that will oversee the implementation of the SAP, and supporting the littoral states' efforts to reduce the decline in biological resources and to restore depleted fish stocks in this large marine ecosystem.

PROJECT THEORY OF CHANGE

For the purposes of contextualizing and orienting the TE, the TE team constructed a generalized theory of change for the project (see **Figure 1**) based upon the project strategy, the causal chain analysis included in the 2020 TDA, and the draft updated SAP (2020-2030).

The threats facing the YSLME are multiple and complex. As a result of years of overfishing of commercially valuable species and uncontrolled pollution, both from point and non-point sources, there has been changes in biomass and species composition. This has been exacerbated regional climate change impacts, including increasing sea surface temperatures and acidification. The expansion of mariculture and a lack of consistent management practices influencing the nutrient cycle and the increased eutrophication and contributing towards harmful algal blooms (HABs) and jellyfish blooms. Land-based sources of pollution are also significant stressors to the coastal and marine ecosystems. Significant economic development in China and South Korea in the past 20-30 years has been accompanied with increases of industrial emissions, discharges of sewage, runoff from agricultural lands where fertilizer use has intensified, and inadequate solid waste management, particularly related to plastics. Three of the emerging issues identified in the 2020 TDA include air pollution (particulate matter PM10 and PM2.5) from emissions from industry, marine plastics, and contaminants of emerging concern. Loss of habitat and modification of coastal ecosystems through reclamation and other development activities have resulted in biodiversity loss and reduced resilience to withstand disasters and the impacts of climate change.

The design of the Phase II project addressed the barriers hindering adoption of a regional, ecosystem-based approach towards the sustainable management of the YSLME and was directly aligned with the priorities outlined in the 2009-2020 SAP. Component 1 addressed the need for strengthening regional cooperation and enhancing inter-sectoral coordination to tackle the multi-faceted ecosystem threats. Building upon the momentum gained during Phase I, GEF resources were allocated to advance the process of forming a durable regional governance mechanism and strengthen and expand stakeholder involvement. The focus of Component 2 was on improving ecosystem carrying capacity with respect to provisioning services, specifically fisheries. The GEF alternative was rooted in the importance of adopting an ecosystem-based approach to fisheries and the recognition that recovering and sustaining fish stocks requires a joint,

regional strategy. Promoting sustainable mariculture practices is an integral part of the strategy, as the vast reach of mariculture installations have prompted regional level concerns. Addressing land-based pollution was the aim of the interventions delivered under Component 3, with funds allocated to disseminate innovation into ecological engineering approaches such as constructed wetlands, raise community awareness on marine litter, and enhance regional coordination on reducing and controlling microplastics. Component 4 focused on regional cooperation regarding biodiversity conservation and addressing vulnerability to climate change, including strengthened connectivity of marine protected areas (MPAs) in the YSLME, expanding involvement of the civil society, and enhancing joint monitoring and sharing of information.

GEF funding is meant to be catalytic, feeding into national initiatives, strengthening regional cooperation towards safeguarding and generating global environmental benefits in the YSLME. Achieving sustainable management of the YSLME will require time and there are a number of assumptions and impact drivers that influence further progress towards longer term outcomes, e.g., as outlined in the updated SAP (2020-2030) and eventual, systemic change and impact. An important assumption is that political and financial commitments for regional cooperation are durable and that national policies continue to be consistent with priorities of the YSLME. The project theory of change also includes an assumption that there is sufficient stakeholder buy-in for applying an ecosystem-based approach to fisheries on a regional scale, and the parties support joint surveys and share information to facilitate that process. Achieving certification of fisheries will partly be driven by consumer demand and willingness to pay for sustainable production, and it is important that sustainable options are attractive to fishers and mariculture operators. There needs to be appropriate regulatory and incentive frameworks in place to ensure broader uptake of best management practices. Continued increase in public awareness will also drive demands on controlling pollution and ensuring conservation objectives are fulfilled. The exchange of information is critical in facilitating improvements across the YSLME, e.g., adaptive management measures depend on feedback from regional monitoring efforts. With respect to biodiversity conservation, multi-stakeholder endorsement of regional strategies will facilitate progress, i.e., apart from governmental stakeholders, the civil society and private sector have important roles in terms of community engagement, introducing innovation, and sustainable financing. Strengthening resilience of coastal ecosystems and communities will likely continue at the local level, e.g., through further adoption of integrated coastal zone management (ICM). Through regional cooperation approaches, such as clustering, these local efforts can lead ecosystem scale management, supported by joint early warning systems and other collaborative mechanisms.

GLOBAL ENVIRONMENTAL BENEFITS GENERATED

The following global environmental benefits have been generated through the Phase II YSLME project:

Substantive progress towards regional agreement and collaborative management to support SAP implementation

Facilitated by Interim Commission Council (ICC) and six Regional Working Groups, there has been substantive progress towards reaching a clearer understanding on a regional governance mechanism for the YSLME. At the time of the, government officials from China and South Korea were discussing the details of a memorandum of understanding (MOU) that confirms their commitment towards regional governance and sets out the next steps for operationalizing an agreed collaborative arrangement.

Advanced level of transboundary diagnostic analysis and strategic action program formulation and implementation

The project funded an updated TDA, with the report issued in June 2020, and a new SAP covering the period of 2020-2030 has been drafted and was being socialized at the time of the TE in September 2020. The analyses undertaken as part of the updated TDA provided an opportunity to revisit the concerns addressed in the TDA completed during the Phase I project and to consider emerging issues, including air pollution, marine plastics, and contaminants of emerging concern.

The two countries have made significant investments in line with the ecosystem-based management priorities outlined in the 2009-2020 SAP, including monitoring, surveillance, and control of fisheries operations, buy-back of fishing vessels, improving mariculture operations, expanded monitoring of point source and non-point sources of pollution, development and operation of environmental information systems, collection and control of marine debris, upgrades and expanded wastewater collection and treatment, restoration of degraded coastal ecosystems, management of MPAs, marine surveys, public awareness campaigns, etc.

SUMMARY OF CONCLUSIONS

Following a highly successful Phase I project that closed in 2011, the Phase II project was developed to support the implementation of the 2009-2020 YSLME Strategic Action Program (SAP). The Phase II project obtained endorsement from the GEF CEO in February 2014 and was approved by the Government of China in July of that year, the official start

date of the 4-year duration project. Project implementation was significantly delayed, with the project inception workshop held in July 2017, three years after the official July 2014 start date. Two, no-cost time extensions were granted, shifting the closure date to 30 December 2020. As of 30 June 2020, USD 6.95 million of the USD 7.56 million GEF project grant had been expended

GEF Additionality

China and South Korea have made substantial investments in coastal and marine environment improvements in the YSLME over the past 10 years. GEF additionality included facilitating regional dialogue and formulating options for durable regional cooperation and financing arrangements; exchanging knowledge and lessons among the scientific communities; providing added value to innovative approaches and technologies, such as integrated multi-trophic aquaculture, ecological engineering approaches like constructed wetlands; providing small grants to civil society organizations and research institutions for promoting best practice management and raising community awareness; delivering technical assistance in analyzing current and emerging threats, updating the transboundary diagnostic analysis (TDA) and developing an updated regional SAP for the period of 2020-2030.

Project Design/Formulation

The project design as aligned to the priorities agreed to in the 2009-2020 SAP, with a focus on facilitating further progress towards establishment of a regional governance mechanism in Component 2, reducing pressures on fisheries in Component 2, addressing the threats associated with pollution in Component 3, and strengthening the conservation of critical coastal and marine habitats in Component 4.

The broad scope of the project presented implementation challenges. The number of planned activities was somewhat reduced in response to one of the midterm review recommendations, but the overall strategy remained extensive, with the GEF resources spread fairly thin across the thematic subject areas. Moreover, the project activities under Components 2 and 3 were primarily centered in China. This is somewhat understandable, as South Korea is not a GEF beneficiary country, but as an international waters project, the strategy could have better emphasized issues and activities that promote regional cooperation. The two countries are independently making substantial investments on domestic improvements.

There were a few monitoring and evaluation shortcomings in the project design, including some baseline conditions not being validated, unclear baseline and end targets, and not specifically describing the means of verification for some of the metrics in the project results framework.

With respect to the management arrangements aspects of the project design, combining the functions of Chief Technical Advisor and Project Manager into one position was an under-estimation of the required workload for this complex project, requiring extensive stakeholder engagement and guidance on a wide variety of thematic subjects.

Adaptive Management

As part of the agreement to grant two separate, no-cost time extensions for the project, an updated TDA and SAP were completed. These were significant and timely achievements, as the first phase of the SAP (2009-2020) extended to the last year of the project, thus the updated SAP, covering the period of 2020-2030 provides well-timed support to the MOU under negotiation on regional governance.

The current Project Management Office (PMO) team did a good job at making up time lost as a result of the delay in initiating the project implementation. Timely adjustments were made in response to the midterm review recommendations, including reducing the number of overall activities and shifting more funding into the small grants mechanism on the project, allowing broader participation of the civil society sector. More frequent project meetings were held between UNDP and UNOPS to increase delivery of project outputs, and the MNR assigned a senior official to serve as team leader in coordinating the update of the TDA and SAP. Project resources were also reallocated to shore up the PMO team, including hiring of interns.

The decision to use partner cooperation agreements (PCAs) in lieu of contracts with multiple organizations and individuals was a constructive adaptive management measure. The cumulative value of the four PCAs executed with the Yellow Sea Fisheries Research Institute (YSFRI), the First Institute of Oceanography (FIO), the National Marine Environmental Monitoring Center (NMEMC), and the North China Sea Environmental Monitoring Center (NCSEMC) was approx. USD 2 million, which is a bit more than 25% of the USD 7.56 million GEF project grant.

The constraints imposed in response to the COVID-19 pandemic starting in early 2020 presented significant disruptions to the implementation strategy for the remainder of this final year of the project. Adaptive management measures were implemented, including convening virtual meetings and trainings, but restrictions on organizing gatherings of

people have impacted the effectiveness of stakeholder engagement and discussions on regional cooperation arrangements.

Country Ownership

Both countries have allocated substantial funds towards achieving ecosystem improvements in the YSLME, consistent with the priorities agreed upon in the 2009-2020 SAP. Co-financing from the two national governments considerably exceed the figures confirmed at project entry. Moreover, the project preparation costs were fully funded through co-financing contributions; GEF resources were not utilized for the development of the project design.

Major institutional restructuring in China coincided with the project lifespan - this presented challenges to the implementation but also strengthened stakeholder influence in the long-term. The State Oceanic Administration (SOA), formerly a stand-alone institution was merged into the newly established Ministry of Natural Resources (MNR). The restructuring has consolidated many marine related functions under the MNR and has elevated the Chinese focal point for the YSLME project to a ministerial level. Cross-sectoral collaboration remains a priority, considering that fisheries fall under the mandate of the Ministry of Agriculture and Rural Affairs (MARA) and the Ministry of Ecology and Environment (MEE) is responsible for pollution related issues and is the focal agency to the UN Convention on Biological Diversity (CBD), UN Framework Convention on Climate Change (UNFCCC), and other multilateral environmental agreements.

Although a formal regional governance mechanism has not yet been established, the two parties have continued to engage in constructive dialogue through the Interim ~~Coordinating~~ Commission Council (ICC) and separate bilateral channels. A clear message communicated during the TE interviews was that a regional governance arrangement is needed for the YSLME. There are bilateral agreements, such as the 2001 fisheries agreement and various technical cooperation arrangements, and China and South Korea are active members on regional platforms, such as Sustainable Development Strategy for the Seas of East Asia (SDS-SEA), North-East Asian Marine Protected Areas Network (NEAMPAN), NOWPAP, etc. But there is an overwhelmingly consistent view among YSLME stakeholders supporting the need for a regional governance mechanism to address ecosystem-wide issues. This is testament to the relevance of the project.

Country ownership was somewhat diminished as a result of how the activities under Components 2 and 3 were mostly carried out in China, rather than focusing more on regional issues. This resulted in a slight reluctance among some of the Korean stakeholders to engage on the project.

Actual Stakeholder Participation and Partnership Arrangements

Regional stakeholder engagement was further strengthened during Phase II, facilitated by the six regional working groups (RWGs): RWG-F: Fisheries; RWG-M: Mariculture; RWG-H: Habitats; RWG-P: Pollution; RWG-A: Assessment; RWG-G: Sustainability (Finance and Governance). The counterpart national working groups (NWGs) provided platforms for enhancing stakeholder collaboration at the domestic level.

Over the approximate 3-year period from July 2017 until May 2020, the project has organized 57 stakeholder events, including meetings, workshops, seminars, trainings, etc., with a reported cumulative total of 1,845 people participating, of whom 30% were women.

The key stakeholders involved on the project largely carried over from those participating during Phase I. Consistent with the GEF International Waters (IW) focal area strategic approach, Phase I projects typically have a strong engagement with the scientific community, leading the collaborative transboundary diagnostic analysis (TDA) process. The focus of Phase II was on implementation of the priority actions in the SAP – often requiring an expanded set of stakeholders. Actual stakeholder engagement had shortcomings in capturing this need for broader stakeholder involvement, including for example including MARA, MEE, and provincial authorities in China, and subnational authorities and development agencies in South Korea.

Through the small-grants mechanism, the project facilitated meaningful engagement among local Chinese NGOs and research institutions. A total of seven (7) grants were awarded, ranging in value from USD 39,778 to USD 100,000, with a cumulative value of USD 478,767. Some of the activities implemented through these grants were focused in strengthening regional collaboration among civil society organizations. It would have been advisable to have also offered the opportunity to Korean NGOs to participate in the call for proposals.

The project has also engaged the private sector, particularly regarding mariculture. GEF funds allocated to support the analysis of the performance and environmental conditions of integrated multi-trophic aquaculture (IMTA), partnerships were established with individual enterprises and business associations. Such partnerships are important for securing multi-stakeholder buy-in for sustainable production practices.

The project endeavored to strengthen the Yellow Sea Partnership (YSP), an alliance established during the Phase I project and consisting of international and domestic NGOs, complementary regional programmes, such as the UNDP Regional Seas Programme, particularly the Northwest Pacific Action Plan (NOWPAP), and national institutions. Members of the YSP participated in many of the project meetings and events, and project progress reports indicate that guidelines were developed and that the PMO acted as the secretariat. The 2018 Communications and Awareness Raising Strategy for the project does not mention the role of the YSP. The sustainability of the YSP is questionable following project closure.

Risk Management

Twelve (12) risks were identified in the project design and assessed for probability of occurrence and potential impact to implementation. The project did a good job at reporting on risk management (e.g., in the annual project implementation reports – PIRs), indicating mitigation measures proposed and implemented, and identifying and acting upon new risks.

The 2017 PIR mentions mitigation measures considered for engagement of North Korea, e.g., through utilizing diplomatic channels with China. The report also includes discussion on the risk of negotiating joint fisheries stock assessments. This was followed up in the 2018 PIR, explaining that the PMO had identified swimming crab and small yellow croaker as target species for facilitating discussions on joint stock assessment.

The risk of partners being unwilling to make formal commitments was highlighted in the 2018 PIR, and recommended mitigation measures included a planned exchange visit to the Helsinki Commission, the governing body of the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM Convention). The risk was revisited in the 2019 PIR, which discusses the movement towards the concept of a flexible, innovative governance mechanism, in lieu of a formal commission.

The risk management section of the 2019 PIR also pointed out the risk of ensuring ownership of the newly established Ministry of Natural Resources (MNR) in China. The description of mitigation measures to this risk mentions that the MNR had agreed to formally establish the Inter-Ministerial Coordination Committee (IMCC) to facilitate cross-sectoral and inter-sectoral cooperation. Moreover, the report states that ministry officials informed the project team that the IMCC would meet quarterly instead of annually to ensure sufficient attention was placed on the YSLME project.

The critical risks associated with the COVID-19 pandemic were discussed in the 2020 PIR. The impacts to the negotiations and eventual institutionalization of the regional governance mechanism and the updated SAP were described, as convening physical stakeholder gatherings were constrained.

Gender and other Cross-Cutting Issues

Limited resources were allocated for integrating gender equality and human rights. The project did a good job tracking participation of women, but there no specific strategies, e.g., gender action plan, and a limited scope social and environmental risk screening on the project was made at the project preparation phase. The available version of the social and environmental risk screening (Annex 5 to the project document) was undated and not signed. For Question No. 3 in the screening (Does the proposed project include activities and outputs that support upstream planning processes that potentially pose environmental and social impacts or are vulnerable to environmental and social change), the response was “No”. The response to potential upstream impacts should have been “Yes”, and social and environmental safeguards should have been more elaborated in the project design.

There were some community development related activities, such as assessing the socioeconomic impacts of the fishing vessel buy-back program in China, delivering training to displaced fishers, and on raising public awareness regarding marine debris and coastal zone management. And the project made substantive contributions towards strengthened knowledge and assessment tools regarding the vulnerability of coastal areas in China to climate hazards.

Cross-cutting issues are incorporated into the draft, updated SAP, including Target 3 (Build social safeguards into development of sustainable food supply), Target 5 (Reduce exposure to pathogens and toxics in the marine environment), Target 7 (Assess and adapt to long term changes in the marine ecosystem), and Target 9 (Prevent and reduce marine disasters). Moreover, Section 4.1 of the draft SAP under the “Enabling Conditions for the YSLME SAP” chapter is on mainstreaming gender in management actions.

Catalytic/Replication Effect

Knowledge transfer on the project was facilitated on several fronts, particularly through the interactions on the regional and national working groups, capacity building activities, exchange visits, seminars, and production and dissemination of knowledge products, training modules, and communication posts.

The project has produced a number of high quality knowledge products, including several well-made videos on some of the primary thematic areas of the project, e.g., "Saving the critically-endangered spoon-billed sandpiper" (released in May 2020 on Biodiversity Day), "Restoring the ecosystem carrying capacity and enabling the return of fish species in the Yellow Sea" (released in June 2020 on World Oceans Day), "Sealing a new ecological contract with the Yellow Sea through IMTA: the story of Dongchu Island" (released in June 2020 on World Oceans Day), "Cracking down on the tiny but dangerous microplastics: Responding to challenges of marine litter" (released in June 2020 on World Oceans Day), "Saving the remaining intertidal mudflats in the Yellow Sea for the critically-endangered spoon-billed sandpiper" (released in June 2020 on World Oceans Day), "Developing a network of marine protected areas in the Yellow Sea (released in June 2020), and "Restoring the ecosystem carrying capacity of the Yellow Sea" (project video).

An extensive amount of information was uploaded to the project website, which was regularly maintained. The project also had an extensive footprint on social media, including Facebook, Instagram, Twitter, and WeChat Information has also been shared through the IW:Learn, which is the GEF International Waters focal area knowledge management platform, and the TE team was informed that most of the content from the project website will be migrated to IW:Learn.

Exchange visits involving scientific experts were important in terms of transfer of knowledge and influencing the catalytic effect of the project. For example, sharing information on the use of biodegradable fishing gear in South Korea was of interest among the Chinese counterparts, and exchanging approaches used for jellyfish monitoring helped to harmonize the methodologies used in the two countries. Operators in China have considerably more experience in commercial scale implementation of IMTA, and Korean experts shared their research findings on productivity, nutrient dynamics, and disease transfer between organisms.

Another example of a catalytic effect was the construction of a training center by the by Dongchu Island Fishery Cooperation. The center has a 120 m^2 meeting room for training on IMTA techniques. Three training courses for Chinese mariculture managers and academia were conducted in 2018-2019.

A twinning exchange between the YSLME project and the Caribbean Regional Fishery Mechanism (CRFM) was facilitated by IW:Learn and IOC/UNESCO to share knowledge on IMTA technology with three Caribbean countries. Project partners hosted the Executive Director of CRFM and a senior government official from Jamaica on a week-long visit, as part of CRFM's efforts to advocate IMTA as a sustainable production approach in line with the blue economy strategies in the region.

There are a number of items requiring follow-up action after project closure. Sustained engagement of high level officials is needed to facilitate agreement to the MOU under discussion and the updated SAP. Several draft strategies, guidelines, and protocols have not yet been approved or widely socialized among relevant stakeholders. A few examples of such strategies and plans include the following: Regional Guidelines for Responsible Fisheries in the YSLME, Framework Plan for the YSLME Biodiversity Conservation in the Republic of Korea (2018-2030), YSLME Biodiversity Conservation Plan (2018-2030), MPA Network Development Training Toolkit, Regional Jellyfish Monitoring Program, Comprehensive Monitoring System for YSLME.

The project has not yet developed an exit strategy or sustainability plan for ensuring the outstanding issues are tended to after project closure. The 2018 Communication & Awareness Raising Strategy for the project mentions the concept of identifying individual or organizational level Yellow Sea champions/ambassadors, but there is no evidence that such champions/ambassadors have been designated.

Progress to Impact

As described in the 2011 TE of the Phase I project and mentioned in the design of Phase II, a non-legally binding governance mechanism was considered the most likely arrangement for some time. As Phase II nears project closure, there has been accelerated progress with respect to negotiating the terms of a memorandum of understanding that would reaffirm the two countries commitment and provide further direction on the agreed next steps. One option being discussed is to build upon the technical cooperation agreement between FIO and KIOST, possibly assigning secretariat functions to the jointly funded office in Qingdao. This approach is sensible, i.e., the scientific community has a strong track record of cooperation and incremental involvement of sectors could be achieved over time.

Problems associated with overfishing, i.e., fishing effort exceeding ecosystem carrying capacity, was one of the primary issues identified in the TDA completed during the Phase I YSLME project and prominently highlighted in the 2009-2020 SAP. The Phase II project strategy included activities supporting the countries' efforts at reducing pressures on YSLME fisheries, as well as addressing adverse impacts of mariculture on ecosystem health. One of the common management measures between the two countries is a reduction in the number of fishing vessels, through buyback programs and other economic displacement schemes. Significant numbers of vessels have been taken out of the capture fisheries sector. A high proportion of the reductions occurred among small-scale fishers, particularly in China. The importance of small-scale fishers on capture fisheries is substantial, not only in terms of production volumes but also because they

are often exempt from regulatory regimes and because the livelihoods and safety of the fishers are regularly in danger, as their economic outputs are often insufficient for investing in better equipment and knowledge.

Fishing pressure has also been reduced by displacing larger vessels to more offshore waters where fishing is controlled through fishery agreements, whereas fisheries in coastal waters are managed by seasonal closures and other management measures. The 2001 Fisheries Agreement between South Korea and China is an important bilateral cooperation mechanism, with a Joint Fisheries Committee deciding upon conditions for fisheries in the Provisional Measures Zone (PMZ). Representatives from the Joint Fisheries Committee did not participate on the project. (lesson learned)

Apart from reduction in fishing vessels, other management measures and habitat enhancement initiatives are being implemented in the two countries. South Korea continues to expand the application of Total Allowable Catch (TAC) approaches, with 18 species under TAC systems by the end of 2017. TAC implementation has been gaining traction in China in recent years for some species, with 5 currently under implementation. Seasonal closure of fishing grounds is a management measure widely applied across the region. Evidence of environmental status change has been reported in China, trophic levels (TL) of dominant capture fishery species in 1998-2000 were 3.46-3.48, whereas the TL of dominant species in 2014-2015 were 3.73-3.84.

Restrictions on further land reclamation instituted in both countries in recent years has been a major achievement in terms of reducing environmental stress across the coastal areas of the YSLME. Restoration of coastal ecosystems, expansion of protected areas, and increased awareness among local communities have facilitated environmental status changes, e.g., increased populations of endangered species, including the spoon spoon-billed sandpiper (*Calidris pygmaea*, IUCN Red List Critically Endangered). Coastal zones also provide protection against storm surges and other expected impacts of climate change, as recognized through the expanded adoption of integrated coastal management in the two countries.

Pollution and climate change related issues remain significant concerns. In fact, three of the emerging issues identified in the 2020 TDA are associated with pollution, i.e., air pollution from industrial emissions, marine plastics attributed to the overuse of plastics and inadequate control of marine litter, and contaminants of emerging concern that are related to sewage discharge. The findings of the TDA also point out worsening trends associated with changes in biomass and species composition, driven by pollution and regional climate change (warming, decreased pH levels). And the challenge of microplastics is increasingly recognized as a significant issue, affecting all tropic levels in marine ecosystems.

Extensive macroalgae blooms have occurred in the Yellow Sea over the past 20 years, influenced by multiple stressors, including land-based pollution discharges, climate change (e.g., warming sea surface temperatures), and expanded mariculture operations, including seaweed cultivation. Results of a remote sensing study[1] published in 2020 report that there was a 50% increase in chlorophyll concentrations in the Yellow Sea from the 1990s until 2011, followed by a 34% decrease to 2019. There is general consensus that more needs to be done in terms of pollution reduction, adopting sustainable management practices of mariculture installations, and gaining a better understanding of ecosystem dynamics in the Yellow Sea to control macroalgal blooms and other threats to ecosystem health.

EVALUATION RATINGS

Evaluation ratings are summarized below in **Table 2**.

***Table 2**: Evaluation ratings*

Criteria	Rating	Comments
1. Monitoring and Evaluation (M&E)		
M&E design at entry	**Moderately Satisfactory**	The M&E plan was developed using the standard UNDP template for GEF-financed projects. The indicative M&E budget was USD 197,000, or 2.6% of the USD 7,562,430 GEF project grant – this is roughly aligned with the current (July 2020) UNDP guidance, which stipulates 3% when the GEF project grant is between USD 5-10 million. A rating of moderately satisfactory is applied because some of the baseline conditions, end targets, and means of verification of the project metrics were not fully articulated.

[1] Sidman, G, S. Fuhrig, and G. Batra. 2020. The use of remote sensing analysis for evaluating the impact of development projects in the Yellow Sea Large Marine Ecosystem. Sustainability 2020, 12, 3628.

Criteria	Rating	Comments
M&E plan implementation	**Satisfactory**	The project has consistently produced quality and timely progress reports, having internal ratings consistent with independent evaluation findings and project risks highlighted. Some of the baselines, indicators, and end targets in the project results framework were not clarified during project implementation. Substantive adjustments were made in response to the midterm review recommendations.
Overall quality of M&E	**Satisfactory**	Overall, the quality of M&E on the project is rated as satisfactory. The project board (the ICC) was an important platform for M&E, providing strategic feedback to issues raised through project reporting. A significant level of adaptive management was required during the second half of the project, to make up lost time and deliver financially and strategically. The project results framework was not fully reviewed at the inception phase and uncertainties remained throughout implementation.
2. Implementing Agency (IA) Implementation & Executing Agency (EA) Execution		
Quality of UNDP Implementation / Oversight	**Satisfactory**	The UNDP CO has provided consistent administrative and strategic guidance throughout the project development and implementation phase, and played an important role in mediating discussions on recommended changes to the project strategy with Chinese and Korean government officials in 2015, and facilitating an eventual resolution. Project inception, however, occurred in July 2017, three years following the official start date of the project in July 214. The UNDP regional technical advisor (RTA) has been actively involved, providing strategic guidance to the project team and sharing best practices and lessons learned from overseeing international waters projects throughout Asia and the Pacific.
Quality of Implementing Partner Execution	**Satisfactory**	The current project management office (PMO) team, assembled since March 2017, has been able make up considerable ground after the first PMO team was replaced. There were missteps associated with the recruitment of the first PMO team, but the delay in starting implementation was also due to political issues that were beyond the control of the implementing partner. The decision to consolidate many of the technical activities under three partner cooperation agreements (PCAs) was an effective adaptive management measure that saved considerable time. Having different accounting systems from UNDP creates some challenges in reconciling expenditures.
Overall quality of Implementation / Execution	**Satisfactory**	The delay in initiating the project reduced overall effectiveness and likelihood that results will be sustained. There have been upsides to the extended project duration, e.g., completion of the updated TDA and preparation of the 2020-2030 SAP, as well as navigating through the institutional restructurings in China that started in 2018. Overall, the quality of implementation and execution is rated as satisfactory, particularly during the second half of the project.
3. Assessment of Outcomes		
Relevance	**Highly Satisfactory**	The project is highly relevant nationally and regionally. Firstly, the project design was directly aligned with the 2009-2020 YSLME regional SAP In China, the project objectives are consistent with a number of national and subnational strategies and plans, including the National 13th (2016-2020) Five-Year Plan (FYP) for Marine Economy Development and the 13th FYP's for Liaoning, Jiangsu, and Shandong provinces on Marine and Fisheries Development, Marine Functional Zoning, Marine Ecological Redline Protection Plan, and Marine Environmental Protection Plan. In South Korea, a few examples of complementary strategies and plans include the Basic Plan for the Restructuring of Inshore and Offshore Fisheries, the Marine Environment Monitoring Network, the Second Comprehensive Plan for the Management of Nonpoint Pollution Sources (2012-2020), the Second Basic Plan for Marine Litter Management (2014-2018), and the First Basic Plan for the Conservation and Management of Marine Ecosystems (2009-2018). The project was aligned with Objective 2 of the GEF-5 Programming Strategy for the International Waters focal area: "Catalyze multi-state cooperation to rebuild marine

Criteria	Rating	Comments
		fisheries and reduce pollution of coasts and Large Marine Ecosystems (LMEs) while considering climatic variability and change". The development objectives of the project were aligned with United Nations Development Assistance Framework (UNDAF) and the UNDP Country Programme Document (CPD) for China for the period of 2016-2020, specifically UNDAF Outcome #2, "More people enjoy a cleaner, healthier environment as a result of improved environmental protection and sustainable green growth", and CPD Output 2.1 "China's actions on climate change mitigation, biodiversity, and chemicals across sectors are scaled up, funded, and implemented".
Effectiveness	**Moderately Satisfactory**	Overall achievement of the project outcomes is rated as **moderately satisfactory**; brief analyses of each of the 16 outcomes is presented below.
Component 1: Ensuring Sustainable Regional and National Cooperation for Ecosystem-Based Management		
Outcome 1.1: Regional governance structure, the YSLME Commission established, operational and sustained The YSLME Interim Commission Council and the supporting regional working groups have facilitated consistent and substantive dialogue between the parties. At the time of the TE in September 2020, an MOU was under discussion between the countries that reportedly defines the parameters for continued progress towards achieving a durable YSLME regional governance arrangement. The draft, updated SAP provides a framework for prioritizing actions over the next 10 years, 2020-2030. The end target of having a functioning commission is unlikely to be achieved by project closure.		**Moderately Satisfactory**
Outcome 1.2: Improved inter-sector coordination and collaboration at national level Inter-ministerial coordination committee (IMCCs) meetings in China and South Korea were convened during the course of the project. There is limited information available regarding the details of the meetings. Endorsement of the updated SAP (2020-2030) currently under development would be an important example of inter-sectoral cooperation.		**Moderately Satisfactory**
Outcome 1.3: Wider participation in SAP implementation fostered through capacity building and public awareness The project has done a good job at engaging an expanded number and different stakeholder groups, including civil society and private sector. Stakeholder engagement was facilitated through technical working groups, training courses, study visits, seminars, demonstration site activities, public awareness campaigns, etc. One of the envisaged results under this outcome was as strengthened Yellow Sea Partnership (YSP); however, at project closure, the durability of the YSP as a stand-alone initiative seems unlikely.		**Satisfactory**
Outcome 1.4: Improved compliance with regional and international treaties, agreements, and guidelines Over the past 20-30 years, the Government of China has made significant progress in harmonizing national and subnational laws to the conditions of regional and international treaties, agreements, and guidelines they are contracted parties to. The review of implementation of the YSLME national action plan (2009-2020) provides a candid assessment of certain gaps in the current legislative framework, e.g., lack of an ecosystem-based point of view, lack of a national regulation on mariculture and on control of marine debris, lack of implementation rules on control of invasive species, lack of a cross-sectoral implementation mechanism, and a lack of international cooperation in development of laws and policies. Progress in terms of compliance reported by the Government of Korea in recent years include incorporating the Stockholm Convention criteria into the national POPS Control Act and Marine Environment Management Act, creating a management system to implement the IMO conventions on oil and hazardous and noxious substances (HNS), and improving enforcement methods on controlling compliance to conditions in the Ballast Water Management Convention. GEF additionality included delivering technical assistance in the completion of gap analyses, e.g., in terms of compliance with the FAO Code of Conduct for Responsible Fisheries, and in the development of regional guidelines for responsible fisheries in the YSLME; adoption of the guidelines had not occurred by the time of the TE.		**Satisfactory**
Outcome 1.5: Sustainable financing for reginal collaboration on ecosystem-based management secured based on cost-efficient and ecologically effective actions As part discussions regarding the next steps for advancing towards an agreement on a regional cooperation agreement, the parties are considering building upon existing technical cooperation structures which are jointly funded by the two countries. Sustainable financing options have been assessed under the project, including establishment of an environmental trust fund. Such a modality would provide opportunities for other parties to participate in the financing of a regional governance mechanism.		**Moderately Satisfactory**
Component 2: Improving Ecosystem Carrying Capacity with Respect to Provisioning Services		
Outcome 2.1: Recovery of depleted fish stocks as shown by increasing mean trophic level		**Satisfactory**

Criteria	Rating	Comments
The project metric for this outcome was the reduction of fishing vessels. China has reported a 22% reduction in the number of fishing vessels in the three YSLME provinces over the period of 2015-2018, and South Korea reports a 17% reduction from 2011-2017. These figures exceed the 10% end target. GEF additionality included assessment of the effectiveness and recommendations for improving the license system in the YSLME provinces in China; assessment of the effectiveness of the buy-back scheme; assessment of seasonal closures in the Yellow Sea; a socioeconomic assessment of the fishing vessel buy-back scheme, fish restocking, mariculture, and climate change adaption measures in Dalian, Weihai, and Dandong; and reemployment training of displaced fishers. The littoral countries have implemented other actions aimed at recovering fish stocks. In South Korea, designated closed areas and seasons for several fisheries have been substantively expanded, fishery resource surveys have expanded, further improvements to fishing gear (including eco-friendly gear). , and continued strengthening of fishery resource management systems, including implementation of Total Allowable Catch (TAC) systems (by 2017, TAC systems had been implemented for 18 species). In China there has been significant expansion of seasonal closures, with verifiable improvements. For example, catch per unit effort (CPUE) of demersal species increased from 46% in 2015 to 127.4% in 2017. Trophic levels (TL) are also on an increasing trajectory. Fishing gear regulations have also been stipulated in the YSLME provinces in response to Ministry of Agriculture limits stipulated in 2018 for 15 commercial species. China has introduced TAC systems since 2017, with 5 species currently covered. After 2020 the government has stipulated that total catch controls will be based on fisheries status determined from stock assessments. There were no joint stock assessments under the Phase II GEF project.		
Outcome 2.2: Enhanced stocks through restocking and habitat improvement Both countries have made significant investments in stock enhancements, including installation of artificial reefs, release of fry, marine forests, and marine ranching. In South Korea, a cumulative total of 16,107 ha of artificial reefs were installed between 2011 and 2016 (countrywide), 17,987 ha of marine forests were created between 2011 and 2018, and a cumulative total of 45 marine ranching projects were implemented between 2009 and 2017. In China, stock enhancement has increased since 2006 when the government issued the "Action Outline of Aquatic Living Resources Conservation in China". More than 100 species (including freshwater species) are released each year in the country. Stock enhancement in Shandong Province encompasses 19 marine species. Habitat improvement measures such as artificial reefs and marine ranching continue to be developed, with 62 marine ranching projects implemented nationally by 2017 and a goal to reach 120 by 2025. The metrics under this outcome included measurable improvement (5%) in standing stock and catch per unit effort, and future management decisions on restocking based on effectiveness. GEF funds were allocated for demonstration of seagrass transplanting techniques; an analysis of the Haiyang Fuhan national marine ranching demonstration area; and an analysis of artificial reefs installed in the Pipakou Waters of Haiyang City. Project progress reports refer to achievement of the 5% improvement in CPUE (the figures reported above under Outcome 2.1 are from the national action plan (2009-2020) review report). There is no information available regarding management decisions on restocking. A rating of satisfactory is applied for this output based on results reported by the national governments.		**Satisfactory**
Outcome 2.3: Enhanced and sustainable mariculture production by increasing productivity per unit area as a means to ease pressure on capture fisheries IMTA demonstration site activities report productivity improvements at levels exceeding the end targets, and the productivity gains have provided economic benefits to the operators. The pollution reduction figures for the IMTA installations at the demonstration site are better than the 5% end target; however, the results are somewhat anecdotal, i.e., lacking a statistically representative timeframe and sampling regime. Unsustainable mariculture practices remain a significant threat in the YSLME, regarding disruptions to the nutrient dynamics, incidence of harmful algal blooms, and spread of pathogens. Both countries have highlighted the need for further research on the benefits and performance of IMTA installations.		**Satisfactory**
Component 3: Improving Ecosystem Carrying Capacity with Respect to Regulating and Cultural Services		
Outcome 3.1: Ecosystem health improved through reductions in pollutant (e.g., N) discharge from land-based sources The end target for this outcome, i.e., a 10% reduction in nitrogen discharges in YSLME tributaries every five years seems somewhat overly ambitious. In South Korea, progress reports outline significant investments in expansion of sewerage coverage, increased application of measures to reduce non-point pollution discharges, and a decreasing trend of BOD concentrations in four major rivers. An increase in advanced wastewater treatment, from 56% in 2012 to 74% in 2016, will likely contribute to discharges of land-based nutrients in the coming years. China has also made substantial investments, but there have been challenges, e.g., in terms of atmospheric deposition of N from industrial emissions and limited improvements in terms of fertilizer reduction in the		**Moderately satisfactory**

Criteria	Rating	Comments
agricultural sector. Project progress reports make reference to information in the China Marine Ecology and environmental Status Bulletin (2018), indicating a 20% increase in total N inputs to the Yellow Sea and Bo Hai Sea from rivers in Liaoning and Shandong provinces from 2016 and 2018, and inputs from rivers in Jiangsu Province remain largely unchanged over that time period.		
Outcome 3.2: Wider application of pollution-reduction techniques piloted at the demonstration sites Ecological engineering approaches such as construction of artificial wetlands have been increasingly implemented in China and South Korea over the past 10 years for control of non-point source nutrient pollution. The GEF additionality included delivery of technical assistance to the wetland restoration in Jiaozhou Bay, Shandong Province, with recommendations on combatting the invasion of *Spartina alterniflora* vegetation and suggestions for updating the conservation and restoration plan. The work in Jiaozhou Bay is a restoration of a natural coastal wetland, not construction of an artificial wetland. The restored wetland has provided expanded habitat for migratory birds and other species, and also reportedly contributed to improvements to water quality and coastal fishery habitats. The project also produced a review report on the utilizing wetlands as nutrient sinks. During the field mission to Jiaozhou Bay, local stakeholders indicated that similar methods have been applied at sites along the Liao River and Yellow River basins, but documented information was not available on these sites or on wider replication of such ecological engineering approaches during the lifespan of the project.		**Moderately Satisfactory**
Outcome 3.3: Strengthened legal and regulatory process to control pollution Progress reports on achievement of Outcome 3.3 include explanations of the delay in updating or developing new marine environmental laws and regulations at the provincial and local levels, due to ongoing revisions of the national Marine Environmental Protection Law. The metric for this outcome, however, is the development of evaluation tools for assisting the harmonization of national and local legislation in the three YSLME provinces in China. There is no evidence of progress made in development of evaluation tools.		**Moderately Unsatisfactory**
Outcome 3.4: Marine litter controlled at selected locations Awareness on marine litter issues and corrective and preventative actions have increased in the YSLME littoral countries. In South Korea, the Second Basic Plan for Marine Litter Management was implemented between 2014 and 2018, and 200,000 to 400,000 tons of marine litter have been collected annually. Introduction of biodegradable fishing gear has been shared with Chinese counterparts. Although there is not yet specific legislation in China on marine litter, the government has made significant investments in improvements to solid waste management. The updated TDA (2020) outlines the increased recognition of microplastics affecting all trophic levels in the YSLME - one of the emerging issues that call for a regional strategy. GEF funds supported interventions led by NGOs in local communities on sustainable solid waste management, introduction of durable buoys, and increased awareness on preventing and controlling marine litter.		**Satisfactory**
Component 4: Improving Ecosystem Carrying Capacity with Respect to Supporting Services		
Outcome 4.1: Maintenance of current habitats and the monitoring and mitigation of the impacts of reclamation In 2018, the Government of China prohibited any further reclamation, through issuance of Notice No. 24 from the State Council. This notice also stipulates that handling of legacy problems from reclamation projects will be accelerated. The Government of Korea has declared no further reclamation of critical coastal habitats; however, some reclamation developments that were approved prior to this declaration are allowed to continue. There has been a significant increase in the number and coverage of marine protected areas. From 2011 to 2017, the number of MPAs in South Korea went from 15 to 28, covering a cumulative area of 288.624 km^2 and 586.379 km^2, respectively. The concept of marine redline designation was first promoted in China by the SOA, and since that time the three YSLME provinces have designated more than 10% of their marine ecosystems as redline areas, where development activities are prohibited. The number of MPAs, wetland protected areas, and germplasm resource conservation zones have also increased over the lifespan of the project. The GEF additionality under this outcome also included technical studies on coastal reclamation and impacts to critical coastal habitats, on improving the effectiveness and impacts of ecological restoration, a framework plan for the YSLME biodiversity conservation in the Republic of Korea (2018-2030), and a YSLME biodiversity conservation plan (2018-2030). There was no evidence showing the uptake of some of the recommended technical methodologies or of adoption of the biodiversity conservation plans. Under the small grant mechanism on the project, grants were awarded to scientific organizations and NGOs – including the Chinese Academy of Fishery Science, which supported strengthening of the management and monitoring capacities and capabilities of MPAs; the Beijing Chaoyang District Yongxu Global Environmental Institute, which promoted community co-management to strengthen protection of seabirds, ensure sustainable small-scale fishing practices, and promote regional cooperation and exchange among communities long the East Asian-Australian Flyway; the Institute of Geographic Sciences and Natural Resources Research for improving the understanding of migratory bird habitats and ecological connectivity; and the Society of		**Satisfactory**

Criteria	Rating	Comments
Entrepreneurs and Ecology Foundation, in association with IUCN, to strengthen regional cooperation on the conservation of YS intertidal and coastal wetlands.		
Outcome 4.2: MPA network strengthened in the Yellow Sea The project has facilitated strengthened knowledge on habitat connectivity in the YSLME and developed tools for integrating connectivity principles into conservation initiatives, e.g., for the spotted seal and spoon-billed sandpiper. Proposed priority conservation areas and opportunities for improving connectivity with existing and new MPAs have been documented and shared with YSLME stakeholders. Moreover, a MPA Network Development Training Toolkit was developed and training delivered. The project had plans to further socialize the toolkit in 2020, but the COVID-19 pandemic has prohibited moving forward with these activities.	**Moderately Satisfactory**	
Outcome 4.3: Adaptive management mainstreamed to enhance the resilience of the YSLME and reduce the vulnerability of coastal communities to climate change impacts on ecosystem processes & other threats identified in the TDA and SAP Integrated coastal management (ICM) has been mainstreamed into local development planning structures in 22 coastal cities, covering about 12% of the coastline of China, including the city of Lianyungang in Jiangsu Province, and in three cities along the coast of Bo Hai Sea. The ICM work in China has been made in cooperation with PEMSEA since 2014. There was limited collaboration between the project and the ICM work in Lianyungang (missed opportunity). ICM in South Korea is mandated through the Coastal Management Act, with stipulates that ICM plans need to be formulated every 10 years. The requirements were further elaborated in the Second Plan for Integrated Coastal Management. Among the 74 local governments in coastal areas, 46 (62%) have completed ICM plans. GEF additionality included a stock-taking report on the relationship between sea surface temperature changes of the YS Cold Water Mass (YSCWM) and the structure of plankton communities. Definitive conclusions were precluded due to the lack of taxonomy data from plankton samples and the need to conduct high-resolution biophysical modeling on plankton dynamics. A rating of moderately satisfactory is applied because of limited progress on incorporating CC adaptation strategies incorporated in regional strategies, and of unspecific number of ICM plans in the end target. Other studies supported by the GEF funds included a vulnerability assessment of sea level rising in Dandong, an impact assessment of sea level rising on wading birds in Dandong, and the effects of sea ice on the development of the Dandong coastal zone and marine species. These studies fed into the formulation of a model and database on marine vulnerability assessment for Dandong City – providing important tools for improving resilience at the local and national levels.	**Moderately Satisfactory**	
Outcome 4.4: Application of Ecosystem-based Community Management (EBCM) in risk management plans to address climate variability and coastal disasters The project has made substantive contributions regarding continued dialogue, scientific exchanges, and development of monitoring programs, a Regional Jellyfish Monitoring Program and a Comprehensive Regional Monitoring system: Monitoring Strategies for Climate Change, N/P/Si Changes, HABs, and Jellyfish Blooms. These two programs have been discussed at the technical level by relevant stakeholders on multiple occasions; however, they have not yet been approved by the two countries, and it is unclear if there are commitments in place to further advocate for approval after the GEF project closes. Agreeing to common regional monitoring and data-sharing protocols is an important aspect of regional cooperation.	**Moderately Satisfactory**	
Efficiency	**Moderately Satisfactory**	Project efficiency was affected by the 3-year delay in starting the project implementation and the time needed for the second PMO team to build back momentum. Approx. 63% of the GEF project grant has been expended in the last two years of the project, i.e., 2019-2020, and there has been limited time to gain approval of the various guidelines and strategies developed under the project. Updating the TDA and SAP as part of the agreement to grant the project no-cost, time extensions was an opportune decision; however, garnering support of a 10-year SAP takes time (it took 3 years to reach endorsement of the first SAP in the Phase I project). The COVID-19 pandemic has compounded the efforts of the project to deliver during the final year, when projects are often faced with finalizing a number of deliverables. The broad scope included in the project strategy presented implementation and quality challenges, i.e., the GEF resources were spread fairly thin across the thematic subject areas. And combining the position of Chief Technical Advisor (CTA) and Project Manager might not have been the most efficient approach. Coordinating the technical activities among the numerous project partners and 6 regional and 6 national working groups required considerable time, as well as reporting on progress and ensuring quality and timeliness of deliverables.

Criteria	Rating	Comments
Overall project outcome rating	**Moderately Satisfactory**	Significant improvements were made during the second half of the project. The project remains high relevant at closure and the parties have accelerated discussions on reaching an agreement on regional governance arrangements. Shortcomings in project efficiency impact the overall project outcome rating, e.g., many activities were carried out in the last 1-2 years of the project implementation timeframe, which has extended from 2014 to 2020. There has been limited time to socialize some of the technical deliverables and to advocate for approval of regional conservation and monitoring strategies.
4. Sustainability		
Financial sustainability	**Likely**	There is a high likelihood that financial resources will continue to be available after GEF funding ends. National and subnational plans and programs for coastal and marine areas in China and South Korea have been consistent with the priorities included in the 2009-2020 YSLME. For example, the Government of South Korea reported USD 6.89 billion of financing in the period of 2014-2020 for coastal and marine initiatives across the country. There have also been significant investments made by the Government of China, including USD 192 million of co-financing for the project. Sustainable financing options for a regional governance mechanism were assessed under the project and included an environmental trust fund. Over the short-term, discussions seem to be leading towards utilizing existing technical cooperation structures for delivering secretariat related functions for a YSLME regional collaboration arrangement. Other projects and initiatives further enhance the financial dimension of sustainability. For instance, the GEF-7 East Asian-Australian Flyway project under development would advance regional cooperation on biodiversity conservation in the YSLME (and beyond). The YSLME littoral countries continue their involvement in complementary regional initiatives, including SDS-SEA, NOWPAP, NEAMPAN, etc. Under their Blue Plant fund, WWF China is operating a small grants program focused on coastal and marine issues, including in the YSLME.
Socio-political sustainability	**Moderately Likely**	Country ownership was high throughout the project. The Korean Ministry of Oceans and Fisheries (MOF) and the Ministry of Foreign Affairs have been consistently involved. In China, the main focal point was elevated during Phase II to a ministry level, through the establishment of the Ministry of Natural Resources (MNR), which is conducive to the need for integrated management of marine and terrestrial ecosystems. The key stakeholders that were involved on the project were largely from the scientific and technical community focused on fisheries and marine management. There was limited engagement with stakeholders related to land-based pollution from production sectors or with subnational authorities responsible for coastal zone development. The project was successful in expanding stakeholder participation with involvement of civil society and the private sector. The small grants awarded on the project went only to Chinese NGOs; it would have been advisable to open the calls for proposals to Korean NGOs also. High quality knowledge products and an active website containing extensive information enhance the likelihood of sustaining the results achieved on the project. There is a degree of uncertainty on the likelihood that some of the guidelines and strategies will be advocated and replicated after project closure. The participation of North Korea, one of the littoral countries of the YSLME, was prohibited during Phase II as a result of international sanctions. Overall sustainability is diminished with the lack of involvement of North Korea, but this is beyond the control of the project stakeholders.
Institutional framework and governance sustainability	**Moderately Likely**	Whilst there has been sustained dialogue between the parties over the course of the project on the subject of establishing a regional YSLME governance structure, there remain uncertainties at project closure. The MOU that is under discussion significantly strengthens the prospects for achieving a cooperation arrangement, and the 2020-2030 regional SAP provides a blueprint for prioritizing regional actions. The functioning of the regional and national working groups on the project facilitated improved interaction and strengthened capacities of institutional partners. Inter-Ministerial Coordination Committees (IMCCs) convened periodically to ensure high

Criteria	Rating	Comments
		level engagement and cross-sectoral cooperation; there is limited information on the results of the IMCC meetings and decisions. In both countries there are several individuals who have had extensive involvement, including engagement during the Phase I project, and are committed and motivated to further advance the processes of regional collaboration. It would be advisable to ensure those individuals remain engaged.
Environmental sustainability	**Moderately Likely**	The countries have made substantive progress towards controlling and reducing pollution to the YSLME, including investments in advanced and expanded wastewater treatment, improved agricultural and mariculture practices, better solid waste management (including marine debris), and adoption of integrated coastal management approaches. The Phase II YSLME project provided incremental benefits in facilitating dialogue on regional biodiversity conservation, including regional MPA networks, demonstrating reduced pollution through application of integrated multi-trophic aquaculture (IMTA), demonstration of results achieved from restoring reclaimed areas to natural wetlands, supporting initiatives associated with reducing fishing vessels and updating licensing programs, and expanding the knowledge base on the impacts of pollution and climate change to the YSLME. Pollution and climate change related issues remain significant concerns. In fact, three of the emerging issues identified in the 2020 TDA are associated with pollution, i.e., air pollution from industrial emissions, marine plastics attributed to the overuse of plastics and inadequate control of marine litter, and contaminants of emerging concern that are related to sewage discharge. The findings of the TDA also point out worsening trends associated with changes in biomass and species composition, driven by pollution and regional climate change (warming, decreased pH levels).
Overall likelihood of sustainability	**Moderately Likely**	The project helped facilitate progress towards achieving a regional governance mechanism for the ecosystem-based management of the YSLME. The parties have not yet reached a formal agreement, but there has been accelerated dialogue in 2020 on reaching agreement on an MOU that outlines the parameters and next steps for a durable regional cooperation arrangement. The updated regional SAP (2020-2030) developed under the project provides a practical framework for orienting the priorities for regional collaboration over the short to medium term. Increased cooperation among the scientific and technical community was strengthened through the functioning of the national and regional working groups. And the Phase II project helped facilitate expanded stakeholder engagement, particularly among the NGO and private enterprise sectors. Production sectors had limited involvement, including with the Joint Management Committee for the 2001 Yellow Sea fisheries agreement between China and South Korea, and with stakeholders responsible for controlling and monitoring land-based pollution. Current threats to the YSLME are driven by uncoordinated management and inadequate control of pollution, including industrial emissions, agriculture and mariculture, sewage discharge, solid waste (particularly plastics). Strengthening ecosystem resilience, including improving disaster preparedness and upscaling local coastal zone management plans into regional strategies that address ecosystem vulnerabilities to the predicted climate change scenarios. These aspects are included in the updated SAP that is under development; endorsement of the 2020-2030 regional SAP would enhance the likelihood that sustainable management of the YSLME will be achieved over the long-term.

RECOMMENDATIONS

TE recommendations are presented below in **Table 3**.

***Table 3**: Recommendations table*

No.	Recommendation	Responsible Entities	Timeframe
1.	**A sustainability plan should be prepared prior to project closure**. It would be advisable to prepare a sustainability plan that outlines the follow-up actions to ensure the durability of the results achieved. For example, endorsement of the 2020-2030 SAP, approval of the MOU currently under discussion, migration of project documentation including knowledge products, socialization of the MPA connectivity toolkit, advocacy strategy for engaging North	PMO, UNDP	2020 Q4

	Korea, etc. The sustainability plan should also include an analysis of the risks and opportunities associated with the COVID-19 pandemic.		
2.	**Identify YSLME champions for sustaining the Yellow Sea Partnership.** Specific individuals and/or organizations should be designated as YSLME champions, who agree to voluntarily facilitate and advocate for implementation of the sustainability plan, and to help sustain the Yellow Sea Partnership.	PMO, ICC	2020 Q4
3.	**Building upon the existing technical cooperation structures for the YSLME regional governance mechanism is sensible**. Instituting the YSLME regional governance mechanism through an expanded mandate of existing technical cooperation arrangements, such as the one between FIO and KIOST in Qingdao, would be a practical approach. There are minimal barriers with respect to cooperation among the scientific and technical communities and joint financing mechanisms are in place and could probably be upscaled fairly easily with limited additional administration. The cooperation could be incrementally expanded to other sectors, including governmental administration, civil society, private sector, etc.	ICC	2020-2021
4.	**A follow-up GEF project should focus more on regional issues and have a narrower scope**. It is clear that the governments of China and South Korea continue to invest substantial funds into improving environmental conditions of coastal and marine environments. The GEF additionality on an international waters project should focus more on regional activities that the littoral countries might not be addressing individually or bilaterally, and on emerging issues and innovative approaches. For example, collaborative total allowable catch (TAC) initiatives linked up with joint stock surveys is in line with the priorities outlined in the draft, updated SAP. Microplastics, atmospheric deposition, and emerging pollutants are also issues that require more joint effort, as the impacts are increasingly seen across all trophic levels of marine ecosystems.	ICC, UNDP	Upon endorsement of the updated SAP
5.	**The Joint Fisheries Committee (JFC), associated with the 2001 Fishery Agreement between South Korea and China, should be engaged in the ecosystem-based management of the YSLME**. It is important to connect the production based decisions made by the JFC with stakeholders involved in management and conservation of fisheries and the ecosystems supporting them.	ICC	1-2 years
6.	**Regional MPA initiatives offer opportunities for further strengthening joint collaboration**. For instance, the members of the East Asian-Australian Flyway Partnership (EAAFP) include the YSLME littoral countries (as well as North Korea) and several international NGOs. The is a GEF-7 currently under development with support of the UNDP. The YSLME countries are also participating in the North-East Asian Marine Protected Areas Network (NEAMPAN). Socializing the MPA connectivity toolkit among these other initiatives could be an effective way to advocate for the priorities highlighted under the Phase II YSLME project.	Yellow Sea Partnership, UNDP	Ongoing
7.	**Broaden stakeholder engagement among the agriculture and water resources management sectors.** Engagement with these sectors is imperative for developing land-based pollution reduction strategies that consider the complex linkages between terrestrial, freshwater, and marine ecosystems.	ICC, Yellow Sea Partnership	1-2 years
8.	**Promote development of a regional integrated coastal management strategy that consolidates or clusters local level ICM plans**. This is a viable entry point for cross-sectoral and regional collaboration, e.g., through development of joint early warning systems, sharing lessons learned and approaches.	ICC, Yellow Sea Partnership	1-2 years
9.	**Strengthen regional NGO collaboration on innovative approaches, training, and public awareness.** Regional NGOs can bring innovative knowledges and tools for addressing the challenges facing the YSLME. For example, the approach towards strengthening public awareness on the classification of marine litter could be more explored among regional NGOs, and developing more effective ways to share knowledge under relevant domestic circumstances. Overcoming the language barriers should also be included in the collaboration strategy, e.g., through training, interpretation tools, etc.	Yellow Sea Partnership	Ongoing

LESSONS LEARNED

Good practices and lessons learned on the project are presented below.

Good Practices:

- The mechanism of establishing regional working groups (RWGs) across six thematic subjects was good practice for facilitating effective regional cooperation at the technical and political levels.

- Involvement of key stakeholders in the Phase I and Phase II projects helped maintain consistency and coherency on addressing the issues facing the YSLME
- Assigning coordination duties to the National Coordinator of NWG-G was a good practice in facilitating strong country ownership.
- Collaboration with other regional initiatives, e.g., SDS-SEA, NOWPAP, NEAMPAN, etc., was a good practice that enhances the likelihood that results achieved on the project will be sustained after project closure.
- The project website was maintained current with a comprehensive set of information posted, providing a practical platform for knowledge and information transfer.
- Production of high quality knowledge products, including videos, and utilization of the IW:Learn platform enhance the effectiveness of knowledge management.
- Expanding stakeholder engagement among civil society organizations and private sector was a good practice at facilitating multi-stakeholder buy-in for conservation and sustainable production initiatives.

Lessons Learned:

- The project scope was too broad, presenting both implementation and quality challenges.
- The 4-year timeframe for project implementation was too short, considering the complex project strategy and the time typically required to facilitate transboundary water governance.
- The demonstration activities under Components 2 and 3 should have been more oriented towards regional cooperation.
- The project indicator framework was not fully validated during project preparation or at project inception, resulting in confusion on interpretation and reporting of some of the results on the project. Developing a detailed monitoring plan would have also benefitted project monitoring and evaluation.
- A stakeholder engagement plan was not prepared for the project. There were shortcomings in stakeholder engagement that might have been addressed through development of a stakeholder engagement plan.
- Interaction across the working groups would have helped facilitate better cross-sectoral, inter-sectoral, and regional coordination.
- Combining the Project Manager and Chief Technical Advisor functions into one position was an under-estimation of the workload required for these two roles.
- A gender analysis and action plan should have been prepared at the project preparation phase (or at inception) to orient the gender mainstreaming strategy of the project.
- Social and environmental risks were not assessed in detail, and there were no safeguard plans developed for the project.
- The language barrier between Chinese and Korean stakeholders constrain engagement among some stakeholder groups. It would be advisable to ensure sufficient budget is allocated for adapting and overcoming this barrier.
- Cofinancing allocations should extend beyond project closure to cover follow-up actions. Allocation of cofinancing contributions should extend beyond the date of project closure, e.g., by 2-3 years, to cover the cost and oversight for follow-up actions.

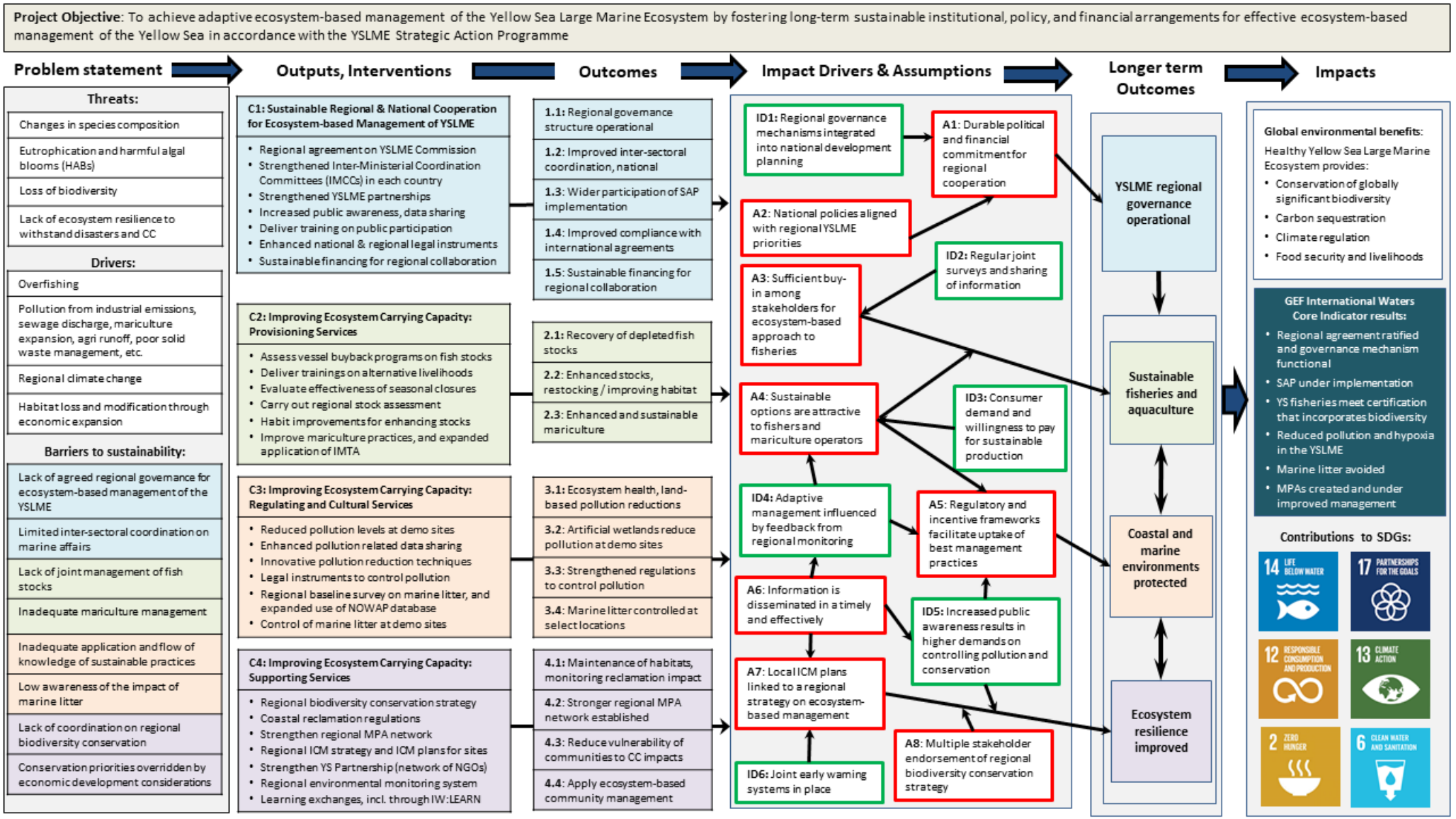

Figure 1: Theory of change

Abbreviations and Acronyms

CBD	Convention on Biological Diversity
CN	People's Republic of China
CO	Country Office
CPD	Country Programme Document
CPAP	Country Programme Action Plan
CPUE	Catch per unit effort
EAS	East Asia Seas
EBCM	Ecosystem-based community management
FAO	Food and Agriculture Organization of the United Nations
FIO	First Institute of Oceanography (China)
FYP	Five-Year Plan
GEF	Global Environment Facility
HABs	Harmful Algal Blooms
HNS	Hazardous and Noxious Substances
ICC	Interim Commission Council
ICM	Integrated Coastal Management
IMCC	Inter-ministerial Coordination Committee
IMTA	Integrated multi-trophic aquaculture
IW	International waters
KIOST	Korea Institute of Ocean Science and Technology
LME	Large marine ecosystem
M&E	Monitoring and Evaluation
MARA	Ministry of Agriculture and Rural Affairs (China)
MEE	Ministry of Ecology and Environment (China)
MNR	Ministry of Natural Resources (China)
MOF	Ministry of Oceans and Fisheries (Republic of Korea)
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MTR	Midterm Review
NCSEMC	North China Sea Environmental Monitoring Center
NEAMPAN	North-East Asian Marine Protected Areas Network
NGO	Non-Governmental Organization
NMEMC	National Marine Environmental Monitoring Center
NOWPAP	North West Pacific Action Plan
NSAP	National strategic action plan
NWG	National working group. NWG-F: Fisheries; NWG-M: Mariculture; NWG-H: Habitats; NWG-P: Pollution; NWG-A: Assessment; NWG-G: Sustainability (Finance and Governance).
PCA	Partner Cooperation Agreement
PEMSEA	Partnerships in Environmental Management for the Seas of East Asia
PIF	Project Identification Form
PIMS	Project Information Management System
PIR	Project Implementation Report
PM10, PM2.5	Particulate matter (atmospheric), 10 micron and 2.5 micron diameter
PMO	Project Management Office
PMZ	Provisional Measures Zone

POPS	Persistent Organic Pollutants
RK	Republic of Korea
RTA	Regional Technical Advisor
RWG	Regional working group. RWG-F: Fisheries; RWG-M: Mariculture; RWG-H: Habitats; RWG-P: Pollution; RWG-A: Assessment; RWG-G: Sustainability (Finance and Governance).
SAP	Strategic action programme
SDS-SEA	Sustainable Development Strategy for the Seas of East Asia
SOA	State Oceanic Administration (China)
TAC	Total Allowable Catch
TDA	Transboundary diagnostic analysis
TE	Terminal evaluation
TL	Trophic Level
TORs	Terms of References
UNCLOS	United Nations Convention on the Law of the Sea
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNFCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
USD	United States Dollar
WHO	World Health Organization
YS	Yellow Sea
YSCWM	Yellow Sea Cold Water Mass
YSFRI	Yellow Sea Fisheries Research Institute
YSLME	Yellow Sea large marine ecosystem
YSP	Yellow Sea Partnership