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MID TERM EVALUATION
UNDP/GEF YELLOW SEA LARGE MARINE ECOSYSTEM

PREFACE

This mid term evaluation report sets out findings, lessons learned and recommendations for the UNDP/GEF Yellow Sea Large Marine Ecosystem Project (YSLME). The report is developed in compliance with the Terms of Reference for the assignment. It is based upon collected reference materials from the project, as well as a series of interviews carried out during an evaluation mission in the region, during August 2007. The conclusions and recommendations set out in the following pages are solely those of the evaluators and are not binding upon the project management & sponsors.

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Summary

The Yellow Sea Large Marine Ecosystem Project (YSLME) has been established through the GEF and partner countries – China and Korea, to support ecosystem-based environmentally sustainable management for the Yellow Sea and its watershed. The Yellow Sea is amongst the 50 largest marine ecosystems (LMEs) in the world, and has been one of the most significantly affected by human development. Today the Yellow Sea faces serious environmental problems, many of a transboundary nature, that arise from anthropogenic causes.

This Mid-term Evaluation Report (MTE report) constitutes the combined outcome of a literature review and evaluation mission, including a series of interviews of selected stakeholders from Korea and China carried out in August 2007. The evaluation is being carried out on behalf of UNDP and UNOPS, the project's implementing and executing agencies.

A review of work plans and budget documents, coupled with interviews of stakeholders and the project team give evidence that the YSLME project management office (PMO) is well-managed and includes an experienced and effective project team. Appropriate financial and project management structures have been set in place based on GEF/UNDP/UNOPS guidelines. Expectations for a well-functioning Project Steering Committee (PSC) Regional Science and Technology Committee, and Regional Working Groups (RWGs) have been fulfilled. The PMO is working with an accomplished array of scientists and managers in key institutions of the Peoples Republic of China (PRC) and Republic of Korea (ROK).

The project has chalked up some notable achievements, in particular the completion and approval of the TDA, and successful efforts to engage parliamentarians from both countries. The project has also faced some setbacks, most notably an inability of the partner countries to agree on the scope of activities to be carried out during a planned cooperative cruise. At the halfway point, roughly 1/3 of the project budget has been utilised.

A great opportunity may be presented in the near future to expand the Yellow Sea partnership to include the Democratic Peoples Republic of Korea (DPRK). Within UNDP/GEF-approved parameters and timeframes, the project team and partner countries should make every effort to engage the DPRK as a full and active partner in the YSLME. The partner countries should also consider establishing a Yellow Sea Commission and Secretariat, to serve as the frame for future joint efforts and international support.

Glossary

APR	Annual Project/Programme Report
AQA	Analytical Quality Assurance
AQC	Analytical Quality Control
BAP	Best Agricultural Practices
BAT	Best Available Technology
BEP	Best Environmental Practices
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DQA	Data Quality Assurance
DPRK	Democratic Peoples Republic of Korea
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographical Information System
HoD	Head of Delegation
IFI	International Financing Institution
IGO	Inter-Governmental Organisation
IMCC	Inter-Ministerial Coordination Committee
IW	International Waters
JAP	Joint Action Program
KEI	Korea Environmental Institute
KORDI	Korea Ocean Research and Development Institute
LFA	Logical Framework Approach
MOMAF	Ministry of Maritime Affairs and Fisheries (Korea)
MOFAT	Ministry of Foreign Affairs and Trade (Korea)
M&E	Monitoring and Evaluation
MOU	Memorandum of Understanding
MPA	Marine Protected Area
MTE Report	Mid-Term Evaluation Report
NGOs	Non Government Organizations
OP8	Operational Programme 8
PCSD	Presidential Committee for Sustainable Development (ROK)
PIF	GEF Project Identification Form
PIR	Project Implementation Review
PMO	Project Management Office
ProDoc	Project Document
PRC	Peoples Republic of China
PRP	Pollution Reduction Program
RBM	River Basin Management
ROK	Republic of Korea
RSTP	Regional Science and Technical Panel
SAP	Strategic Action Plan
SEPA	State Environmental Protection Administration (China)
SGP	Small Grants Programme
SOA	State Oceanic Administration (China)
TDA	Transboundary Diagnostic Analysis
UNDP	United Nations Development Program
UNOPS	United Nations Office for Project Services
USD	United States Dollar
WWF	Worldwide Fund for Nature
YSEPP	Yellow Sea Eco-region Planning Programme (WWF, KORDI, KEI)

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1 THE YSLME AND IT'S DEVELOPMENT CONTEXT

1.1 BACKGROUND

The following background description includes several sections setting out Yellow Sea status and trends, and ecosystem pressures. This information has been compiled largely from the YSLME Project Document and Transboundary Diagnostic Analysis.

1.1.1 GENERAL

The Yellow Sea is a semi-enclosed body of water bounded by the Chinese mainland to the west, the Korean Peninsula to the east, and a line running from the north bank of the mouth of the Yangtze River (Chang Jiang) to the south side of Cheju Island. It covers an area of about 400,000 km² and measures about 1,000 km (length) by 700 km (maximum width). The floor of the Yellow Sea is a geologically unique, post-glacially submerged, and shallow portion of the continental shelf. The seafloor has an average depth of 44 m, a maximum depth of about 100 m, and slopes gently from the Chinese continent and more rapidly from the Korean Peninsula to a north-south trending seafloor valley with its axis close to the Korean Peninsula. This axis represents the path of the meandering Yellow River (Huang He) when it flowed across the exposed shelf during lowered sea level and emptied sediments into the Okinawa Trough. The Sea annually receives more than 1.6 billion tons of sediments, mostly from the Yellow River (Huang He) and Yangtze River, which have formed large deltas.

The Yellow Sea is connected to the Bo Hai Sea in the north and to the East China Sea in the south, forming a continuous circulation system. Major rivers discharging directly into the Yellow Sea include the Han, Yangtze, Datung, Yalu, Guang, and Sheyang. The Liao He, Hai He, and Yellow River around the Bo Hai have important effects on salinity in the western Yellow Sea, whereas the Yangtze River exerts strong influence on the hydrography of the southernmost part of the Sea. All rivers have peak runoff in summer and minimum discharge in winter.

The Yellow Sea LME is an important global resource, supporting substantial populations of fish, invertebrates, marine mammals, and seabirds. Many of these resources are threatened by both land and sea-based sources of pollution and habitat loss resulting from extensive economic development in the coastal zone, and by the unsustainable exploitation of natural resources (primarily over-fishing). Additionally, there is significant international shipping traffic through the waters of the Yellow Sea, with associated threats from spills and collisions with marine mammals.

Biotic communities of the south-eastern Yellow Sea are complex in species composition, spatial distribution, and community structure possibly due to the complicated oceanographic conditions of the area. Faunal communities are composed of various taxonomical groups of warm and cold-water species as well as cosmopolitan and amphi-Pacific ones. Yet the diversity and abundance of the fauna are comparatively low. Marked seasonal variations are the main characteristics of all components of the biotic communities. Turbidity and sediment type appear to be the major parameters that affect the distribution of planktonic and benthic organisms in the coastal waters of the Yellow Sea.

1.1.2 HYDROGRAPHY AND BENTHIC SEDIMENTS

The hydrographic properties and circulation of the Yellow Sea are created predominantly by winter cooling and summer heating, freshwater discharge from rivers and, arguably the inflow of warm saline waters in a branch of the Kuroshio. Wind-forcing and freshwater runoff are also influenced by the cold and dry northerly winter monsoon and the warm humid southerly summer monsoon.

The sediments of the Yellow Sea are mostly terrigenous, carried by rivers and winds from surrounding lands. The annual input of fine-grained detritus to the Bohai Sea was, until recently, approximately 1 billion tonnes per year, mainly from the Yellow River. The Changjiang (Yangtze River) discharges some 500 million tonnes of alluvial sediments per year. Other rivers discharge only 50 million tonnes of sediments, including a considerable amount of coarse-grained material from rivers in the Korean Peninsula.

1.1.3 FISHERIES & MARICULTURE

The Yellow Sea is one of the most intensively exploited areas in the world. The number of species commercially harvested is about 100, including cephalopods and crustacea. The abundance of most species is relatively small, and only 23 species exceed 10,000 MT in annual catch. These are the commercially important species and account for 40 to 60 percent of the annual catch. Demersal species used to be the major component of the resources and accounted for 65 to 90 percent of annual total catch. The resource populations of demersal species such as small yellow croaker, hairtail, large yellow croaker, flatfish, and cod declined in bio-mass by more than 40 percent when fishing effort increased threefold from the early 1960s to the early 1980s.

Over fishing has also caused a decline in stock abundance for searobin, red sea bream, *Otolithoides mijuy*, *Nibea albiflora*, and white croaker. However, under the same fishing pressure, the abundance of some species such as cephalopods, skates, and daggertooth pike-congers appears to be fairly stable. This may be due to their scattered distribution or their tolerant nature.

Shifts in species dominance in the Yellow Sea are outstanding. The dominant species in the 1950s and early 1960s were small yellow croaker and hairtail, whereas Pacific herring and chub mackerel became dominant during the 1970s. Some smaller-bodied, fast-growing, short-lived, and low-value fish (e.g., *Setipinna taty*, anchovy, scaled sardine) increased markedly in about 1980 and have taken a prominent position in the ecosystem resources thereafter. As a result, some larger-sized and higher trophic level species were replaced by smaller-bodied and lower trophic level species, and the resources in the Yellow Sea declined in quality. About 70 percent of the bio-mass in 1985 consisted of fish and invertebrates smaller than 20 cm, and the mean body length in the catches of all commercial species was only 12 cm while the mean body length in the 1950s and 1960s exceeded 20 cm. The trophic levels in 1985 and in the 1950s were estimated to be 3.2 and 3.8, respectively. Thus it appears that the external stress of fishing has affected the self-regulatory mechanism of the Yellow Sea ecosystem.

Aquaculture is a major use of the coastal waters of the Yellow Sea. Mariculture is commonly practiced in all coastal provinces of China, and it is most advanced in Shandong and Liaoning provinces. In both the Qingdao and Dalian regions the same fishery communes that culture invertebrates also cultivate seaweed. The major species of invertebrates cultured are oysters, mussels, razor clams, cockles, short-necked clams, pearl oysters, scallops, and hard clams. The area in mariculture in 1978 was 1.48 x 10⁵ ha, and 5.4 x 10⁵

ha in 1997. The yield of fresh flesh from bivalves was 2.0 x 10⁵ t, 44 percent of the total mariculture yield in 1978; in 1997 it was 3 x 10⁵ t. Sea cucumbers (*Stichopus japonicus*) live below *Laminaria* and/or *Mytilus* and are harvested by divers after two years' growth. *Meretrix meretrix*, *Mactra antiquata*, *Brachydontes senhousei*, and *Aloidis* sp. are also cultured in some regions, and the large Chinese shrimp (*Penaeus orientalis*) also grows successfully in the coastal regions of the Yellow Sea.

The total yield of invertebrate mariculture of ROK in 1997 was 301,873 metric tons (MT) representing 29.7% of ROK's total mariculture production (1,015,134 MT), including 200,973 MT of oysters (20 percent) and 63,572 MT of mussels (6.3 percent) (Ministry of Maritime Affairs & Fisheries, 1998, Annual Report of Fisheries Trend. 286p.) Major species of mariculture include oyster, mussel, abalone, hard clam, short-necked clam, *Cyclina*, *Mactra*, ark shell (*Anadara broughtonii*), pen shell (*Atrina pectinata*), and hen clam (*Mactra sulcataria*). Various abalones (*Haliotis discus hannai*, *H. discus*, *H. sieboldi*, *H. gigantea*, *H. japonica*) are in high demand.

Seaweed is an important crop in the Yellow Sea. Seaweed grows naturally on the lower rocks of the intertidal/sub-intertidal region; most prefer subtropical conditions. *Sargassum pallidum* is dominant and *Plocamium telfairiae* is common in the west Yellow Sea. There, *Pelvetia siliquosa* is locally abundant. *Bryopsis plumosa* is a minor species, and *Dictyopteris undulata* is rare. *Pelvetia siliquosa* is found on the Shandong Peninsula, the Liaodong Peninsula, and the Korean Peninsula. The seaweed grows more luxuriantly in the Korean waters, and for hundreds of years the Koreans have exported large quantities of this seaweed to China. It was sold in North China markets under the name of deer-horn vegetable. The seaweed's availability has declined, and now the seaweed *Ishige okamurai* and seaweed *Sargassum (Hizikia) fusiforme* are marketed as substitutes—also called Lujiaocai.

The most important cultivated seaweed in China is the brown *Laminaria japonica* introduced from Hokkaido, Japan. The cold water kelp is now grown in more than 3,000 ha of China's coastal waters, with a production of 10,000 dry tons/year. Half of this is consumed directly and half is used for extraction of alginates. There are 15 hatcheries on the north China coast, and the young plants are transferred to the growing frames in the sea when the seawater temperature drops below 20°C. *L. japonica* grows 3-m fronds at Qingdao and 5-m fronds at Dalian where the water cools down more quickly in fall and the growing season is longer. The respective yields are 30 and 50 dry tons/ha/year.

Unlike animal mariculture, seaweed culture is non-polluting. Indeed, seaweeds absorb nutrients (which has become pollutants) and improves water quality (e.g. generally increases dissolved oxygen content). Unfortunately, as a result of lower price (compared to animal mariculture), the culture of seaweed has significantly declined over the years.

1.1.4 POLLUTION

In the western Yellow Sea, pollution sources include industrial wastewater from Qingdao, Dalian, and Lianyungang port cities; oil discharged from vessels and ports; and oil and oily mixtures from oil exploration. More than 100 million tons of domestic sewage and about 530 million tons of industrial wastewater from coastal urban and rural areas are discharged into the near shore areas of the Yellow Sea each year. The major pollutants carried by sewage and wastewater are oils, mercury, cadmium, lead, COD, and inorganic nitrogen.

Harmful Algal Blooms (HAB) occurring in the coastal waters off southern and eastern ROK have caused loss to the aqua-culture industry and probably large-scale mortality of natural

fin- and shellfish. However, the frequency and the area of the outbreak of HABs in the coastal waters off western ROK (Yellow Sea) are lower than those off southern and eastern ROK. High turbulence intensity and turbidity caused by strong tidal current might inhibit the growth of HAB organisms.

1.2 PROJECT START AND ITS DURATION

The YSLME had a long germination period. The initial concepts for the project grew out of meetings held in 1992, sponsored by the World Bank and the US National Oceanographic and Atmospheric Administration (NOAA). The project commenced in April 1999, with initiation of the PDF-B planning process. In June and July of 1999 the partner countries held their first interministerial committee meetings and first national stakeholder meetings. During the PDF-B process, the partner countries carried out a comprehensive review synthesis and analysis of existing information of the sources and fate of transboundary pollutants in the Yellow Sea. Degraded and threatened habitats were identified, and an initial review of existing pertinent environmental policies and legislation in the countries was carried out. The PDF-B process resulted in the YSLME Project Document being submitted to the GEF Council in April 2000. The Project was approved; however several years of effort were required for the countries to agree on project staffing and the project office location. The project manager began in mid-September 2004, with the rest of the team selected in early 2005. A five-year project timeframe sets closure for the end of 2009.

1.3 PROBLEMS THAT THE PROJECT SOUGHT TO ADDRESS

As noted in the YSLME Project Document: The Yellow Sea is amongst the 50 largest marine ecosystems (LMEs) in the world, and has been one of the most significantly affected by human development. Today the Yellow Sea faces serious environmental problems, many of a transboundary nature, that arise from anthropogenic causes. There are six major metropolitan areas near the Yellow Sea (Qingdao, Tianjin, Dalian, Shanghai, Seoul/Inchon, and Pyongyang-Nampo) with tens of millions of inhabitants. These urban populations are dependent on the Yellow Sea as a source of marine resources for human nutrition, economic development, recreation, and tourism.

The Yellow Sea LME is an important global resource, supporting substantial populations of fish, invertebrates, marine mammals, and seabirds. Many of these resources are threatened by both land and sea-based sources of pollution and loss of biomass, biodiversity, and habitat resulting from extensive economic development in the coastal zone, and by the unsustainable exploitation of natural resources. Major changes in the structure of fisheries have resulted from non-sustainable fisheries practices. The three littoral countries, with their massive populations living in the Yellow Sea drainage basin, share common problems with pollution abatement and the control of municipal and industrial sites as well as contributions from non-point source contaminants from agricultural practices. All of the littoral countries are urgently seeking to address problems of reduced fish catch and shifts in species biomass and biodiversity, degradation of coastal habitats (caused by explosive coastal development), and effects of climate variability on the Yellow Sea Large Marine Ecosystem.

The objective of the project is to achieve 'Ecosystem-based, environmentally-sustainable management and use of the YSLME and its watershed'. This is to be attained by reducing development stress and promoting sustainable exploitation of the ecosystem in this densely populated, heavily urbanized, and industrialized region.

The Medium Term Objectives of the YSLME are:

- Enhanced national capacities in protection of marine environment and sustainable use of marine and coastal resources.
- Strengthened regional co-operation in marine environment protection and management.
- Increased cross-sectoral co-operation and co-ordination of relevant national institutions dealing with marine environmental management

In order to achieve these objectives, the project has been designed to

- (i) Prepare a Transboundary Diagnostic Analysis; based on the preliminary TDA undertaken during the PDF-B phase of the project. The TDA should identify threats to the Yellow Sea ecosystem and their root causes, and serve as the baseline for joint measures within a regional Strategic Action Plan to mitigate these threats.
- (ii) Prepare a regional Strategic Action Programme and National Yellow Sea Action Plans (NYSAPs). The SAP is expected to consist of a series of legal, policy and institutional reforms and investments to address the priority transboundary issues identified in the TDA. The SAP should include consideration of land and sea-based sources of marine pollution, degradation of critical habitats and over-fishing. The SAP is expected to include consideration of the costs and benefits of priority actions.

National Yellow Sea Action Plans are also expected, focusing on specific national level actions that will be taken in compliance with the agreed regional SAP.

- (iii) Initiate demonstration and pilot activities to facilitate implementation of the SAP. These activities should provide lessons and replication opportunities underpinning SAP implementation.
- (iv) Following completion of the TDA, SAP and NYSAPs, the Project is expected to initiate and facilitate SAP implementation.

2 FINDINGS AND CONCLUSIONS

2.1 PROJECT DESIGN: CLARITY, LOGIC, TIMING AND RESOURCE USAGE

The YSLME has been designed appropriately. The TDA/SAP structure utilised is quite common to the GEF International waters project portfolio and has a good track record of success in getting countries to work together to jointly address common water resource issues. The design emphasis is on confidence building, information sharing and capacity strengthening, which are all highly relevant to the Yellow Sea regional situation.

The YSLME in its planning stage (PDF-B) included an initial threats/problems analysis. The main project was then set up to further investigate and elaborate a TDA. The additional research and analysis that went into the TDA process helped to provide a more complete picture of ecosystem stresses in the Yellow Sea ecosystem and their root causes. Future project developers may want to consider carrying out the full TDA process at the PDF-B stage and then immediately launch demonstration projects and SAP development during the main project implementation.

The YSLME included expectations that the TDA and SAP could be completed within the first 3 years of the project, allowing 2 years of SAP implementation. This was then changed by the Project Steering Committee, allowing 4 years for TDA and SAP development. The revised schedule stands a reasonable chance of being achieved, as the drafting of the SAP has recently commenced, with the 1st draft SAP slated for completion in March 2008.

It is important to note that since approval of the Project Document, economic development in both China and ROK have continued to escalate, with accompanying increases in cost of living and increased costs to the YSLME Project. In addition, the Project Document was approved in 2000, yet the project implementation began only in 2005, with consequent escalation in operating costs. The budget established for the effort should still be sufficient to meet anticipated outputs and objectives, if the effort stays as a two-country initiative.

Should agreements be reached to expand the project to include DPRK participation, additional support will be necessary from China and ROK, and international donors. To that end a project proposal (Project Identification Form - PIF) has been developed and submitted to GEF for a medium size project (MSP) to integrate the DPRK into the Yellow Sea effort.

2.2 KEY ISSUES WITH RESPECT TO SPECIFIC COMPONENTS AND PROGRESS ACHIEVED, INCLUDING SCOPE, QUALITY AND SIGNIFICANCE OF PROJECT OUTPUTS TO DATE.

The YSLME essentially includes 5 sectoral components:

1. **Fisheries & Mariculture:** designed to develop regional strategies for sustainable management of fisheries and mariculture
2. **Biodiversity:** proposing and implementing effective regional initiatives for biodiversity protection
3. **Ecosystems:** including actions to reduce the stress to the ecosystem
4. **Pollution:** proposals and implementing actions to improve water quality and protect human health
5. **Investments:** to develop and pilot regional institutional and capacity building initiatives

There have been several iterations of the Project Implementation Plan, taking into account the passage of time between ProDoc development and project start-up. The expected outcomes have not been significantly altered although dates for activity completion have changed. The discussion below is built from the June 2007 Progress Implementation Report (PIR). The PIR is directly based from the initial Pro Doc elaboration of outputs, differing only by combining the above-listed components 3 & 4.

The **Fisheries Component** (F) involves 9 outputs, including: TDA development, SAP development, SAP implementation, Stock assessment report, Carrying Capacity Assessment, Mariculture Production, and Disease in mariculture, Regional agreements and national laws, and Fisheries Management. Most of the expected fisheries outputs are on schedule, with the notable exception of stock assessment activities tied to the cooperative cruise.

- The TDA process is complete. Initially planned for completion at the end of year 2, the PSC shifted this to year 3, and in fact it was completed early in year 3. The TDA holds minimal fisheries information; however the national data reports and regional synthesis report are more robust. A report on legislative gaps for fisheries was also produced.
- The draft SAP was initially planned for distribution by the end of 2007. Two meetings of the ad hoc SAP drafting group have been carried out. An analysis of fisheries agreements in the region has been done together with recommendations for a Yellow Sea fisheries agreement.
- A preliminary Stock Assessment report has been done, as well as regional guidelines for carrying out stock assessments. Follow on activities associated with the cooperative cruise remain to be carried out.
- The Regional Working Group on Fisheries suggested revising the Carrying Capacity Assessment expectations to focus specifically on mariculture. The PSC approved this suggestion. A workshop has recently been held (Sept 2007) to discuss progress in the region and an initial report was received on a suitable model for the estimation of mariculture carrying capacity in embayments around the Yellow Sea.
- A report on existing status and trends for Mariculture, also providing recommendations for a joint research programme has been completed. Demonstration projects are to be carried out in 2008 & 2009.
- The disease in mariculture outcome was grouped together with the Mariculture status and trends effort. The team set up an electronic web-based discussion group in 2006 but experts have not used it. There will be a workshop for disease control and prevention held in November, 2007.
- A report on regional fisheries agreements and national laws is nearing completion.
- The Fisheries Management Plan is scheduled for completion in project year 5.

The **Biodiversity Component** (B) similarly covers 9 outputs, many of which mirror the outputs in fisheries: TDA, SAP, SAP Implementation, Habitat Conservation, Vulnerable Species, Genetic Diversity, Introduced Species, Regulations, and regional Assessment / Regional Biodiversity Action Plan.

- The TDA process has concluded and there were national and regional synthesis biodiversity data provided.
- The SAP process is underway. The project was able to utilize the critical habitats identification work of the Yellow Sea Eco-region Planning Programme (YSEPP),

sponsored by WWF in collaboration with KORDI and the Korean Environmental Institute (KEI). It is expected that the YSEPP will continue to assist in narrowing the target list of sites for demonstration project sites. The Project is advertising for two biodiversity advisors to identify the representative habitats using the Ramsar classification. The consultants have been asked to shortlist the best examples of each habitat type according to the extent and integrity of the habitat, the continuity with other habitats and degree of human impact. A site in each country will be selected for demonstration activities after an analysis of the current management of habitats by local government.

- YSLME and YSEPP have teamed with the Panasonic company to implement biodiversity conservation in the Yellow Sea. Panasonic has indicated it will contribute \$1.8 million to the effort.
- There were expectations that a regional habitat conservation strategy would be developed by the end of project year 3 and at least 2 new protected areas identified by the end of project year 2. These indicators have not been achieved. A review of regional practices has been carried out. Habitat conservation is an extremely important, albeit very difficult issue along the Yellow Sea coast.
- The YSEPP effort has identified some 23 priority habitats for various species. The sites are widely configured and together cover virtually the entire Yellow Sea coast. Most of these areas are already faced with significant development pressures, from industrial and municipal development, and especially from aquaculture/mariculture and salt production. Interestingly, one of the most important habitat areas is the demilitarized zone between ROK and DPRK. This 'no man's land' is home to the least disturbed, most biodiverse area in the Yellow Sea region. There may be a unique opportunity over the next few years to preserve this habitat-rich area, through the YSLME effort as well as other initiatives, such as the DMZ Marine Peace Park, sponsored by the ROK Presidential Committee for Sustainable Development (PCSD). The YSLME Project Manager is a member of the International Advisory Group to the PCSD.
- Expectations were to conduct a national review in both countries on vulnerable species and then to develop and implement a regionally coordinated strategy for their protection. This effort has not proceeded. The project team expects to handle these expectations jointly with the habitat conservation strategy effort.
- Recommendations on conservation measures for preserving genetic diversity were expected. A regional workshop on the subject was held, during which experts concluded that the greatest threats to genetic diversity were reflective of the issues for biodiversity as a whole, namely: pollution, habitat loss, and over-exploitation. These are being covered in the SAP development now underway. Additional threats are from mariculture and restocking practices – which are being addressed in the Project's mariculture component. A database on genetic diversity is intended to be established and linked to other sites.
- No efforts have been done on the Introduced Species output – as the PMO indicated that another GEF project – GloBallast, executed through the International Maritime Organization (IMO), has developed an analysis on introduced marine species and has developed regulation and control recommendations. The project team is justified to let this effort be carried out through GloBallast, which included a regional pilot site in Dalian, China.

- The component includes the expectation for a regional assessment and regional biodiversity action plan, to include the signing of a regional biodiversity conservation agreement by the end of year 3. This will not happen. The regional assessment is underway and national assessments were done during the TDA process. It should be expected that some biodiversity actions will be included as part of the SAP.

The **Ecosystems Component** (E) includes: TDA & SAP development, Reduced Stressors to the Ecosystem, understanding of carrying capacity, understanding and control of contaminant inputs and levels, the monitoring and control of harmful algal blooms and emerging diseases, hot spot analyses, emergency planning and preparedness strategies, the development of legal and regulatory measures to counter pollution, and analysis of the fate and transport of pollutants. It is important to note that the project team for its planning and budgeting has divided this component into two parts: Ecosystems and a new **Pollution Component**. The change is welcome and provides for an improved clarity in activities.

- The SAP development effort in (E) includes an expectation that recommendations be developed for upgrading the regional monitoring network, and then to seek external funding for the network upgrade. This effort is expected to be completed by year 4.
- Expectations are that a carrying capacity study on primary productivity will be carried out at the end of 2007. The initial expectation was somewhat unrealistic in calling for carrying capacity to be included as an aspect of the countries' State of the Environment Reports for 2007. The project team has indicated within this activity set that the development of a new ocean colour algorithm for the Yellow Sea is underway, and a first round of surveys of plankton has been carried out.
- The project plans call for development and implementation of a strategy to assess and monitor contaminant and nutrient inputs and levels in the Yellow Sea. In particular, a regional QA/QC system should be established and then annual contaminant input reports published. Also, as noted above, a monitoring network upgrade is envisioned. These achievements have not yet been realized; however national pollution reports and a regional synthesis report were developed and a report on regional monitoring guidelines has been done. There is a significant level of sensitivity in the region regarding the gathering and sharing of pollution data, as a consequence, the participants of the Regional Working Group on Pollution agreed that data analyses rather than raw data, would be provided from both countries. This was a useful initial confidence building agreement that should hopefully set the stage for the routine exchange of monitoring data in the future.
- The process of developing and then using a joint regional monitoring network is likely to be very slow. In other shared water bodies where there is such sensitivity to sharing data, agreements have been reached to first expand the sharing of archived (dated) information
- HAB events have been documented. There is significant debate in the community over the attention given to HABs, and increasing recognition that HABs are not as high of a priority problem in the Yellow Sea as was perceived during the YSLME PDF-b project planning period. Increasing attention is being given to jelly fish populations, especially as they intrude further into Japanese waters (where they are not economically harvested).
- The TDA process has provided a bit of information for the hot spot analysis effort; however it is clear that this set of activities has not been carried out as originally intended. The expectation was to have technical reports done by year 2 and agreed

procedures by the end of year 3. The plans called for a ranking of hot spot sources, procedures for remediation, development of investment strategies and implementation of procedures. Given that these are essentially land based sources of pollution being discussed, the partner countries have viewed this output in national rather than regional focus. The identification of specific point sources has not been undertaken and there has been no prioritization of these sources. It is unlikely that the countries will agree to a more robust point source identification and prioritization effort to be included in the SAP. Nevertheless, the countries should be urged to delineate their national efforts at reducing point source discharges to the Yellow Sea, and to provide specific examples of the positive impact of increased regulatory enforcement.

- The ecosystem component also included development of a strategy for Emergency Planning and Preparedness. The partner countries have considered this a low priority – and of national rather than regional scope. It can be expected that very little progress will be made on a regional effort, other than to include some discussions of the subject within the regional SAP

The **Investment Component (I)** includes a variety of activities relating to economic analysis, institutional capacity building, stakeholder involvement and information management. There are 9 outputs:

- TDA
- SAP development
- SAP Implementation
- Stakeholder involvement in YELLOW SEA protection
- Enhanced Regional Coordination
- Strengthened National Institutions
- Sustainable Financial Institutions
- Data and Information Management
- Public Awareness and Information Campaign

The Project has been preparing **Guidelines for Cost-benefit Analysis of Management Actions**. This is a first attempt to develop guidance for GEF projects to incorporate economic aspects into environmental decision-making, in particular for SAP development. The Guidelines will provide theoretical background, methodology, and examples on how to measure impacts of conservation activities in terms of monetary value. Some previous GEF projects have introduced economic data in their SAP-development; however there have been no standardized analytical procedures in place. The Guidelines should not only help assess the economic impact of recommended management actions for the Yellow Sea, but also serve as guidance for economic analyses in other GEF projects.

Governance Analyses, covering stakeholder, institutional and legislation/policy issues have been developed. National analyses were conducted in China and ROK in 2006. The combined regional governance analysis was then put together in 2007, based on the findings of the national analyses and additional inputs. The national analyses have contributed to TDA development, while the regional analysis supports SAP preparation. GEF IW projects typically include analyses on stakeholders, legislation and institutions. With these governance analyses, the YSLME has effectively linked these aspects.

The YSLME has developed a **Public Awareness Strategy**. It emphasises joint activities with other regional partners, rather than focusing just on project-specific activities. Its implementation depends very much on the cooperative efforts of the **Yellow Sea Partnership**, which the project developed in response to the Pro Doc expectation to

establish a network of local, national and regional stakeholders to provide input into the SAP development. The Yellow Sea Partnership has expanded now to 20 local, national and international government and private organisations. The Partnership has a web site up and running, and coordinated activities are underway, including:

- A set of joint public awareness activities with NOWPAP.
- A joint education and public awareness program implemented by the Global Village, a major NGO in China.
- A teaming arrangement between YSLME and the Shangdong local government to protect the Kong Dong Island, an important fisheries area. The YSLME has signed an MOU with Shandong, and relevant actions will soon start. A private company, the Oriental Ocean, will cover the major costs of this effort.
- Additional stakeholder activities include two NGO workshop held in Korea with 30 participants each; 1 Yellow Sea partnership workshop held with 20 participants; 1 parliamentary seminar held with 20+ participants; and perhaps 40 or more NGO's participating as observers at RWG, RSTP and PSC meetings. The YSLME PMO has also continues to discuss with PSC members how to increase the involvement of NGO's in the PSC.
- Two youth programmes, one each in ROK and PRC have been completed, a local government training workshop was held with 20+ participants and a university internship was initiated.
- A small grants programme has been carried out. Six small grants were carried out in 2006 and six in 2007. During 2006, small grants were awarded for public awareness activities carried out by:
 - Liaoning Ocean and Fishery Department (LOFD) China: Educating the Public on ecosystem protection and management around the northern Yellow Sea area. More than 3,800 students participated in activities organized by the LOFD in Dandong, China, including environmental education classes, drawing competition, shoreline debris cleanups and fish releases into the estuary of the Han River.
 - Citizens Institute for Environmental Studies (CIES) ROK: Program for exchanging information and experience about reclamation work among local communities in the west coast of Korea: For a Sustainable Yellow Sea. The CIES conducted two workshops for local residents focused on the environmental and economic development issues relevant to tidal flats.
 - Shihwa Lake Saver, Korea: Marine environmental education course for school teachers and youth groups in the Shihwa lake Region
 - Global Village of Beijing, China: Welcome to the green Olympics and protect the Yellow Sea surrounding us.
 - Haimen Ocean and Fisheries Bureau of China: Liyashan oyster reef ecosystem protection
 - Dalian maritime University: Community based conservation of coastal ecology in Dalian.

The project timeline initially included having NYSAPs approved by the governments prior to the end of year 3. The PSC considered this sequence and decided to alter the plan, so that the regional SAP would be drafted prior to the development of NYSAPs. As a consequence, the drafting of NYSAPs is expected to commence in early 2008, as the regional SAP takes

form. The decision to revise the process of NYSAP and SAP development is logical and should help to ensure that national strategy development is carried out within the parameters being defined in the regional SAP. The setting of national and regional plans needs to be an iterative approach – whereby national plans comply with regional agreements, while regional agreements get developed taking existing national strategies and treaty obligations into consideration.

The project team should come up with a regional data and information management (DIM) strategy and implement it. There is concern at the PMO that many databases already exist in the region and globally, that are designed to harness oceanographic information. The team has expressed interest not to duplicate other database development efforts but rather to serve as a repository and linking mechanism that enables interested persons to gain access to the Yellow Sea information of interest. So the current plan is to gather and store the data being generated through the project, and then to utilize a web-accessed meta-database system that links to a wide variety of data sources. So far, a database of nationally collected data is in progress and the meta-database is under development, with the management of the database outsourced. This DIM strategy is logical and holds out promise as a template for other LME and regional seas efforts.

The project web site is relevant, well organized, and informative and kept up to date. Also included in the promotional efforts has been the launch of the YSLME Partnerships website. The Partnership site remains a work in progress, as other partners have so far not paid too much attention to it and content is weak.

2.3 EXTENT OF COOPERATION AND SYNERGY GENERATED AT NATIONAL AND LOCAL LEVELS AND NATURE / EXTENT OF COUNTRY COMMITMENT

Interviews with government officials in China and ROK suggest that country buy-in at the national level is in evidence, but could be improved. Project interest and involvement is strong amongst middle-level officials, especially at the marine science focused ministry departments and agencies. As an example, both of the National Project Coordinators (Li Haiqing of China and Hyung-Tack Huh of ROK) attended the Yellow Sea Science Symposium in Hangzhou. It is also noteworthy that in China, the YSLME team was requested to share their implementation experiences with a UNDP/GEF country-level project, serving as a model for effective project implementation.

The MTE mission provided evidence that attention is needed to expand project awareness and commitment amongst government ministries that are not directly responsible for the project, but are otherwise central to natural resource management and protection. In particular, it was evident that the State Environmental Protection Administration (SEPA) of China has had minimal involvement in the project, despite their central role in dealing with land based sources of pollution.

Synergies and cooperation have varied at and between national and local levels. The project has successfully brought local and regional officials into the process, although at this stage the local government participation has been limited – focused in a couple of areas in both countries – and linked (in China) with the small grants programme. Strong interest has been indicated from the PMO and key stakeholders to continue and broaden local government participation. The expanding role of local governments in decision-taking on coastal development issues in China and Korea means that they are on the front lines of ecosystem protection.

Across the more than 40 interviews carried out during the mid term evaluation, there were varying levels of awareness of the project and varying opinions on its achievements, yet there was unanimity on its importance. Stakeholders fully realise that economic development and the population surge taking place around the Yellow Sea periphery represent grave threats to this vital marine ecosystem and fishery unless concerted action is taken. It is clear to the national and local government officials, NGOs and marine scientists interviewed, that the YSLME represents an important opportunity to bridge historical and resource competition-driven barriers between the Yellow Sea countries.

2.4 FUNCTIONALITY OF INSTITUTIONAL STRUCTURE, ROLE OF PSC, RSTP, NATIONAL COMMITTEES AND WORKING GROUPS

The YSLME is directed by a project steering committee (PSC), and there are a regional scientific and technical panel (RSTP) and regional working groups (RWGs). There is significant overlap within these three bodies nevertheless they are successfully carrying out expected functions. It can be noted that in addition to the area-specific RWGs, an ad-hoc RWG has been established to focus specifically on drafting the SAP. These institutional arrangements are appropriate. There have been a variety of GEF International Waters projects designed to develop TDAs and SAPs. Some have utilised an RWG approach, others have taken a regional 'Centres of Excellence' approach. It can be seen from the YSLME experience and from other IW projects, that the RWG approach is more flexible, and more productive in getting international collaboration.

The RWGs were formed as planned, meet as scheduled and are performing their intended functions. Turnover has been low on the Chinese side, higher amongst Korean experts. A concern voiced on the Korean side has been the low financial benefit to work group participation. Some work group participants requested compensation for meeting attendance in addition to the provided per diems. It was discussed and agreed that the project will not provide consultancy fees for attending meetings. Co-financing sources from the participating governments will need to be utilised if this continues to be an issue in either delegation.

Internal coordinating mechanisms established through the project have been nominally effective. Most International Waters TDA-SAP projects include an expectation to establish interministerial coordinating mechanisms. Rarely is this effectively carried out, and usually the internal governmental communications are handled through existing structures – be it through the Cabinet of Ministers, or an existing water resources intergovernmental structure. The YSLME is no exception. Intergovernmental coordination in both China and Korea is handled on an ad hoc, as needed basis. Observations from the evaluation mission suggest that the Chinese State Oceanic Administration (SOA) and State Environmental Protection Administration (SEPA) have not been closely cooperating on the YSLME project. The key Korean agencies, Ministry of Maritime Affairs and Fisheries, (MOMAF) and Ministry of Foreign Affairs and Trade (MOFAT) appear to be working together constructively.

2.5 IDENTIFICATION AND QUANTIFICATION OF ADDITIONAL OUTPUTS AND OUTCOMES BEYOND PRODOC

The YSLME project team together with key stakeholders have successfully built interest and support amongst parliamentary officials in China and Korea. More than 50 persons from the two countries, including 14 parliamentarians, attended a YSLME sponsored regional conference on the sustainable use of marine resources in the Yellow Sea. The event was held in Qingdao China in March 2006. This reportedly marks the first time that a GEF

International waters project has sponsored a conference specifically for parliamentarians. The event was very well received by the participants and there is interest to continue and broaden the discussions. Expectations are for a follow on exercise to take place in October 2007 in Korea.

A small grants program was added to the project during implementation. This decision by the Project Steering Committee to add a small grants program builds on the recognition across GEF projects that small grants are a useful mechanism for NGO development and public awareness raising. The \$110,000 made available has been used in 2006 and 2007 to award grants to 6 recipients each year.

2.6 PROGRAMMATIC AND FINANCIAL VARIANCES / ADJUSTMENTS TO DATE, THEIR CONFORMITY TO PSC DECISIONS AND APPROPRIATENESS TO PROJECT OBJECTIVES.

The only major variance at this stage has been an underutilization of the project budget, stemming in particular from the lack of partner country approval for the cooperative cruise. Negotiations for the cruise continue and have been characterized by the project team as close to completion. The PSC has supported the PMOs efforts to negotiate an agreement between the parties, and to retain funds in the budget for this activity.

2.7 PROJECT COORDINATION, MANAGEMENT AND ADMINISTRATION BY THE PMO:

Generally high marks should be given for PMO administration, management and project coordination. The Project team is technically experienced, works well together and has had minimal turnover. Project management has been sensitive to the delicate process of building confidence between the participants from PRC and ROK. Project management has also handled well the sensitive issue of DPRK participation. One area where the PMO has itself recognized a deficiency is in the area of public awareness raising and communications.

Some concerns were raised during the evaluation concerning the fee balance that should be struck concerning consultancy services. In particular, the issue arose over payment for data collection services in preparation for the TDA. On the one hand, concerns were raised in China that there is twice the amount of China's Yellow Sea coastline than for ROK, so consultancy assignments for data collection to Chinese experts should reflect this size differential. On the other hand, Korean cost of living has been higher than for China, suggesting higher consultancy rates for ROK data collectors. PSC discussions led to both sides agreeing to keep payments balanced. All subsequent consultancy assignments have been through open bidding and bid reviewers take into account cost and size discrepancies in the decision process. To date, the consultancy fee disbursements have been fairly evenly balanced.

2.8 ORGANIZATIONAL/INSTITUTIONAL ARRANGEMENTS FOR COLLABORATION AMONG THE VARIOUS AGENCIES AND INSTITUTIONS INVOLVED IN PROJECT ARRANGEMENTS AND EXECUTION

There are essentially six partners in the international management circle for the YSLME: GEF secretariat (Washington DC); UNDP headquarters (New York), UNDP GEF regional office (Bangkok), UNDP – Beijing; UNDP-Seoul, and UNOPS (Copenhagen). During project implementation, and on a day to day basis, the PMO looks to UNOPS for budgetary/financial issues, to the UNDP/GEF regional office (and then UNDP headquarters) for technical support, and then occasionally to the country UNDP offices for some logistical support. The

PMO team is very experienced and can work well within this arrangement. The project team has benefited from UNOPS budget management, in particular with the flexibility to utilise an impress account. The extent of implementing and executing agency oversight has been generally fine during the TDA process.

It may be useful for the UNDP country offices to play a more direct supportive role once a draft SAP is under consideration for approval by the countries. SAP efforts in this and other regions have encountered long delays during the approval process, so it is crucial that the PMO, Steering Committee members, UNDP country offices and national implementing agencies cooperate on a strategy to achieve rapid consideration, negotiation and approval of the SAP. The UNDP country offices should consider supporting the SAP process in the following ways:

- Help to ensure harmonisation between on-going UN-supported projects in the region and SAP recommended actions by disseminating the draft SAP to related UN project managers for comment.
- Assist the efforts of the project team and national counterparts (SOA and MOMAF) through written correspondence, urging each government to swiftly consider and approve the draft SAP.
- Help sponsor and attend the ministerial SAP signing meeting, including participation by the Resident Representatives.
- Work with the PMO, implementing national agencies and funders (including GEF) to identify opportunities, and write up concept notes, for follow on assistance to help with SAP and NYSAP implementation. This should include new objectives and outputs for the UNDP China Country Programme, and for the DPRK country programme, (when reactivated, and assuming DPRK joins the YSLME effort).

2.9 EFFECTIVENESS OF THE MONITORING MECHANISMS CURRENTLY EMPLOYED BY THE PMO IN MONITORING ON A DAY TO DAY BASIS, PROGRESS IN PROJECT EXECUTION

The PMO is well organised with respect to progress monitoring. The PMO operates based from a project implementation plan and annual work plans, and uses an internal budgeting process that mirrors the UNOPS Atlas system yet connects disbursements to specific project outputs and activities from the PIP. A Microsoft Project-based Gantt chart has been developed and is used to track work schedules and expected milestones. Attention has been paid to updating the plans on an annual basis as part of an effective adaptive management programme. The PMO CTA carries out annual job performance evaluations based on the UNDP/UNOPS established criteria.

2.10 FINANCIAL MANAGEMENT OF THE PROJECT, INCLUDING THE BALANCE BETWEEN EXPENDITURES ON ADMINISTRATIVE AND OVERHEAD CHARGES IN RELATION TO THOSE ON THE ACHIEVEMENT OF SUBSTANTIVE OUTPUTS

The project budgeting process has encountered some difficulties with respect to overestimating planned annual budget expenditures. This has made it difficult for UNDP and UNOPS to plan for annual expenditures to the Yellow Sea Project and has complicated disbursements for other UNDP/UNOPS implemented projects in the region.

The total project budget for fisheries is \$1,881,406, of which approximately \$254,000 has been spent to date. The fisheries budget for 2007 is \$630,994, with \$22,144 so far spent (3.5%), and another \$10,000 identified in contracts payable. The largest 2007 planned allocation in fisheries is for contractual services, yet none of the \$418,372 has yet been spent. A second large unspent pocket of funds, \$256,372, is reserved for rental of the ship for the cooperative cruise, and \$120,000 of the contractual services budget has been earmarked for performing regional stock assessments as part of the cruise activities. Since the cruise is on hold, it is understandable that some of these funds have not been utilised. With respect to the other fisheries activities, "training on disease diagnosis, prevention and control" recently took place (16th & 17th of September, 2007) and not yet reflected in the budget, and an expert exchange is planned for October – November 2007. All that remains is the hiring of a Mariculture advisor. Subtracting out the cooperative cruise costs, half of the fisheries budget for 2007 has not been spent. This suggests a recalibration of the budget for 2008, with an opportunity to use these funds for additional demonstrations and small grants.

The biodiversity area includes an expectation that \$75,000 will be utilised each year 2007 – 2009 (\$225,000 total) for institutional contracts to implement a regional strategy for conservation areas. The 2007 allocation has so far not been utilised and there are no indications of planned expenditures for these activities during the remaining months of 2007. This planned budget expenditure fits within the annual work plan, objective II, Output IIA, Activities 2 & 3, which set expectations to develop regionally coordinated strategies of conservation and restoration of habitat and for the protection of vulnerable species (2006 – 2007), and then to provide inputs to the SAP by October 2007. Hopefully, revised timetables and planning for these activities are under discussion during the September 14 Biodiversity Working Group meeting.

There are similar albeit less pronounced under-spending issues for 2007 in the other output sets. At the end of July, 33% of the 2007 PMO internal budget had been spent, 24% of the biodiversity budget, 23% of the investment outputs budget, 11% of the ecosystem budget, and 7% of the pollution budget. It is normal for projects to spend a significant portion of annual expenditures in the last half of the year, especially with PSC and working group meetings and many workshops scheduled in the fall. Nevertheless it is important to pick up the pace now, as the project is at the halfway point and 71% of the budget remains to be utilised. The end of 2007 and early portions of 2008 are crucial for planning future spending, especially on demonstration projects.

There have been a few budget revisions that are not directly reflected in PSC agreements; however these have been mostly money movements within object/output frames and have not materially changed project expectations.

There was a change from the 2006 Atlas budget to the revised budget (2007.05.23) allocating an additional \$300,000 to the miscellaneous expenses category of the PMO activity budget (see Atlas # 745000). Nevertheless, only \$4,105 has been spent under this category, following a rising set of expenditures from \$3,250 in 2004, \$4,698 for 2005 and \$16,738 for 2006. Also, roughly \$860,000 that was previously apportioned to local consultant costs (71300) was reallocated to IP Staff payroll costs and miscellaneous expenses. Some of this adjustment can be explained by the hiring of an international staff person to handle fisheries issues. Yet the internal project ("shadow") budget shows that much of the underutilised funding under the PMO output area is earmarked for PMO cross-components – and in particular for 'contingencies'. The PMO should provide clarification on the rationale for this increase in contingency earmarking.

The PSC approved budget for the YSLME identifies US \$7.3m out of a \$14.3 m total budget for project administrative costs. These include a wide array of expenditures for: PMO staff salaries, travel, office space and supplies, PSC and RSTP meetings, scientific conferences, evaluation and UNOPS supervision costs. Through the end of July, 2007 the project had spent \$2.9 million on PMO and cross-component items, out of \$4.2 million in total expenditures (69%). The high percentage of funding going towards administrative items requires correction through increased spending on substantive outputs. With the SAP process moving forward, the PMO soon to launch demonstration projects, and the cooperative cruise back on the agenda, an increase in spending on substantive outputs should be expected.

The administrative (PMO / cross-component) budget for the YSLME appears excessive - 50% of total expenditures – mostly because too many items that could be listed as substantive outputs are grouped as administrative items. In particular, the YSLME budget lumps all staff salaries and travel expenses together as administrative costs when in fact most PMO technical expert time and travel are for substantive work addressing specific project outcomes. In recent years, UNDP/GEF budget guidance has stressed greater accuracy and less spending allocated to administration. Expert staff salaries, travel costs and workshops should be apportioned to the specific project outputs and activities for which they are intended to be used; leaving the PMO administrative budget only for truly back office and cross-component items (e.g. office and supplies, secretarial support, audits and evaluations, reporting and management oversight). With the advice and consent of UNOPS, the PMO should now consider revisions to the YSLME budget to realign substantive and administrative costs for the duration of the project.

2.11 QUALIFIED ASSESSMENT OF THE EXTENT TO WHICH PROJECT OUTPUTS TO DATE HAVE SCIENTIFIC CREDIBILITY

As seen from the Project Document and TDA, there is an abundance of reliable secondary data for the YSLME. There are also very competent scientists from China and the ROK working on the project. Nevertheless, two issues were evident during the evaluation that should be addressed by the PSC. One problem is that practically all the studies done to date have been confined to either Chinese waters or to ROK territorial waters. The end result is that the data from these studies are often not directly comparable, mainly because they are carried out at different times (or seasons) and use different methods. More opportunities should be investigated – including the cooperative cruise, to better harmonise sampling methodologies and analysis techniques, through joint studies.

A second key issue is the involvement and retention of top scientists. For China, top scientists from the SOA and the universities appear to be participating; however there is very limited participation from relevant agencies like SEPA and MOA. Fortunately, the turnover rate of Chinese scientists on the project Working Groups has been very low. For the ROK, there has been a wider array of institutions involved, yet Working Group participant turnover has been high. The problem of scientist retention in Korea is blamed on insufficient professional and financial incentives. The project is not engaged in basic scientific discovery and scientists from the ROK are not given time off or additional compensation for their involvement, so some scientists have lost interest. Despite these concerns, it should be pointed out that the quality of scientists presently participating in this project is high (at least, based on the quality of papers and discussions at the Open Science Meeting in Hangzhou).

The depletion of fisheries resources was the major reason for the initiation of this Yellow Sea LME Project. Yet, the sensitivity related to fisheries data has meant that serious questions

remain on the changes occurring in fisheries biomass. It appears that the project emphasis has been changing - from fisheries resource management to less sensitive issues – such as waste (nutrient) discharge impacts on plankton.

2.11.1 TRANSBOUNDARY DIAGNOSTIC ANALYSIS (TDA)

The TDA is one of the two principal products/outputs of the YSLME Project:

“The centrepiece of the GGEF strategy Is the concept of ‘strategic joint fact finding’ as a means of arriving at a consensus on what actions are needed to establish threats ... collaborating states establish technical teams that work to establish a common baseline of facts and analysis of the problem in the form of a transboundary diagnostic analysis (TDA), which is then used to set (national) priorities for actions to address threats to international waters in the form of the SAP.”

Although the TDA was written by an external consultant (Dr. J.M. Bowers), it summarises the works of the numerous project scientists involved in four Working Groups (Pollution, Ecosystem, Fisheries and Biodiversity). The quality of the TDA is thus a good reflection as to the scientific creditability of the Project.

The TDA is a useful general document, providing an overall assessment of the current health of the Yellow Sea ecosystem and focusing on a causal chain analysis of key risks and issues of concern. The TDA is not especially data rich. For instance, there are no statistics given in the pollution section indicating findings from the monitoring of land based sources or from river discharge. The TDA identifies an interesting relationship regarding escalating nitrogen levels in the Yellow Sea along with lowering phosphorous and silicate levels. The reduction in silicates, in particular, has been linked (but not proven) to conditions amenable to increasing dinoflagellate blooms.

The TDA indicates a significant development problem: 30% of the mud foreshores of the Yellow Sea have been lost over the past 30 years because of increased mariculture plus agricultural and salt production uses. This constitutes around 880,000 ha of reclaimed mud flat areas, including 37% if the intertidal areas along the China coast and 43% of the mudflats along the ROK coast. The TDA includes an analysis of biodiversity priority areas developed by the YSEPP (WWF, KORDI and KEI) The 23 selected priority areas encompass much of the Yellow Sea coastal area, and have been identified because of their importance as habitats for birds, fish, molluscs, plants and algae.

A major component of the TDA is Causal Chain Analysis and Analysis of Root Causes:

“The causal chain analysis provides a basis for identifying options for management intervention. Such options for intervention, to reduce or rectify a given problem, exist in relation to each cause of the problem from immediate cause through secondary, tertiary and quaternary causes to the root cause as shown in Figure 1 (in the TDA). “

The reason a fifth Working Group (Investment) was added to the Project relates to the following TDA comment:

“However, it generally takes longer to develop a systematic and commonly-agreed forma of intervention to address root cause because it can only be developed within a policy framework. This is one of the primary reasons why the development of the Strategic Action Programme is a process that must engage all stakeholders including politicians.”

Since there is now an emphasis on working at the lower trophic levels (concentration on nutrients and plankton), it is useful to note that the TDA recognises there remain significant

data and information gaps concerning phytoplankton, zooplankton, benthos and harmful algal blooms. Indeed, during the Open Science Meeting in Hangzhou there was considerable discussion about phytoplankton blooms, red tides and the extent to which the Yellow Sea has a harmful algal blooms (HAB) problem.

A scientific discussion on the HAB issue is beyond the scope of this evaluation exercise, and this issue is being extensively debated within the YSLME ecosystem working group. Here it is useful just to clarify the HAB and red tide terminology. According to UNESCO/IOC, in some areas the term “red tide” is used to describe all phenomena in which the water is discoloured by high algal biomass. This term is potentially misleading because it includes many blooms which discolour the water but cause no harm, and ignores blooms of high toxic cells that cause problems at very low (and essentially invisible), cell densities. As a result, many bloom events which are harmless end up having negative impacts because skittish consumers avoid purchasing or eating seafood which is perfectly safe, or tourists and residents avoid using beaches because of mistaken concern over swimming safety. The term harmful algal bloom (HAB) is now used by scientists and government officials in most countries to describe the subset of these phenomena which are toxic or cause harm.

Some findings that have been put forward through the working groups and at the Yellow Sea marine science symposium, suggest there are anomalies in the results from the two countries that require further analysis. For instance, historical data show a trend of increasing planktonic biomass in Korean coastal areas, with a decreasing trend along the China coast. The difference in plankton distribution and its trends has been highlighted in the TDA. It must be realised that these differences (between the Chinese and Korean studies) are to be expected:

- The studies were carried out in different location. The YSLME is not a homogeneous water body. There are different currents (and thus different water masses) and this is complicated by stratification in the winter months (mainly due to freshwater runoff).
- “Patchiness” is a very characteristic feature of plankton distribution so that even if studies are carried out at the similar sites (even at the same time), the results may be very different (perhaps unless there has been very intensive sampling).
- The methods used are often different. As pointed out in the TDA, different size plankton net meshes were employed.

A pulse-modulated chlorophyll fluorescence measurement system has been purchased and will be used for primary productivity studies. This is encouraging (and an incentive) to the scientists on the Project to get a chance to work with state of the art equipment. It will also encourage good scientific discussions between scientists of the two Countries involved fostering real collaboration and trust. There are however a number of caveats in using the pulse-modulated chlorophyll fluorescence instrument for primary productivity studies:

- One of the problems when measuring phytoplankton productivity is deciding on which method to employ. Traditionally three methods are commonly used (each with their only pros and cons): the dissolved oxygen light- and dark-bottle technique, the radioactive carbon-14 technique and the chlorophyll method (either by measuring the extracted pigments or through chlorophyll fluorescence). To overcome the patchiness problem, a combination of methods is necessary for any comprehensive study.
- The relatively simple dissolved method requires incubating bottles for a period of time (usually half a day or a whole day) and it measures respiration as well as both net and

gross productivity. Its main disadvantage (apart from the need for a long incubation period) is that it is not accurate in oligotrophic waters.

- The technically complex carbon-14 method also requires incubation (anywhere from half an hour to twelve hours for the) but is very accurate. Unfortunately, there is a problem as to whether net or gross productivity is being measured (the shorter the incubation period, the closer to gross productivity and the longer the incubation period, the closer to net productivity).
- With the chlorophyll/fluorescence method, it is possible to take a large number of samples (covering long transects and at different depths. The disadvantage of this method is that it is not a direct measure of productivity. It has to be calibrated against either the dissolved oxygen or carbon-14 method to be really useful.
- With the pulse-modulated fluorescence method, whilst there is no incubation, there is a need to dark-adapt the chlorophyll (phytoplankton) for about half an hour. This means that the number of samples become limited since measurements cannot be taken in situ (as with the non-modulated older fluorescence system). [Quote from: John A. Raven, John Beardall (2006): Chlorophyll fluorescence and ecophysiology: seeing red? *New Phytologist* 169 (3), 449–451. “*Chlorophyll fluorescence data as a proxy of biomass in situ must clearly be interpreted with caution.*”]
- One other alternative is to do the primary productivity correlation in real time with satellite sensing of chlorophyll a. This is cheaper and covers a wider area (the whole of the Yellow Sea) than can be done with an in situ profiling fluorometer. There is however a need to coordinate the ground measurements with satellite passes

The Causal Chain Analysis / Analysis of Root Causes in the TDA indicates that the most frequent root cause for the environmental problems in the Yellow Sea is “Development being undertaken with limited comprehensiveness and coherence of the legislative base for environmental and biodiversity protection coupled with poor enforcement and inadequate public information”. This differs from the second most frequent entry by the inclusion of the additional words “... and inadequate public information”. Thus, the most frequent root cause appears no less than eighteen times. Furthermore, the root cause “Inadequate balance between development and environmental protection policy” has much similarity to this major root cause, bringing the total entries for this class of root cause to no less than twenty-one.

- It is clear that these root causes have more to do with “governance” than a lack of scientific understanding. Thus, if the analyses have been correctly carried out, the emphasis on the next steps in this Project should reflect the need for expertise in the governance area. The emphasis should switch from natural science to social science, with policy makers, local officials and parliamentarians, NGOs and other stakeholders (e.g. fishers and those from land-based industries) becoming more involved. This is critical for the formulation as well as implementation of the National and regional SAPs.

China has indicated it will reduce fish catch/production by 30% as of 2020, and will reduce nutrient loading by 10% every 5 years starting from 2007. These are ambitious targets, especially given the continuing rapid expansion of the coastal population in China. Verifying achievement of these self-set targets will be a major challenge. The target reductions in wild fisheries catch will also likely increase pressure to expand mariculture production. China has indicated its interest to expand offshore rather than coastal mariculture production. Yet in all likelihood, pressures on coastal water quality and wildlife habitat will continue to rise.

Some fisheries research suggests that fisheries biomass in the Yellow Sea may be transitioning from fin fish dominated to jelly fish dominated. The implications for this

transition (“fishing down the food chain”) are significant to humans and the entire Yellow Sea marine ecosystem. Reducing nutrient discharge and fisheries catch can directly contribute to solving the problem; however actions need to be grounded in science. Unfortunately, sensitivities over fisheries has so far limited joint research that could gauge the extent of this biomass transformation. Benthic community studies and investigations of sea sediment also appear to be delicate subjects for joint research.

2.12 LESSONS DURING PROJECT IMPLEMENTATION

There are many positive lessons to take away from the first 2.5 years of YSLME activity, including the effective establishment and operations of supervisory and technical teams. These are crucial bodies for project success, especially to ensure that projects stay relevant and achievable within policy and political constraints. There are effective supervisory and advisory structures in place for the YSLME, including the PSC, RSTP and the ad hoc SAP working group. The effectiveness of these committees bodes well for future achievements, and serves as an example to future projects. The key learning involves effective meeting management and due diligence in attracting and retaining top experts.

It was unfortunate that the project inception was kept on hold for over three years while negotiations proceeded on CTA and office location selection. In future situations where there are two parties to a project at loggerheads on such management issues, it is important to quickly identify a face-saving solution that allows the project to move forward. Agreements could have been made to rotate the office location over the course of the project, and to have one country fill the CTA post while the other country selects a deputy CTA. It creates unneeded stress to project implementation when the project cycle gets drawn out over such issues.

The Yellow Sea cooperative cruise serves as a cautionary tale. While it should be expected that the YSLME cooperative cruise will finally launch, its difficult and prolonged development offers lessons for future LME and Regional Seas projects. Project developers should consider lowering the sensitivity threshold by arranging for a series of smaller scale joint at-sea activities, each covering a specific marine aspect and/or sea area, and involving a small number of researchers from each country. The point is to make the exercise a normal, unremarkable aspect of joint research efforts.

2.13 MID-TERM PERFORMANCE RATINGS

The evaluation team was requested in the evaluation TOR to rate various criteria from the project at its mid point, based on a five-step system: 1 – 5, (1= highly satisfactory, the project has greatly exceeded expectations and is utilising adaptive strategies that improve on ProDoc expectations; 2 = quite satisfactory, the project is meeting ProDoc expectations, with some notable achievements; 3 = satisfactory, the project is meeting or close to meeting expectations, with any deficiencies largely beyond project management control, 4 = marginally satisfactory, the project is not meeting expectations, with significant gaps to be bridged during the remaining project period, and 5 = unsatisfactory, the project is failing to achieve key activities and immediate interventions are necessary to get the project back on track).

The ratings set out below are necessarily subjective, yet based on consideration of project achievements to date, and taking into consideration similar GEF/IW projects. The ratings recognise that at a project’s mid-term it is quite early to measure many criteria – such as cost effectiveness, sustainability and impact, so the ratings serve as a prediction of what may happen based against current achievement levels and trends.

Rated Criteria	Rating	Comments
1. Achievement of objectives and planned results	2	The project is moving in the right direction, with the TDA process completed and SAP under development. The PIP revised some ProDoc expectations – in particular with respect to timing of SAP implementation. Adaptive management has been reasonably applied.
2. Attainment of outputs and activities	3	Most outputs and activities are well underway. The fulfilment of outputs such as a cooperative cruise and fisheries management plans are delayed – largely due to factors beyond PMO control.
3. Cost-effectiveness	3	It is difficult to determine cost effectiveness even at the conclusion of many confidence and capacity building projects. Here at mid-term, positive signs include the expansion of in-kind and direct support from the private sector (Panasonic, Amway, etc).
4. Impact	3	The YSLME The YSLME has had limited impact on the environment and on policy and legislative development in the ROK and China; however at the project mid-term, with a SAP still under development, it is early to expect achievement on these elements. There is real potential for impact once the SAP is developed. Indirect impacts already can be mentioned with respect to improving bilateral relations between officials and scientists involved in the project.
5. Sustainability	2	Sustainability is a difficult criterion to gauge at the project mid term. Interest has been building in both China and ROK on forming a YSLME Commission and Secretariat. Geopolitical and economic resource issues continue to limit the pace and scope of the partnership, however there is a real potential for future enlargement of the project to include DPRK and generate subsequent donor support.
6. Stakeholder participation	2	Public and NGO involvement has in some cases been weak – but this reflects national realities more than project deficiencies. High marks are given for the PMO efforts to involve parliamentarians and local government officials. The participation of private sector interests is developing, with some notable successes in getting companies to support public awareness and education activities.
7. Country ownership	3	The implementing agencies in both countries appear firmly committed to the effort. There is active participation in the PSC, RWGs and RSTP. Greater awareness and involvement of other agencies and institutes is desirable – especially to ensure SAP approval and implementation.
8. Implementation approach	1	The PMO has made significant process in building towards achievement of the YSLME aims despite long-standing geo-political tensions in the Yellow sea area. Project management has struck the right tone and approach – pushing for activities to be accomplished, yet cognizant of national sensitivities. The Yellow Sea Partnership can develop into an effective mechanism for coordinating Yellow Sea activities and for expanding public awareness and support for ecosystem protection measures. The PMO is well-managed with an effective team in place.
9. Financial planning	3	The PMO has made very good use of local / regional expertise. It has been able to conserve its resources during the early project period – which provides financial flexibility for expanded use of demonstration projects and possible support to DPRK. Improvements are needed in annual budgeting, as the PMO has been overestimating its planned annual budget expenditures during the first several project years,

		which has the carry-on effect of complicating disbursements for other UNDP/UNOPS implemented projects in the region.
10. Replicability	3	The project's efforts to involve parliamentarians are already the subject of an IW LEARN Experience Note, used for recommending successful project activities to other GEF projects. Some of the ideas being discussed for demonstration projects may hold good potential for replication (for example on polyculture/mariculture).
11. Monitoring and evaluation	2	Monitoring and evaluation efforts are in line with UNDP and GEF requirements. The PMO has paid close attention to budgeting and financial aspects. The project has been closely monitored by UNOPS and the UNDP – Seoul office. An independent audit was commissioned and was taking place simultaneous to this MTE.

2.14 PROGNOSIS OF THE DEGREE TO WHICH THE OVERALL OBJECTIVES AND EXPECTED OUTCOMES OF THE PROJECT ARE LIKELY TO BE MET

SAP projects stand a greater likelihood to meet expectations when involved stakeholders represent both scientific and policy leadership. The YSLME has so far been primarily a discussion amongst scientific experts, which is especially relevant for the TDA development process, but is not ideal for ensuring passage of the SAP, which constitutes a binding legal document between governments, and requires effective implementation at national and local levels. YSLME SAP development plans call for an expansion of stakeholder inputs into the SAP process during late 2007 - early 2008, including local government involvement. It should also be expected that follow-on meetings of the parliamentary group will focus on the SAP recommendations. Opportunities should also be identified for involving other stakeholders in the SAP-draft commenting process.

The YSLME will be viewed as a successful project if a regional SAP can be developed, approved and implemented. Based on the activities and achievements to date, there is reason for cautious optimism, mixed with a sober awareness of the challenges still to be overcome. There is steadfast interest amongst the parties to achieve SAP approval. China and ROK laboured for 15 years to get to this point, and there is momentum towards a positive conclusion. Government officials in both countries appear keen to address environmental issues, and upcoming events, like the 2008 Beijing Olympics, should keep worldwide attention riveted on the region's environmental challenges. The high calibre talent included in the ad hoc SAP drafting group is certainly capable of drafting a well-conceived SAP. However, based on past precedent, negotiations on the final content of the SAP may be drawn out and contentious, especially if verifiable indicators and monitoring procedures are included for gauging implementation success.

3 RECOMMENDATIONS

1. To build a case for continuing GEF support, China and Korea should strive during 2008 to move quickly to negotiate and approve the YSLME SAP, setting verifiable targets for protecting the Yellow Sea ecosystem and restoring its fisheries. The SAP should include a regional fisheries agreement. To counter natural government tendencies toward drift and delay, it will be useful to carefully choreograph the SAP drafting, negotiating and signing processes. The PMO and the ad hoc SAP RWG are already hard at work on SAP formulation; however several suggestions may be useful to consider:
 - Push for a quick negotiation and approval process for the SAP. Even before the SAP is fully drafted, seek an upfront commitment from each country that they will conclude their negotiations and approve the SAP in 2008. This timing is crucial for successful implementation of the YSLME and for consideration of a GEF follow-up support effort. It may be that a joint memorandum of understanding between the governments and the PMO can help to cement their commitment.
 - Hold several stakeholder consultations for January, through March 2008 so that NGOs, private sector organisations and the general public have a chance to comment prior to final drafting. The Yellow Sea Partnership may be a useful umbrella for these stakeholder review efforts.
 - The ad hoc drafting group is expected to release a draft of the SAP in March, 2008. Already a head of time the PMO should develop terms of reference and select consultants to elaborate costs and benefits, as well as policy and legislative considerations. These supporting documents should be completed by the end of May 2008, so that a full package of the SAP and supporting documentation is submitted to each government at the start of June, giving three months for internal review procedures.
 - The SOA and MOMAF should identify senior level officials to lead final negotiations during September of 2008, to clarify all remaining issues, and agree on the wording of an accompanying joint statement and agreement for the SAP. These officials should have high level authority to negotiate, which means that other ministries have had a chance previously to provide input.
 - A ministerial level meeting and signing ceremony could then be scheduled for early November, 2008, timed to coincide with the annual YSLME PSC meeting and perhaps an NGO or science forum. The PMO and PSC should seek to get the ministerial meeting date set early in the year – to reinforce the urgency of completing the drafting and negotiation process. The PSC should aim to make this a major, high publicity event.
2. The initial PIP expects that demonstration projects should await SAP completion. This will not work within the project time constraints and is not necessary. Already at this stage in the SAP drafting it is becoming clear what are the subject areas that would benefit from demonstration efforts (e.g. mariculture, coastal wetlands and habitat protection, the management of marine protected areas, etc.). Planning for demonstrations should start immediately after agreement is reached at the upcoming 2007 Project Steering Committee.

3. The health of fisheries in the Yellow Sea was a critical driver for launching the YSLME project. The partner countries have demonstrated a willingness to set national targets for reduced fisheries catch, and to establish bilateral agreements for working together to solve the problem. These are encouraging signs; however difficulties in achieving effective cooperation are evident in the fact that fisheries research has been removed from the cooperative cruise. Now with the SAP being drafted, and demonstration projects soon to be developed, the time is ripe for a significant increase in joint fisheries activities. In particular, attention should be given to gauging the extent that species displacement is occurring in the Yellow Sea, with finfish biomass being supplanted by jelly fish.
4. There appears to be a strong mutual interest between China and Korea to improve mariculture management – both to increase fish quality and health, and also to reduce pollution loading. Demonstration sites and types of techniques, including polyculture, should be identified during the final months of 2007, with one or more demonstrations tendered in early 2008. The partner countries, together with the YSLME PMO have a great opportunity during the next two years to expand knowledge and undertake training on innovative mariculture techniques, to increase production while reducing disease and pollution. The long history and extensive production of mariculture in the yellow sea coupled with increasing demands in a densely populated region suggest that this is an ideal location for such demonstrations. The YSLME can have a positive global impact in this field.
5. A high priority within the expected biodiversity project outputs is to develop coordinated strategies of conservation and restoration of habitat and the protection of vulnerable species. The project has established an effective relationship with the YSEPP consortium to identify priority areas for habitat protection. A useful next step will be to identify one or two particular sites and demonstrate effective coastal zone management techniques.
6. The TDA recognises the importance of instituting marine protected areas to enhance habitat for threatened species of flora and fauna. The TDA notes that there are a number of Marine Protected Areas (MPAs) established around the coastal areas of China and Korea. Many of these areas have been designed to provide for multiple uses, including both habitat and also coastal development, in particular aquaculture, mariculture, and salt production. The mixed use of MPAs is certainly common, and reasonable recognising the population densities in the area. The problem is that very few of the MPAs have established habitat protection baselines that enable the MPA managers to identify when development has surpassed the ‘carrying capacity’ or “limits of acceptable change” of the ecosystem and needs to be cut back or curtailed. The project could play a valuable role in its demonstration phase to assist in the establishment of baselines and management strategies in at least one MPA in each country. The results should then be shared and replicated with the other MPAs in the respective countries.
7. The discussions and presentations at the 1st Yellow Sea Research Symposium (August 2007, Hangzhou) included consideration of various techniques to gauge the carrying capacity of the Yellow Sea ecosystem. There are expectations across many of the YSLME project outputs – fisheries, biodiversity, ecosystems and investments, to undertake carrying capacity analyses. There is a risk that the project will expend lots of resources for capacity analyses in each of the focal areas and yet arrive no closer to concrete recommendations for improving the Yellow Sea ecosystem. In particular, there

is a significant risk that a lack of verifiable data on the status of the Yellow Sea ecosystem will ensure a large margin of uncertainty, rendering the carrying capacity analyses useless as an aide to policy decision-making. It is suggested to restrict the carrying capacity effort to demonstration scale, utilising selected small sites in both countries where human – species interactions and impacts can be closely monitored, sufficient data can be gathered, and an iterative process can be employed.

8. The small grants in the YSLME commenced as an additional activity not specifically budgeted within the ProDoc. As such, it has had limited funding and each year's continuation funding depends on approval from the Project Steering Committee (PSC). The budget was set at \$100,000 and revised to \$110,000. The awards have taken place and there is no expectation for future funding. However, there are lots of opportunities for YSLME public awareness raising, there is continuing value in supporting local environmental NGOs, and there will be demonstration projects identified as part of SAP implementation. The PSC should give serious consideration to earmarking an additional \$100,000 for another round of small grant funding, and to utilise the additional funds for public awareness, educational opportunities, habitat protection efforts, etc. linked to the demonstration programme. This type of targeted small grants effort could significantly raise the prominence of the demonstrations while building a local constituency and support base to increase the chances these demonstration activities can be sustained and replicated after the YSLME concludes.
9. The project has made significant progress in its public awareness efforts and is on the right track with the Yellow Sea Partnership, which can help to systematise and improve the efficiency of regional public awareness campaigns focused on Yellow Sea ecosystem protection. It will be important now for the other YS Partners to see this initiative as also benefiting their specific activities and interests, so that it becomes more of a mutually shared effort, and less of a YSLME directed effort.
10. Future Yellow Sea Partnership activities should continue to expand private sector support mechanisms, such as those already developed with Panasonic on the EESP, with AMWAY on the Laioning youth programme, and with Oriental Ocean Company and Shandong Province for the Kong Dong Island protection effort.
11. Through the YSLME website and supported by the Yellow Sea Partnership, the PMO should pay greater attention to opportunities for expanding the body of published works on the Yellow Sea ecosystem, helping to raise the profile of Yellow Sea marine scientific efforts.
12. The PSC may want to consider adding a communications expert for the PMO. This person would take direct responsibility for public relations, web content, special events, educational programmes, the Yellow Sea Partnership and the small grants programme. Given current spending levels, and available unused contingency funds, such a position should fit within the existing budget. Alternatively, one or both of the partner countries could second a communications expert to the effort, perhaps on a rotating basis.
13. The YSLME Project Steering Committee should request a concept note by the end of 2008 from the PMO that sets out the costs and benefits and management mechanisms for establishing a Yellow Sea Commission and Secretariat. This would allow consideration for the option to be included in the SAP. A Commission can enable the

partner countries to normalise their joint efforts and provide a long term repository for bilateral and multilateral financial support.

14. It is vital to the long-term sustainability of the Yellow Sea ecosystem that the DPRK becomes a partner in this regional effort. Recent events have set the stage for enlargement of the YSLME partnership in the near term. In particular, during the just concluded summit between the leaders of the two Koreas, confidence building agreements were reached, some of which directly involve the Yellow Sea. For instance, a joint ROK/DPRK fishing area in disputed yellow sea waters was announced, as well as joint use of some shipping routes. Positive progress in the separate six nation nuclear talks adds further impetus to the timeliness of engaging now with DPRK on Yellow Sea management issues. In addition, China and DPRK are now jointly proposing a GEF IW project on sustainable management of the Yalujiang River, serving as another instance of water resource cooperation that should spur DPRK involvement in the YSLME Project
 - This recommendation to now involve the DPRK is built upon a regional consensus that has been developing concerning their participation. The DPRK has indicated to the PMO its interest to participate, and both Chinese and ROK officials have signalled their desire for the DPRK to join.
 - The DPRK has been invited to send participants to the November 2007 PSC annual meeting and participation is likely. A key issue that may determine the level of participation is whether they are invited as observers or as future partners. It would be very useful for UNDP, China and ROK to signal that this meeting sets the stage leading to full DPRK participation in 2008.
 - During its November meeting, the YSLME PSC should consider the budget and management implications of DPRK involvement. The PMO should be instructed to draft up a revised PIP and budget, identifying likely new activities and related costs. Additional funding from China and ROK, as well as external funders, will be required. A project concept note should be developed and used to attract international financial support. The GEF and other international funders should then be approached.
 - There is currently a freeze on direct UNDP support to DPRK, pending resolution of an (unrelated) investigation into financial management issues at UNDP's DPRK country office in Pyongyang. While this investigation places some restrictions on the YSLME, it should not prohibit the commencement of partnership negotiations. The YSLME is a regional UNDP/GEF project, executed through UNOPS, not through the UNDP country offices. Significant financial support to DPRK for YSLME-related demonstration projects and consultancies will require a signed agreement for YSLME involvement, as well as resolution of the UNDP–Pyongyang office financial issues. In the meantime, limited support – for travel allowances of DPRK officials to participate in YSLME negotiations, should be made available.
 - GEF has received an MSP PIF (project proposal) to provide support for inclusion of the DPRK into the Yellow Sea Project. The PIF provides a good basis for GEF financial consideration, noting that a \$1 million GEF commitment would enable the DPRK to fully integrate into Yellow Sea Project activities. The PIF estimates \$815,000 in co-financing, through in-kind contributions of office space and expert time in the DPRK, and through bilateral support from China and other external sources. GEF approval of this proposal in 2008 would provide a strong boost to the YSP.

- The UNDP/GEF International Waters Programme is designed to protect and enhance natural resources through transboundary cooperation. It is hoped that through the joint sustainable management of shared natural resources, the parties will also build greater trust and reduce cross-border conflicts. Establishing a successful three-way partnership in the YSLME will be a crowning achievement for the project, and a strong basis for subsequent GEF financial support for protection of the Yellow Sea ecosystem.

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4.2 MEETINGS - UNDP/GEF-YSLME MTE MISSION, 6 – 23, AUGUST 2007

6 August 2007 (Monday - Seoul Korea)

Zhe Yang, UNDP Representative, UNDP Seoul, ROK

Hyun-Shin Lee, Programme Manager, UNDP Seoul

7 August 2007 (Tuesday - Beijing China)

Zang Jianzhi, Senior Engineer, Senior Programme Officer, China GEF Office

Guo Yenfeng, Programme Manager, Energy & Environment Team, UNDP Beijing,

8 August 2007 (Wednesday - Beijing China)

Wang Songlin, Marine Programme Officer, WWF China, Beijing,

Tobai Sadayosi, Marine Programme Leader, WWF Japan

Yuan Jun, Director, Int'l Financial Institution Division IV, Int'l Dept, Ministry of Finance, Beijing, China, YSLME National Project Coordinator (+ colleagues)

Zhou Qiangwu, Division Chief, 4th Division, Dept. of Int'l Cooperation, Ministry of Finance

9 August 2007 (Thursday - Beijing China)

Liang Fengkui, Director, Div. Int'l. Organizations Dept. Int'l Cooperation State Ocean Administration, Beijing, China.

Pei Xiangbin, Deputy Division Chief, Ocean Dept. State Environmental Protection Administration (SEPA)

10 August 2007 (Friday - Dalian, China)

Yihang Jiang, Programme Manager, YSLME PMO

Wen Quan, Research professor, National Marine Environmental Monitoring Center, Institute of Marine Environmental protection, SOA, Dalian. Chairperson of YSLME Regional Pollution Working Group

Wang Juying, Senior Scientist, NMEMC

Lin Xinzhen, International Cooperation Officer & Project Manager, NMEMC

11 August 2007 (Saturday- Dandong China)

Sun Yaquan, Dandong City Administration

Meng Dexing Liaoning Provincial Government, Marine Environment Research Institute

Wang Xinian, Marine Environment Research Institute, Liaoning Provincial Government

Cathy Wang, Liaoning Branch Senior Manager, AMWAY

12 August 2007 (Sunday - Dandong & Dalian China)

Liaoning Province - YSLME - AMWAY Youth Programme

13 August 2007 (Monday - Dalian, China)

Han JiaBo, Deputy Director, Ocean and Fisheries Science Research Institute of Liaoning Province.

14 - 16 August 2007 (Tuesday- - Thursday, Hangzhou China)

Li Haiqing, National Project Coordinator - China

Hyung-Tack Huh, National Project Coordinator - ROK Fellow, Sr. Scientist - Emeritus, Agriculture and Science Division, Korea Ocean R&D Institute, Korean Academy of Science and Technology

Sinjae Yoo, Sr Scientist, KORDI, ROK.

Zhang Kai, Global Village, China.

Jingmei Li, Professor, Ocean University of China, School of Economics

Zhu Ming Yuan, Research Professor, First Institute of Oceanography, SOA, Key Lab of Marine Ecology and Environment Science and Engineering

Zhang Jianzhi, Senior Engineer, Senior Programme Officer, China GEF Offices, Beijing

Seong Hwan Pae, Environment Technology, PhD, Korea Institute of Marine Science and Technology Promotion

Anatoly N. Kachur, Director, UNEP Action Plan for the North-western Pacific (NOWPAP)

(+ numerous other participants at the First Open Science Meeting from China, ROK, Japan, US and other GEF International Waters Project)

20 August 2007 (Monday - Seoul Korea)

Chang-Mo Kim, Director, Environment Cooperation Division, Ministry of Foreign Affairs and Trade (MOFAT), ROK

Dong-Shik Woo, Director, Marine Environment Division, Ministry of Maritime Affairs and Fisheries (MOMAF), ROK

Jong-Gil Je, Parliamentarian, National Assembly, ROK

21 August 2007 (Tuesday - Seoul Korea)

Suam Kim, Professor, College of Fisheries, Sciences, Pukyong National University

Daeseok Kang, Assistant Professor, Department of Ecological Engineering, Pukyong University

Yihang Jiang, Programme Manager, YSLME Project Management Office, KORDI, ROK.

Connie Chiang, Environmental Officer, PMO

Jeong-Soo Kim, Vice Director, Citizens' Institute for Environmental Studies, ROK

Kyung Won Kim, Director, Wetlands Center, Korea Federation of Environmental Movement (KFEM), ROK.

Sun-Mi Park, Head of Shihwa Lake Saver

22 August 2007 (Wednesday - Seoul Korea)

Hi-II Yi, Principal Research Scientist, Ocean Environment & Characteristics Research Division, Marine Environment Research Department, Korea Ocean Research & Development Institute (KORDI)

Connie Chiang, Environment Officer, PMO

Isao ENDO, Investment & Public Awareness Officer, PMO

Mark Walton, Fisheries Officer, PMO

23 August 2007 (Thursday - Seoul Korea)

Yihang Jiang, Programme Manager, PMO

Sung- Jun Park, Finance & Administrative Officer, PMO

Eui-Dea Yun, IT Supporting Staff, PMO

Kyung-Suk Lee, Administrative Assistant, PMO

Zhe Yang, UNDP Representative, UNDP Seoul

Hyun-Shin Lee, Programme Manager, UNDP Seoul

4.3 UNDP/ GEF PROJECT MID-TERM REVIEW TOR

1. PROJECT BACKGROUND

Among the 50 large marine ecosystems (LMEs) in the world ocean, the Yellow Sea LME has been one of the most significantly affected by human development. Today the Yellow Sea faces serious environmental problems, many of a transboundary nature, that arise from anthropogenic causes. Approximately 600 million people (nearly 10% of the world's population) live in the basins that drain into the Yellow Sea. Large cities near the sea having tens of millions of inhabitants include Qingdao, Tianjin, Dalian, Shanghai, Seoul/Inchon, and Pyongyang-Nampo. People of these large, urban areas are dependent on the Yellow Sea as a source of marine resources for human nutrition, economic development, recreation, and tourism. The Yellow Sea receives industrial and agricultural wastes from these activities.

The Yellow Sea LME is an important global resource. This international waterbody supports substantial populations of fish, invertebrates, marine mammals, and seabirds. Many of these resources are threatened by both land and sea-based sources of pollution and loss of biomass, biodiversity, and habitat resulting from extensive economic development in the coastal zone, and by the unsustainable exploitation of natural resources. Significant changes to the structure of the fisheries has resulted from non-sustainable fisheries, reducing catch-per-unit effort. A fisheries recovery plan is essential to the continuation of the exploitation of this important resource. The three littoral countries, with their massive populations living in the Yellow Sea drainage basin, share common problems with pollution abatement and control from municipal and industrial sites in the Yellow Sea basin, as well as contributions from non-point source contaminants from agricultural practices. All of the littoral countries are urgently seeking to address problems of reduced fish catch and shifts in species biomass and biodiversity (caused in part by overfishing), red tide outbreaks, degradation of coastal habitats (caused by explosive coastal development), and effects of climate variability on the Yellow Sea Large Marine Ecosystem. The objective of the project is: Ecosystem-based, environmentally-sustainable management and use of the YSLME and its watershed by reducing development stress and promoting sustainable exploitation of the ecosystem from a densely populated, heavily urbanized, and industrialized semi-enclosed shelf sea.

2. PROJECT OBJECTIVES AND EXPECTED OUTPUTS

The long-term objective of this project is ecosystem-based environmentally-sustainable management and use of the Yellow Sea and its watershed: reducing development stress and promoting sustainable development of the ecosystem from a densely populated heavily urbanized and industrialized semi-enclosed shelf sea.

In order to achieve this objective this project will prepare a Transboundary Diagnostic Analysis (TDA), a regional Strategic Action Programme (SAP) and National Yellow Sea Action Plans (NYSAPs). This project will also initiate and facilitate the implementation of the SAP.

The project is relevant to the GEF Operational Strategy for International Waters, as well as for the Waterbody Based Operational Programme (#8), with relevance to biological diversity.

3. MID-TERM REVIEW OBJECTIVES

The purpose of the Mid-Term Review is to examine the performance of the project since the beginning of its implementation. The Review will include both the evaluation of the progress in project implementation, measured against planned outputs set forth in the Project Document in accordance with rational budget allocation and the assessment of features related the process involved in achieving those outputs, as well as the initial and potential impacts the project. The evaluation will also address the underlying causes and issues contribution to targets not adequately achieved.

The Mid-term Review is intended to identify weaknesses and strengths of the project design and to come up with recommendations for any necessary changes in the overall design and orientation of the project by evaluating the adequacy, efficiency, and effectiveness of its implementation, as well as assessing the project outputs and outcomes to date. Consequently, the Review mission is also expected to make detailed recommendations on the work plan for the remaining project period. It will also provide an opportunity to assess early signs of the project success or failure and prompt necessary adjustments.

The Review mission will also identify lessons learnt and best practices from the Project which could be applied to future and other on-going projects.

4. SCOPE OF THE MID-TERM REVIEW

The scope of the mid-term evaluation will cover all activities undertaken in the framework of the project. The evaluators will compare planned outputs of the project to actual outputs and assess the actual results to determine their contribution to the attainment of the project objectives. The evaluation will diagnose problems and suggest any necessary corrections and adjustments. It will evaluate the efficiency of project management, including the delivery of outputs and activities in terms of quality, quantity, timeliness and cost efficiency. The evaluation will also determine the likely outcomes and impact of the project in relation to the specified goals and objectives of the project.

The evaluation will comprise the following elements.

- i. Assess whether the project design is clear, logical and commensurate with the time and resources available;
- ii. A summary evaluation of the project and all of its major components undertaken to date and a determination of progress towards achievement of its overall objectives;
- iii. An evaluation of project performance in relation to the indicators, assumptions and risks specified in the logical framework matrix and the Project Document;
- iv. An assessment of the scope, quality and significance of the project outputs produced to date in relation to expected results;
- v. An analysis of the extent of co-operation engendered and synergy created by the project in each of its component activities, between national and regional level activities and the nature and extent of commitment among the countries involved;
- vi. An assessment of the functionality of the institutional structure established and the role of the Project Steering Committee (PSC), the Regional Scientific and Technical Panel (RSTP) and national committees and working groups;
- vii. Identification and, to the extent possible, quantification of any additional outputs and outcomes beyond those specified in the Project Document;
- viii. Identification of any programmatic and financial variance and/or adjustments made during the first 2 years of the project and an assessment of their conformity with decisions of the PSC and their appropriateness in terms of the overall objectives of the project;
- ix. An evaluation of project coordination, management and administration provided by the PMO. This evaluation should include specific reference to:
 - x. Organizational/institutional arrangements for collaboration among the various agencies and institutions involved in project arrangements and execution;
 - xi. The effectiveness of the monitoring mechanisms currently employed by the PMO in monitoring on a day to day basis, progress in project execution;
 - xii. Administrative, operational and/or technical problems and constraints that influenced the effective implementation of the project and present recommendations for any necessary operational changes; and
- xiii. Financial management of the project, including the balance between expenditures on administrative and overhead charges in relation to those on the achievement of substantive outputs.
- xiv. A qualified assessment of the extent to which project outputs to date have scientific credibility;
- xv. An assessment of the extent to which scientific and technical information and knowledge have influenced the execution of the project activities;
- xvi. A prognosis of the degree to which the overall objectives and expected outcomes of the project are likely to be met;

- xvii. Lessons learned during project implementation;
- xviii. Recommendations regarding any necessary corrections and adjustments to the overall project workplan and timetable for the purposes of enhancing the achievement of project objectives and outcomes.

5. REVIEW METHODOLOGY

The Mid-term Review will be conducted in a participatory manner working on the basis that its essential objective is to assess the project implementation and impacts in order to provide basis for improvement in the implementation and other decisions.

The Mission will start with a desk review of project documentation and also take the following process:-

- (i) Desk review of project document, outputs, monitoring reports (such as Project Inception Report, Minutes of all Steering Committee meetings including other relevant meetings, Project Implementation Report (PIR/APR), Quarterly Operational Reports, quarterly progress reports, mission reports and other internal documents including consultant and financial reports and relevant correspondence);
- (ii) Review of specific products including datasets, management and action plans, publications and other material and reports;
- (iii) Interviews with the Project Manager and other project staff in the Project Management Office (PMO); and
- (iv) Consultations and/or interviews with relevant stakeholders involved, including government representatives in PR China and ROK; local communities, NGOs, private sector, donors, other UN agencies and organizations.

6. REVIEW TEAM

Two consultants with the following qualifications shall be engaged to undertake the evaluation working concurrently according to the planned schedule, and one of the international consultant will be designated as the team leader who will have the overall responsibility of organizing and completing the review, and submitting the final report.

Qualifications of Team Leader:

- International/regional consultant with academic and/or professional background in natural resources management and extensive experience in coastal ecosystem, marine science and international water etc. A minimum of 15 years' relevant experience is required;
- Substantive experience in reviewing and evaluating similar technical assistance projects, preferably those involving UNDP/GEF or other United Nations development agencies and major donor;
- Excellent English writing and communication skills; demonstrated ability to assess complex situations in order to succinctly and clearly distill critical issues and draw forward-looking conclusions;
- An ability to assess the institutional capacity and incentives required;
- Understanding of political, economic and institutional issues associated with transboundary water and large marine ecosystem in the Yellow Sea;
- Experience in leading multi-disciplinary and multi-national teams to deliver quality products in high stress and short deadline situations;
- Excellent in human relations, coordination, planning and teamwork.

Qualifications of International Consultant:-

- International/Regional consultant with academic and/or professional background in natural resources management, especially in the areas of coastal ecosystem, marine science and international water etc.
- A minimum of 15 years' relevant experience is required;
- Experience in implementation of technical assistance projects;
- Skills in international water (Large marine ecosystem) assessment techniques;
- Knowledge and experience in coastal ecosystem planning;
- Experience and skills in biological diversity monitoring and information systems;
- Excellent English writing and communication skills;
- Excellent in human relations, coordination, planning and team work.

7. PROPOSED SCHEDULE

The Review will take place in [tentative date] 2007 and it requires [tentative number of days]-day desk review, [tentative number of days]-day country visit to PR China and ROK and the Project Management

Office, another [tentative number of days]-days for consultations with various stakeholders. The draft Final Report should be submitted to UNDP & UNDP/GEF for circulation to relevant agencies within [tentative duration for draft] weeks after the completion of the review. The Review Team will finalize the report within two weeks upon receiving comments and feedbacks from stakeholders compiled by UNDP & UNDP/GEF. Detailed schedule will be prepared in due time by UNDP & UNDP/GEF in consultation with the Project Management Office.

8. DELIVERABLES

The Review mission will produce the following deliverables to UNDP, UNDP/GEF and the Project Steering Committee:

- An executive summary, jointly prepared by the consultants, including findings and recommendations;
- A detailed evaluation report covering items (i) – (xiv) of 4. Scope of the Mid-Term Review with attention to lessons learned and recommendations; and
- List of Annexes prepared by the consultants, which includes TORs, Itinerary, List of Persons Interviewed, Summary of Field Visits, List of Documents reviewed, Questionnaire used and Summary of results, Co-financing & Leveraged Resources etc.
- The report together with the annexes, shall be written in English and shall be presented in electronic form in MS Word format.

9. ESTIMATED COSTS

The total cost for the Review Mission is estimated at USD48,000, which includes consultant fees, their daily subsistence allowances, as well as international and domestic air fares.

10. RATING PROJECT SUCCESS

The evaluators may also consider the form of the rating used in the International Waters Program Monitoring Questionnaire prepared by the GEF Monitoring and Evaluation Unit. This will be provided to the consultants by the Project Manager at the inception of the review.

The evaluation will rate the success of the project on a scale from 1 to 5, with 1 being the highest (most successful) rating and 5 being the lowest. The following items should be considered for rating purposes:

- Achievement of objectives and planned results
- Attainment of outputs and activities
- Cost-effectiveness
- Impact
- Sustainability
- Stakeholders participation
- Country ownership
- Implementation approach
- Financial planning
- Replicability
- Monitoring and evaluation

Each of the items should be rated separately with comments and then an overall rating given. The following rating system is to be applied:

- 1=Excellent (90 % -100 % achievement)
- 2=Very Good (75 % - 89 %)
- 3=Good (60 % - 74 %)
- 4=Satisfactory (50 % - 59 %)
- 5=Unsatisfactory (49 % and below)