PROJECT BRIEF

1. IDENTIFIERS

PROJECT NUMBER	
PROJECT NAME	**Regional (China, Republic of Korea): Reducing Environmental Stress in the Yellow Sea Large Marine Ecosystem**
DURATION	5 years
IMPLEMENTING AGENCY	UNDP
EXECUTING AGENCY	UNOPS
REQUESTING COUNTRY	People's Republic of China and Republic of Korea
ELIGIBILITY	Eligible to receive UNDP technical assistance and participation in the restructured GEF: PRC - 16 May 1994; ROK - 3 May 1994;
GEF FOCAL AREA	International Waters
GEF PROGRAMMING FRAMEWORK	GEF Operational Strategy for International Waters, as well as for the Waterbody Based Operational Programme (#8), Large Marine Ecosystem component

2. SUMMARY

Is: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.

3. COSTS AND FINANCING (US$)

GEF:	- Project	13.328
	[administrative cost is:]	1.066
	- PDF	.350
	Subtotal GEF	**14.744**
Co-Financing:	Government	8.914
	UNDP	1.388
	Subtotal Co-financing	**10.302**
Total Project Cost:		**25.046**

4. Associated Financing (US$)-BASELINE: $162,063,857

5. GEF Operational Focal Point Endorsement(s)

People's Republic of China
Mr. Yang Jin Lin
GEF Operational Focal Point
Ministry of Finance
Dated: 5 March 2000

Republic of Korea
Mr. Choi Jai-Chul
Director of Environment Cooperation Division
Ministry of Foreign Affairs and Trade
Dated: 6 March 2000

6. Implementing Agency Contact

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List of Acronyms/Abbreviations

ADB	Asian Development Bank
APEC	Asia-Pacific Economic Cooperation Forum
CD	Compact Disc
CCRF	Code of Conduct of Responsible Fisheries
DIM	Data and Information Management
DPRK	Democratic People's Republic of Korea
EAS	East Asia Seas GEF Project
EIA	Environmental Impact Assessment
FAO	Food and Agricultural Organization
GEF	Global Environment Facility
GIS	Geographic Information System
GOOS	Global Ocean Observing System
GPA	Global Programme of Action for the Protection of the Marine Environment from Land-based Activities
HAB	Harmful Algal Bloom
IMO	International Maritime Organization
IOC	Intergovernmental Oceanographic Commission
IW	International Waters
LEARN	Learning Exchange and Resource Network
NEAP	National Environmental Action Plan
NFP	National Focal Point
NGFPA	National Government Focal Point Agencies
NGOs	Non-Governmental Organizations
NYSAP	National Yellow Sea Action Plans
NOWPAP	Northwest Pacific Action Plan
PCU	Project Coordination Unit
PDF	Project Development Fund
PIP	Priority Investment Portfolio
PIR	Project Implementation Review
PPER	Project Performance and Evaluation Review
PRC	People's Republic of China
QA	Quality Assurance
QC	Quality Control
ROK	Republic of Korea
SAP	Strategic Action Programme
SC	Steering Committee
SGP	Small Grants Program
SMC	Strategic Management Advisory Committee
SOA	State Oceanic Administration
TDA	Transboundary Diagnostic Analysis
TOR	Terms of References
TPR	Tri-partite Review
TRADP	Tumen River Area Development Project
UNCLOS	United Nations Convention on Law of the Sea
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNOPS	United Nations Office for Project Services
WWW	World Wide Web
YSLME	Yellow Sea Large Marine Ecosystem

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BACKGROUND AND CONTEXT

INTRODUCTION

1. For millennia the Yellow Sea ecosystem provided food and livelihood to the civilizations in East Asia. Shallow but rich in nutrients and resources, the Yellow Sea is most favorable for coastal and offshore fisheries, and its waters are the highway for vast international shipping activity.

2. Three countries (Democratic People's Republic of Korea - DPRK, People's Republic of China - PRC, and Republic of Korea - ROK) share the natural heritage of the Yellow Sea. Despite their political and social diversity, the people of the region express a common concern for the Yellow Sea. Today the Yellow Sea faces serious environmental problems, many of a transboundary nature, that arise from anthropogenic causes. The three countries of the region are confronting difficult economic and administrative adjustments that complicate environmental management and natural resource protection efforts. The three littoral countries share common problems with pollution abatement and control from municipal and industrial sites in the Yellow Sea basin, as well as contributing non-point source contaminants from agricultural practices. All of the them are urgently seeking to address problems of reduced fish catches (caused in part by overfishing), red tide outbreaks, degradation of coastal habitats (caused by intensive coastal development), and effects of climate variability on the Yellow Sea Large Marine Ecosystem (YSLME).

3. In few other enclosed or semi-enclosed seas are multilateral measures for marine pollution control so deficient as in the Yellow Sea. However, there now are opportunities for improvement. Both ROK and PRC acknowledge that threats to the commons from pollution and overexploitation of living resources could have serious, perhaps irreversible, economic consequences. China, DPRK, and ROK have to decide how to adjust national initiatives to be compatible with emerging international legal and technical obligations, or, conversely, the extent to which each state wishes to ignore or deviate from international practice.

4. There is also a lack of a formal infrastructure to bring about international collaboration and cooperation in monitoring and research activities on YSLME shared marine resource issues. The lack of a formal structure prevents the development of well-coordinated cooperative resource assessments, baseline studies and coordination in emergencies (such as a massive mammal die-off, or a spill of oil or of other toxic hazardous materials). Monitoring and research programs are not as effective as they should be because they stop at disputed governmental borders rather than at some ecosystem or natural boundary. Effective studies of transboundary contamination and living marine resource assessments require excellent coordination, cooperation, and synchronization of sampling, analysis, and interpretation to enable integration of data across the region.

5. An objective of the project is to implement an ecosystem-based management approach to reduce development stress on the ecosystem, and to initiate recovery actions leading to the long-term sustainability of the environment and resources of the YSLME.

ENVIRONMENTAL ISSUES

6. The Yellow Sea is the 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 km^2 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.

7. The Yellow Sea is connected to the Bo Hai Sea in the north and to the East China Sea in the south, thus 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.

8. 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.

9. Although primary productivity is important as a fundamental property of an ecosystem, no reasonable large-scale estimates are available for the Yellow Sea. Existing estimates based on local measurements vary from 68~320 g C m^{-2} yr^{-1} (Yang, 1985; Choi et al, 1988; Chung and Park, 1988). The primary productivity of the Yellow Sea seems to vary widely depending on the location and season.

10. The phytoplankton populations are composed mainly of neritic diatoms. The dominant species are Skeletonema costatum, Coscinodiscus, Melosira sulcata, and Chaetoceros. Their composition shows a distinct seasonal shift. Blooms occur in late winter to early spring, and summer to early autumn, and are concentrated to the southern coast of Liaoning and Shandong and the coast of Jiangsu. The bio-mass in the northern region and the southern region in the sea is 2460 x 10^3 cells$\cdot m^{-3}$ or cells/m^3 and 950 x 10^3 cells$\cdot m^{-3}$ or cells/m^3, respectively, lower than that of the Bo Hai and East China Sea .

11. The benthic bio-mass in the northern Yellow Sea Cold Water Mass and the southern Yellow Sea is 41 g/m^2 and 20 g/ m^2, respectively. Out of the total benthic bio-mass, mollusks are most important (about 50 percent), echinoderms second (about 20 percent), polychaetes third (about 11 percent), and crustaceans fourth (about 9 percent). Among these bottom animals, most are important food sources in the Yellow Sea ecosystem, and some are commercially important species (e.g., fleshy prawn, southern rough shrimp, and Japanese squid).

12. The fauna of resource populations in the Yellow Sea are composed of species groupings associated with various ecotypes, such as warm water species, warm temperate species, cold temperate species, and cold water species. Warm temperate species in the Yellow Sea fauna are the major components of the bio-mass and account for more than 70 percent of the total abundance of resource populations; warm water species and boreal species account for about 10 percent. The fauna in the Yellow Sea are recognized as a sub-East Asia province of the North Pacific Temperate Zone. Because most of the species inhabit the Yellow Sea year round, the resource populations in the fauna have formed an independent community.

13. Fish are the main living resource and 276 fish species are found. Of these, 45 percent are warm water forms, 46 percent warm temperate forms, and 9 percent cold temperate forms. The number of species of crustaceans is relatively small—only 54 species—of which warm water and boreal forms

account for 65 and 35 percent, respectively. Because of the cold temperature, some warm water shrimps do not enter the northern Yellow Sea (e.g., Metapenaeus joyneri, Parapenaeopsis tenellus), while some cold water shrimps are not found in the northern East China Sea (e.g., Crangon affinis, Crangon orangon).

14. The species structure of the fish component of the ecosystem changed during the past 30 years. Overfishing of high quality bottom fish species has led to their replacement by lower value, smaller pelagic species. The project will develop a recovery strategy for depleted fish stocks based on an ecosystem-based perspective.

15. The cephalopods are composed of only 14 species. Warm water forms and warm temperate forms account for 65 and 35 percent, respectively; there are no cold water species. Of the warm temperature species, Sepia andreana and Euprymna morsei are endemic to the Yellow Sea and do not appear in the East China Sea. Of about 11 mammal species (e.g., minke whale, sperm whale, humpback whale, fin-less porpoise), most are cold temperate forms (e.g., harbor seal, northern fur seal, Steller's sea cow lion, fin whale, blue whale, right whale, and gray whale). Of these, fin whale and right whale migrate into the northern Yellow Sea to 39°N in winter and spring, and harbor seal migrate into the northern Bo Hai in winter and spring for reproduction.

16. The Yellow Sea, the East China Sea, and the East Sea/Sea of Japan were seasonally occupied by some of the large whales: fin whale (Balaenoptera physalus), humpback whale (Megaptera novaeangliae), and grey whale (Eschrichtius robustus). The grey whale may be part of a nearly extinct northwest Pacific population that summers in the Okhotsk Sea. If any of these species are seen in these waters now, they represent just a remnant of the pods that used to migrate and breed there. ROK has designated the grey whale as one of its national treasures. Other endangered marine mammals that live in the region are the black right whale (Eubalaena glacialis), whitefin dolphin (Lipotes vexillifer), Kurile harbor seal (Phoca kurilensis), and Japanese sea lion (Zalophus californianus japonicus). The striped dolphin (Stenella coeruleoalba, northwest Pacific stock) is believed exploited beyond sustainable yield.

17. The habitats of resource populations in the Yellow Sea can be divided into two groups—nearshore and migratory. Nearshore species include skates, greenline, black snapper, scaled sardine, and spotted sardine. These species are mainly found in bays, estuaries, and around islands, and they move to the deeper waters in winter. The migratory species (e.g., small yellow croaker, hairtail, and Pacific herring) have distinct seasonal movements and some (e.g., chub mackerel, Spanish mackerel, and filefish) migrate out of the Yellow Sea to the East China Sea in winter. The distribution of these two groups often overlap, especially in over-wintering and spawning periods.

18. When water temperatures begin to drop significantly in autumn, most resource populations migrate offshore toward deeper and warmer waters and concentrate mainly in the Yellow Sea depression. There are three over-wintering areas: The mid-Yellow Sea, 34 to 37°N, with depths of 60 to 80 m; the southern Yellow Sea, 32 to 34°N, with depths about 80 m; and the northern East China Sea. The cold temperate species (e.g., eel-pout, cod, flatfish, and Pacific herring) are distributed throughout these areas, and many warm temperate species and warm water species (e.g., skates, gurnard, Saurida elongata, jewfish, small yellow croaker, spotted sardine, fleshy prawn, southern rough shrimp, and cephalopods) are also found there from January to March. In the southern Yellow Sea, all species are warm temperate and warm water species (e.g., small yellow croaker, Nibea alibiflora, white croaker, jewfish, Septipinna taty, red seabream, butterfish, and chub mackerel). Their main over-wintering period is from January to April. The deep water areas of the central Yellow Sea and northern East China Sea are the over-wintering grounds for most species that migrate over long ranges.

19. Little information is available about the distribution of seabirds in the Yellow Sea area and off the east coast of China, but it is believed not many birds are in the area. Two known birds are the streaked shearwater (Calonectris lecomelas) and the Bulwer's petrel (Bulweria bulwerii), both of which breed off

the coast of eastern China. Of the endangered (or possibly extinct) seabirds of China, two live in the Yellow Sea region. 1) The relict gull (Larus relictus), which was collected for its breeding plumage. It used to breed near Sogo Nur, Gansu (1931 sightings), and Tanggu, Tianjin (1935 sighting and specimens). There have been no recent sightings. 2) The Chinese crested tern (Sterna bernstein), which was last sighted at Qingdao in 1937. It may be extinct but an unconfirmed sighting of 10 to 20 birds on Thailand in 1980 has raised hopes that it might still be extant. In the Republic of Korea, a total of 116 species of waterbirds and 17 species of falconiformes were recorded during 1994-1997. The total peak number was 550,000 for wintering waterbirds and 140,000 for migrating waders from 11 bird census sites on the west coast of Korea.

20. The dalmatian pelican (Pelecanus crispus) is bred inland at Lop jur, Xinjiang Uygur Zizhiqu, but no recent information is available. The saunders' gull (Laurua saunders) breeds in the north of China and Mongolia where its breeding grounds are unknown. However, it winters in the southern estuarine areas of Ningho, Zhejiang, and Shanghai. Of 370 bird species identified in ROK, 112 breed there and 17 localities have been designated breeding grounds.

21. The Yellow Sea LME is an important global resource. This international water-body 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 habitat loss resulting from extensive economic development in the coastal zone, and by the unsustainable exploitation of natural resources (primarily overfishing). Additionally, there is significant international shipping traffic through the waters of the Yellow Sea, with associated threats from spills and collisions with marine mammals.

22. 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 nearshore areas of the Yellow Sea each year. The major pollutants carried by sewage and wastewater are oils, mercury, cadmium, lead, COD, and inorganic nitrogen.

23. The eastern Yellow Sea has bad pollution in the shallow inlets of its southern coastline where the many islands prevent mixing with open ocean water and red tides persist. The chaetognatha (Sagitta crassa and S. enflata) and the copepods (Acartia clausi, Paracalanus parvus, and Centropages abdominalis) decreased significantly in 1981 compared with 1967 figures due to an increase of marine pollution levels in Jinhae Bay. The area affected included several famous swimming beaches, tourist hotels, and places of interest. Mass mortalities of the hard clam Meretrix lusoria populations in the Jeonbug Farming Area of Gyewhari and Naechodo, in the western region of ROK, were coincident with high densities of the pathogenic bacteria Vibrio anguillarum, the parasitic cercaria Bacciger harengulae, and a high concentration of pesticides.

24. 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 currents might inhibit the growth of HAB organisms.

25. Recently, however, the frequency and the area of the outbreaks have increased in the Yellow Sea coast, particularly, in the area where huge artificial constructions such as an underwater dam or dike were built. The constructions might restrict the circulation of water masses and reduce the turbulence intensity and turbidity. Under this circumstance red tide organisms grow fast and form red tide patches. The number and frequency of the trade ships between western cities in ROK and eastern cities in China have continuously increased. Therefore, the transport of red tide organisms in ballast waters might be partially responsible for the increase in the frequency and the area of red tides. Huge discharge from the

Changjiang River during the summer monsoon season sometimes reach the southern end of the Korean peninsula, thereby, and might carry the seed organisms or somehow inoculate existing spores.

SOCIAL AND ECONOMIC ISSUES

26. The Yellow Sea is a classic example of a semi-enclosed area, but remarkable for its massive population and increasing anthropogenic pressure. Shallow but rich in nutrients and living resources, it is favorable for coastal and offshore fisheries, and its waters are a highway for international shipping.

27. Approximately 600 million people live in the area that drains into the Yellow Sea. Large cities near the sea with 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.

28. Throughout the millennia of civilization in East Asia, periods of prosperity have been those in which the nations bordering the Yellow Sea have used the Sea cooperatively and efficiently. Such was certainly the case in the Tang dynasty of China, the Silla dynasty of Korea, and the Nara period of Japan. Conversely, when there was bad or inefficient use of this resource, all the coastal nations suffered. As the Yellow Sea coastal countries strive to develop and improve the welfare of their people, an optimal use of Yellow Sea resources could be the beginning of a new era of cooperation.

29. The commercial utilization of the living resources in the Yellow Sea dates back several centuries. With the introduction of bottom trawl vessels in the early twentieth century, many stocks began to be intensively exploited by Chinese, Korean, and Japanese fisherman and some economically important species such as the red seabream declined in abundance in the 1920s and 1930s (Xia 1960). The stocks remained fairly stable during World War II . However, due to a great increase in fishing effort throughout the entire Yellow Sea, nearly all the major stocks were being heavily fished by the mid-1960s. Since then, the composition of the fish catch has changed greatly , and the catch-per-unit-square kilometer has decreased to 2.3 MT in recent years.

30. 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.

31. Overfishing has also caused a decline in stock abundance for searobin, red seabream, 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.

32. 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, while 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.

33. 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 10^5 ha, and 5.4 x 10^5 ha in 1997. The yield of fresh flesh from bivalves was 2.0 x 10^5 t, 44 percent of the total mariculture yield in 1978; in 1997 it was 3 x 10^5 t. Scallops (Chlamys farreri) are luxurious seafood. 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.

34. 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) (MOMAF (Ministry of Maritime Affairs & Fisheries), 1998. Annual Report of Fisheries Trend. 286pp.). 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.

35. 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.

36. 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 Quingdao 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.

37. Oil exploration has been successful in the Chinese and DPRK portions of the Yellow Sea. In addition, the sea has become more important with the growth in trade among its bordering nations. The main Chinese ports are Shanghai, Lu-ta, Tientsin, Qingdao, and Ch'in-huang-tao; the main TOK port is Inch'on, the outport of Seoul; and that for DPRK is Namp'o, the outport for P'yongyang.

38. Tourism is an industry in its infancy in both China and Korea. Several sites of picturesque beauty around the coastlines of these countries could be promoted as tourist attractions. As access to China and Korea becomes easier for foreign visitors, the tourist industry will expand. The Karst coast near Dalian, the granite mountains of the western Liaoning coast in China, and the islands and swimming beaches of ROK, in particular Cheju Island, will be in even greater demand.

LEGISLATIVE ISSUES

39. The Yellow Sea is an international water-body and many of its problems can be solved only through international cooperation. The management of the Yellow Sea is especially complicated in that it is surrounded by nations that share some aspects of their historical and cultural background, but differ in internal political systems, external political and economic alignment, and levels of economic development.

40. For the future of the Yellow Sea, it is thus imperative for the coastal nations to realize the importance of regional cooperation. There are currently several agreements for bilateral regulation or development of the Yellow and East China Seas, but none of them are binding on all the coastal nations; nor is any nation a party to all the agreements. This means that there are insufficient consultations among the coastal nations. In addition, many of the existing national management policies or bilateral management programs for the Yellow Sea have been designed and carried out with insufficient attention to the transnational nature of the resources and industries that the Yellow Sea harbors and supports.

41. Of course, cooperation among the countries in the region is possible only when each nation in the region is convinced that it will be at least no worse off by cooperating than by going its own way. In the case of the Yellow Sea, it would appear that all nations bordering it would gain more from cooperation than they would without it.

42. The PRC, ROK, and DPRK already cooperate in many regional initiatives such as NOWPAP, TRADP, the Asia-Pacific Economic Cooperation Forum (APEC), Fisheries Marine Resources Conservation Working Groups, and the GEF/UNDP/IMO East Asia Seas project. These pre-existing institutional structures will play a crucial role in the development of a SAP, by providing the umbrella agreements between the countries under which specific cooperative activities may be planned and implemented.

INSTITUTIONAL ISSUES

43. The present project will build upon the institutional and programmatic framework put in place by the UNEP Regional Seas Programme's Northwest Pacific Action Plan (NOWPAP) and the environmental Memorandum of Understanding between the five member countries of the Tumen River Area Development Project (TRADP). The project supports and operationalizes, for the Yellow Sea, several elements of NOWPAP. The NOWPAP Action Plan states, "The implementation of the Action Plan will comprise a number of projects running in parallel." In essence, the present GEF Project can be considered as one of these parallel projects, as can the East Asia Seas GEF Project (EAS), which focuses on demonstration projects for Coastal Zone Management. The present GEF project can contribute to and benefit from several of the NOWPAP proposed regional activity centres, including Regional Marine and Coastal Information System; Monitoring and Assessment of Marine, Coastal and Associated Freshwater Environments; and the Biodiversity and Specially Protected Areas. The present project has little focus on Marine Pollution Preparedness and Response, so NOWPAP will have the lead here. The East Asia Seas GEF Project has two demonstration projects in the YSLME: one in the Bohai Sea of PRC, and one at Nampo in DPRK. The YSLME GEF Project will retain close contacts with each of these existing programmes, perhaps sharing some common Steering Committee members. In addition, the present project will liaise closely with other regional efforts, including the proposed GEF Project on Wetland Biodiversity Conservation and Sustainable Use in China (one site of which, Yancheng Coast, is on the Yellow Sea), the existing GEF Project on the Tumen River (Preparation of Strategic Action Programme (SAP) and Transboundary Diagnostic Analysis (TDA) for the Tumen River Area, its coastal regions and related Northeast Asian Environs), and the GEF Ballast Water Project (which has a Pilot Demonstration Project In Dalian, PRC, within the YSLME). Other related projects include the NEAR-GOOS (North-east Asian Region Global Ocean Observing System), and other IOC/WESTPAC activities. Finally, the

project will have close cooperation with the proposed Medium-sized project *Biodiversity Management in the Coastal Area of DPRK's West Sea,* which has been submitted for approval.

44. Though the DPRK presently has declined full participation in the YSLME GEF project, efforts will continue to incorporate their participation when the DPRK elects to join in the activities. Meanwhile, the DPRK MSP provides a complementary activity that will benefit the YSLME.

45. The focus of the YSLME project on sustainable fisheries management and reducing stress to the ecosystem provides an opportunity for exploring how this GEF project can further national and regional commitments to certain international conventions and agreements, such as the United Nations Convention on the Law of the Sea (UNCLOS), the FAO Code of Conduct for Responsible Fisheries, and the Global Programme of Action for the Protection of the Marine Environment from Land – based Activities (GPA).

RATIONALE AND OBJECTIVES

LONG-TERM OBJECTIVES

46. The long-term development/environment objective (Level 1) of the project is: **ECOSYSTEM-BASED, ENVIRONMENTALLY-SUSTAINABLE MANAGEMENT AND USE OF THE YSLME 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**

47. In order to achieve this objective, the purpose of this project (Level 2) will be to prepare a Transboundary Diagnostic Analysis (TDA), National Yellow Sea Action Plans (NYSAPs), and a regional Strategic Action Programme (SAP). This project will also initiate and facilitate the implementation of the SAP. The SAP will consist of a series of legal, policy and institutional reforms and investments to address the priority transboundary issues identified in the TDA/SAP/NYSAP formulation process.

48. The preparation of the TDA will be based on the preliminary TDA undertaken during the preparatory phase of this project. The TDA will be used as a basis for focusing on the threats, their root causes and the sectoral activities that endanger the critical ecosystem of the YSLME to implement selected components of the SAP, as appropriate. The SAP will identify priority actions to be taken by the participating countries to restore and preserve the YSLME. The SAP will adopt a comprehensive approach and will address land and sea-based sources of marine pollution, degradation of critical habitats and over-fishing.

49. The SAP will be developed in cooperation with the National Yellow Sea Action Plans which will be the National Plans focusing on Yellow Sea issues, both national and transboundary. The SAP and NYSAPs will be developed concurrently, with the SAP flowing naturally from the NYSAPs.

50. The SAP will fully assess the impact of economic growth in the region, map out alternative development scenarios which protect global environmental resources, and will enable the riparian states to reach a consensus on priorities, targets, programmes and projects to protect the shared resources of the YSLME. The SAP will include an estimation of the required financial resources and a strategy to mobilize these resources. GEF project proposals to implement selected transboundary elements of the SAP will be prepared using the incremental cost approach. The SAP is expected to play a key role in ensuring that global environmental benefits are provided in tandem with facilitating sustainable and environmentally sound economic development in the area over the coming decades.

51. The preparation of the SAP will be carefully designed to ensure that the SAP is action-oriented, locally owned, government supported, sustainable, and responsive to the local conditions. This, and the

close attention to be paid to mobilizing resources to the SAP, will ensure that it is implemented and not stored on shelves. As a first step for the formulation of the TDA and SAP, the project will strengthen existing mechanisms for regional cooperation in regional, national and local bodies and develop their capacity for project identification, formulation and management. It will also immediately compile, from existing sources, a comprehensive database on international waters and biodiversity in the region and support an in-depth study on environmental research systems and information systems in the area.

52. The project will rely on a strong participatory approach to formulate the SAP and NYSAPs. A series of consultation meetings will be held at the local and grassroots levels to identify environmental priorities, generate and validate information and ensure widespread support to the approaches proposed in the SAP and NYSAPs. An awareness-raising programme on transboundary environmental issues will be carried out parallel to the TDA preparation and this will foster local support for the preparation and implementation of the SAP and NYSAPs.

53. In addition to providing global environment benefits and shaping the development of the region into the next century, the capacity built under the project will be of general use to development and environmental management in the region. In particular, the capacity to cooperate effectively on a regional level will be useful for all future environmental initiatives involving two or more of the concerned countries. Moreover, the databases developed under the project will be of use to many local, national and regional initiatives in both the environmental and economic spheres.

54. Following completion of the TDA, NYSAPs, and SAP, this Project will initiate and facilitate the Implementation of the SAP. Previous experience in GEF IW Projects has shown that a Project focusing solely on TDA, NAP, and SAP will likely leave a significant time lag between formulation of the SAP and its implementation, thereby reducing regional ownership and government commitment. To avoid this problem the present project also proposes to initiate and facilitate the SAP implementation process in the Region.

RATIONALE FOR GEF FINANCING

55. The present project is consistent with the GEF Operational Strategy of April 1996, specifically with the GEF's strategic emphasis on International Waters and Biodiversity, as well as the April 1997 GEF Operational Programme 8 for water-body based large marine ecosystems. The project will incorporate the priorities delineated in the relevant environmental agreements to which any or all of the participating countries are involved.

56. The proposed project will help the riparian countries of the YSLME to overcome institutional and other barriers to collaboration and help them to identify and resolve the priority transboundary environmental concerns identified in the TDA and SAP processes. The proposed project coordinates among implementing agencies, regional development banks, countries, and other stakeholders, and generates programmatic benefits for the global environment that would not otherwise be achievable.

57. GEF funds will support the identification and ultimate mitigation of transboundary issues that would be neglected if addressed only from a national perspective. The TDA and SAP will involve international donors, national and local governmental institutions, industries, and other key stakeholders that have important actions to take in restoring and protecting the YSLME environment.

58. The GEF International Waters Operational Programme referred to above emphasizes "institutional building ... and specific capacity-strengthening measures so that policy, legal and institutional reforms can be enacted in sectors contributing to transboundary environmental degradation." This project supports institutional capacity building for long-term regional cooperation as well as helping to strengthen regional capacities in environmental management, monitoring of priority pollutants, public awareness and preservation of transboundary living resources.

59. The development of the TDA and SAP for YSLME will further GEF goals for waterbody-based international waters operational programmes by:

- Providing a conceptual and planning framework within which enabling activities consistent with national and regional priorities may be implemented;

- Designing a sustainable institutional structure that is regional or supranational in scope, thereby ensuring global, local, and national environmental benefits;

- Promoting a rigorous scientific monitoring and assessment programme in the YSLME in order to reduce the uncertainty involved in management and policy making;

- Utilizing collaborative TDA, SAP and NYSAP formulation; and

- Stakeholders analysis and involvement.

60. The project formulation includes improvements made in response to GEF comments made at the PDF stage:

- Acknowledgement of the role or Interministerial Committees, particularly for SAP implementation;

- Funding has been allocated for stakeholder identification;

- Funding has been set aside for the DPRK to foster their involvement at an appropriate pace; and

- The project will liaise closely with the GEF East Asian Seas project which has two pilot sites in the YSLME, as a vehicle to replicate the successful Xiamen ICM experience. The present project takes a complementary LME management approach to address specific YSLME transboundary issues of fisheries and pollution. Together, the EAS and YSLME approaches will present a powerful model for replication in the region.

61. The project was formulated with international conventions and practices in mind, including the United Nations Convention on the Law of the Sea (UNCLOS), the FAO Code of Conduct for Responsible Fisheries (CCRF), and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA). Details of mechanisms of interaction and relationships with the GPA, CCRF, and UNCLOS will be provided in the Project Document.

ACTIVITIES

62. The following tables list the major immediate objectives of the project, as well as the major ouptuts. The specific activities relating to the objectives and outputs are listed in Annex D.

63. The specific project Activities were derived from a series of meetings and consultations with the Region. During a Regional Stakeholders' Workshop, held in October, 1999, in the ROK, the Preliminary Transboundary Diagnostic Analysis was discussed and improved. During this process, the Major Perceived Problems of the Yellow Sea were identified. Though there were discussions on some items, the list of Problems was derived on the consensus principle. Once the Major Perceived Problems were identified, the Root Causes were agreed upon. Associated with each Root Cause was a list of specific features of the root cause that clarified the different aspects that contribute to the Perceived Problem. Finally, based on this list of Perceived Problems and Root Causes, the Priority Areas for Future

Intervention were developed, grouped into 5 major categories. Following this process, the Steering Committee then ranked each of the Intervention areas in terms of their priority within the region, and in terms of their transboundary importance.

64. Once the above process was completed, a second regional meeting identified specific Activities that could be implemented as part of the GEF Intervention, to assist the Region in addressing the Perceived Problems and Root Causes. These Activities are presented below as optional Annex D, and form the basis for the GEF Intervention. The project budget is based on the Activities of optional Annex D, which provides in much greater detail the specific actions that will be taken to approach the major perceived problems and root causes.

65. Four major Immediate Objectives were developed for the Project based on the areas of intervention identified. These major objectives have associated outputs, components, and activities. Immediate Objectives and Components are:

I. Develop Regional Strategies for Sustainable Management of Fisheries and Mariculture	**II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection**	**III. Propose and Implement Actions to Reduce Stress to the Ecosystem**	**IV. Develop and Pilot Regional Institution and Capacity Building Initiatives**
I.A Stock assessment	II.A Habitat conservation	III.A Stressors to ecosystem	IV.A Stakeholders involvement
I.B Carrying capacity in fisheries and mariculture	II. B Vulnerable species	III.B Carrying capacity of ecosystem	IV.B Regional coordination
I.C Mariculture production	II.C Genetic diversity	III.C Contaminant inputs	IV.C National institutions
I.D Disease in mariculture	II.D Introduced species	III.D Contaminant levels	IV.D Financial instruments
I.E Regional Fisheries agreements and National laws	II.E Biodiversity regulations	III.E HABs and Emerging disease	IV.E Data and information management
I.F Fisheries Management plan	II.F Regional Biodiversity assessment and regional Biodiversity Action Plan	III.F Hot spots analysis	IV.F Public awareness and participation
		III.G Emergency planning and preparedness	
		III.H Legal and regulatory	
		III.I Fate and transport analysis to facilitate SAP analysis	

66. The first Immediate Objective, **Develop Regional Strategies for Sustainable Management of Fisheries and Mariculture,** addresses the need for sustainable fisheries management and fisheries recovery plans agreed on a regional basis. The second Immediate Objective, **Propose and Implement Effective Regional Initiatives for Biodiversity Protection**, addresses the need for coordinated regional action to preserve globally significant biodiversity. The third Immediate Objective, **Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health**, addresses the YSLME as a marine ecosystem, and develops management practices based on an understanding of ecosystem behavior, the very basis for the Large Marine Ecosystem Concept. The fourth Immediate Objective, **Develop and Pilot Regional Institutional and Capacity Building Initiatives**, focuses the intervention on the required national and regional institutional and capacity building and strengthening, on the preparation of investment portfolios, and on coordination of preparation of the TDA, NYSAPs, and YSLME SAP.

67. One important component under Immediate Objective IV is Financial Instruments (Component IV.D in Annex D.) This Component Activity is particularly critical to developing a sustainable framework for the YSLME. It includes elements of a Priority Investment Portfolio (training in environmental project identification and preparation, pre-feasibility studies for PIP creation, and assessing other mechanisms for financial sustainability.) This Component also includes a matched small grants program for PIP purposes, as well as for early SAP implementation.

68. Amongst the lessons learned from previous international waters projects is that the TDA/NAP/SAP phase is often followed by a period of inactivity as the interventions required to assist in SAP-implementation are slow to materialize. In order to provide a seamless segue from the TDA/NAP/SAP process into the SAP implementation phase, the present YSLME project is developed to include initial facilitation for the SAP implementation process. This proposal provides a bridging period during which the SAP implementation would be initiated, allowing transition to full national implementation responsibilities for the SAP. This bridging period permits time for the GEF incremental interventions to be formalized and funded. Thus, this YSLME project presents a novel solution to lessons learned from some previous IW projects, thereby reducing risk to the success of the GEF intervention.

69. The Activities for each component and sub-component are divided into these three phases, based on the approach outlined above:

I. Assessing stress to the ecosystem/TDA: This phase leads directly to the TDA, and is comprised of capacity building, assessments, and reviews of existing knowledge, combined with judicious and limited filling-in of the major gaps in knowledge.

II. Reducing stress to the ecosystem/NYSAP & SAP: This phase leads to definition of actions that will be undertaken as part of the NYSAPs and SAP formulation. This phase will include development of management plans, agreements, strategies, and demonstration projects.

III. SAP Implementation and facilitation: This two-year final phase of the project is focused on facilitation of the implementation of the SAP, including demonstration projects and coordination. The segue from SAP approval to SAP implementation is a critical juncture: one that if not facilitated may lag in time, reducing effectiveness, government commitment, and urgency to address the environmental issues. The decision to include a post-SAP implementation phase to this GEF project was made based on lessons learned from other IW GEF Projects which suffered such a lag (e.g., Black Sea Environment Programme). The SAP implementation phase, therefore, is a bridging period to assist the countries and the region to implement the activities of the SAP. In other words, the SAP implementation phase will assist legal, policy and institutional reforms and investments to address sectoral causes of transboundary issues. The Interministerial Coordination Functions will be responsible for SAP implementation in each country.

TABLE <1> PROJECT COMPONENTS AND ACTIVITIES

Immediate Objective / Major Outputs	**ACTIVITIES**		
	I. Assessing Stress to the Ecosystem/ TDA	**II. Reducing Stress to the Ecosystem/ SAP Preparation and Associated Capacity Building**	**III. SAP Implementation**
Objective I: Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture			
Expected Outputs:	Knowledge of fishery stocks/legislation and regulations summarized	Common methodologies and management plans developed	Demonstration projects piloted.
Objective II: Propose and Implement Effective Regional Initiatives for Biodiversity Protection			
Expected Outputs:	Biodiversity status summarized.	Regional Biodiversity Strategy drafted.	Implementation of Regional Biodiversity Strategy started.
Objective III: Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health			
Expected Outputs:	Date collected and regional assessments performed.	Regional Strategy drafted (which contains priorities and monitoring system).	Implementation of Strategy started.
Objective IV: Develop And Pilot Regional Institutional And Capacity Building Initiatives			
Expected Outputs:	Create network for institutions and individuals.	Develop strategy for participation, coordination, and awareness.	Implement a sustainable, regional program for cooperation, coordination, and management.

RISKS AND SUSTAINABILITY

70. The possible political risks are greatly minimized as the present political climate and economic achievements in the region are in favor of environmental protection and sustainable use of marine and coastal resources. The project, in fact, responds to the common environmental concerns of the countries in the region. Compared with other IW projects addressing similar sized water bodies, the risks may be smaller in the YSLME, due to the small number of countries participating. Only three countries border the YSLME, so legal, policy, and institutional reforms may be easier to implement than in many other IW projects, where anywhere from five to 16 countries participate. Regional reforms with large numbers of countries inherently present larger risks.

71. During the last several years the countries have demonstrated a willingness to co-operate in matters relating to the environment of the Yellow Sea both through bilateral programmes; through active participation in regional programmes including NOWPAP, Tumen River Area Development Programme(TRADP: including the GEF-funded SAP/TDA for the Tumer River Area), the GEF Ballast Water Project (with a pilot site in Dalian), and the GEF/UNDP/IMO East Asian Seas Project (having two demonstration sites in the YSLME: one at Nampo, DPRK, and the second in the Bohai Sea). There is increasing recognition that the benefits resulting from co-operative actions in managing the environment of the Yellow Sea are not dependent on a resolution of the unresolved issues, hence the risks of potential disruption to the project seem likely to be minimized.

72. A substantial proportion of the assured co-financing by governments is derived from the existing staff and recurrent budgets of the involved ministries and government departments. It is anticipated that project activities will strengthen the influence of these ministries at a national level and hence encourage substantial increases in the recurrent budgets of the departments concerned in the future. The countries already contribute financially to regionally coordinated actions and such contributions are anticipated to increase as a consequence of this project.

73. Regarding the sustainability of activities and components beyond the life of the project, a number of the proposed activities during the first three years of the project are preparatory in nature with a defined life span. The need for such actions reflects the inadequacy of the present data and information available to assess priorities in a totally objective manner. In elaborating the data and information in parallel with refining the SAP, mechanisms will be put in place that require minimal recurrent inputs at the national level to ensure their continued operation beyond the life of the project. It is anticipated that the regional framework for co-operation will be strengthened through undertaking this project, such that the recurrent costs of subsequent regional co-ordination will be met from within the region. The SAP facilitation bridging period (essentially years 4 and 5) is intended to smooth the transition from the SAP formulation to the SAP implementation phase.

GOVERNMENT COMMITMENT

74. Each of the two participating countries has developed a legal and institutional framework for nature conservation and control of environmental degradation and pollution (see Preliminary TDA, Annex E). Both countries are signatories of international conventions to protect biodiversity, international waters and wetlands, among others. These international commitments are reflected in national policies and legal arrangements. Through active participation in the formulation process for this project, the participating governments have demonstrated their strong commitment to taking part in the SAP preparation process and to implementing joint strategies and activities to protect common ecosystems and resources. The existing Interministerial Coordination Function will be responsible for coordinating SAP and NYSAP implementation in each country.

FINANCIAL SUSTAINABILITY

75. Potential donors will be involved in all stages of the SAP formulation process to ensure that the SAP is responsive to donor requirements. In addition, the SAP will include a detailed financing strategy. The strategy will determine traditional and innovative mechanisms (inter-governmental, governmental, non-governmental, private and financial institutions) for financing the priority activities identified in the SAP. Sub-component IV.D (Financial Instruments) will focus on identifying these mechanisms from the outset of the project. In particular, the role of the private sector towards long-term sustainability will be explored.

STAKEHOLDER PARTICIPATION AND IMPLEMENTATION ARRANGEMENTS

76. The approach to information gathering and planning to be utilized in the project assures the participation of all stakeholders concerned. Activities planned early in the GEF project are directed towards stakeholder participation. At all points, wide consultation and extensive participatory workshops will be encouraged. The project is designed to ensure the active participation of the following stakeholder groups (see Optional Annex F):

- Respective Governments of the two participating countries, at national and local levels;
- Local communities and populations in the respective areas;
- Scientific Community
- Representatives of civil society, represented by NGOs and other groups of interest (professional associations, syndicates, etc.); and
- Representatives of the donor community, represented by the implementing agencies and other international cooperation organizations.
- Private Sector

77. Driven by the governments of the PRC and ROK, this project is a regional and national priority in the PRC and ROK, and is consistent with their national environmental policies. The countries have fully demonstrated their willingness to cooperate in the area of regional environmental protection and management by endorsing NOWPAP, initiating various national marine environmental programmes, and participating in regional GEF environmental projects such as the TDA and SAP for the Tumen River Area and the GEF/UNDP/IMO East Asian Seas Project.

78. DPRK has demonstrated their willingness to cooperate in regional environment initiatives through their active involvement in the TDA and SAP for the Tumen River Area project, East Asian Seas Project, and NOWPAP. Protection of the Yellow Sea is also a priority to DPRK and the government has indicated DPRK may participate in the project at a later date. Full provisions are made for their possible participation. There is a regional recognition that UNDP should work diligently to include the Democratic People's Republic of Korea (DPRK) into the Project. The past efforts on UNDP's behalf are recognized, but the region urges continued progress in this matter.

79. Representatives of numerous institutions from PRC and ROK have actively participated and greatly contributed to the success of the PDF-B phase of the project. All of them strongly endorsed the present project proposal and will cooperate and contribute to the implementation of the full phase of the project. Among the many participating institutions are:

People's Republic of China:

- UNDP/PRC
- State Oceanic Administration, Beijing
- First Institute of Oceanography (SOA), Qingdao

- Yellow Sea Fisheries Institute, Ministry of Agriculture, Bureau of Fisheries, Qingdao
- Chinese Academy of Science
- Ministry of Agriculture, Bureau of Fisheries
- State Environmental Protection Administration

Republic of Korea:
- UNDP/ROK
- Korea Ocean Research and Development Institute (KORDI)
- Korea Maritime Institute (KMI)
- Ministry of Maritime Affairs and Fisheries (MOMAF)
- Ministry of Foreign Affairs and Trade (MOFAT)
- Ministry of Environment
- National Fisheries Research and Development Institute

80. This wide participation of stakeholders will ensure that they not only understand and support the SAP, but will ensure their commitment to its implementation. The Public Involvement Plan Summary in Annex E provides further details of stakeholder participation under project implementation.

PROGRAMME IMPLEMENTATION AND INSTITUTIONAL FRAMEWORK

Regional Institutions

81. The YSLME Steering Committee was composed during the PDF-B phase of representatives of the YSLME member countries and International Partners. Selected observers may be added at the discretion of the Steering Committee.

82. The Steering Committee for the Programme will be responsible for approving strategic decisions and annual workplans, setting program direction, reviewing progress, and identifying new and additional funding. Representatives of private sector and other organizations that contribute to the YSLME would be encouraged to participate in the Steering Committee. The Steering Committee will provide policy-level liaison to national governments, through Intersectoral Coordination in each country, regarding implementation of the program on the country level, and will provide direction to the Programme Coordination Unit (PCU) regarding preparation of the Yellow Sea Strategic Action Programme (SAP).

83. The Strategic Management Advisory Committee (SMC) would provide national inputs into high level management and administration issues, at an operational level. Rather than rely on the Steering Committee for national input, a working regional management advisory committee will provide that continued national input, and may serve as a mechanism for long-term sustainability of the project. Intersectoral coordination can be encouraged actively be the SMC.

84. The Project Coordination Unit, once formed, would provide a coordination and management structure for the development and implementation of the Yellow Sea Project in accordance with the rules and procedures of GEF/UNDP consistent with directions provided by the Steering Committee. Specific attention will be given to the development of a regional intersectoral coordination initiative so as to fully involve different government ministries and the private sector, as well as other Stakeholders, in the Project. This regional intersectoral coordination function will liaise closely with those national institutions and agencies which have been designated responsibility for such intersectoral coordination (see National Institutions below). The location of the PCU is under discussion. Both PRC and ROK have

offered to house the PCU. Negotiations are underway to decide the location of the PCU, and the Chairmanships of the Working Groups (see below).

85. Regional Thematic Working Groups will be responsible for: development of a work plan and implementation of activities in respective thematic areas; regional coordination within area of competency; development of relevant regional recommendations; providing guidance and strategy within area of competency; providing assistance in development of the TDA; and providing assistance in development and implementation of the National Yellow Sea Action Plans (NYSAPs) and Strategic Action Programme (SAP). The Working Groups (WG) will be formed from the representatives from the participating countries nominated by their governments. The chair person of each WG will be nominated by respective governments.

National Institutions

86. National Government Focal Point Agencies:
For the PRC, the State Oceanic Administration (SOA) is the National Government Focal Point. For the ROK, the Korea Ocean Research and Development Institute (KORDI) is the Focal Point Agency.

87. The National Government Focal Point Agencies (NGFPA) have established their Interministerial Coordination Committee and provide guidance and ensure coordination of a wide range of National institutions and organizations directly responsible for the development and implementation of the Programme at the National level.

88. During the PDF-B the Interministerial Coordination Committees were established in both PRC and ROK. In PRC the Interministerial Coordination Committee consists of three policy organizations and four implementation agencies:

Ministry of Foreign Affairs (MFA)
Ministry of Finance (MOF)
Ministry of Science and Technology (MOST)
State Oceanic Administration (SOA)
State Environmental Protection Agency (SEPA)
Ministry of Communications (MOC)
Ministry of Agriculture, Bureau of Fisheries (MOA/BF)

89. The Committee is led by a Deputy Administrator of SOA, which is the National Focal Point for the YSLME Project. The Committee supports the YSLME, and will meet periodically according to the demands of the Project.

90. The ROK established its Interministerial Coordinating Committee in 1999 also. The Committee consists of eight members:

Ministry of Foreign Affairs and Trade (MOFAT)
Ministry of Marine Affairs and Fisheries (MOMAF)
Ministry of Environment (MOE)
Ministry of Science and Technology (MOST)
National Fisheries Research and Development Institute (NFRDI)
Korea Maritime Institute (KMI)
Korea Ocean Research and Development Institute (KORDI)
UNDP/Seoul

91. The National Focal Point for the YSLME Project is MOFAT.

Project Implementation

92. The UN Office for Project Services (UNOPS) served as Executing Agency during the PDF-B phase and will continue to serve as Executing Agency for the Project. UNOPS will coordinate overall execution of the respective project components.

93. Discussions have been initiated with the Asian Development Bank to solicit their assistance in the Priority Investment Portfolio component of this project. The ADB has indicated their willingness to discuss ADB execution of that portion of the project, probably through an Interagency Agreement with UNOPS. The ADB would execute all aspects of Component IV.D, except the matched small grants programme.

INCREMENTAL COSTS AND PROJECT FINANCING

94. The main focus of the project is to enable the region to undertake **integrated ecosystem management** approaches to addressing regional/transboundary environmental problems. This will be accomplished through specialized skills training, regional networking and demonstration projects, as well as forging inter-governmental and inter-sectoral partnerships to achieve cost-effective environmental management at the local and sub-regional levels. The project does not replace or substitute baseline activities, recognizing that existing national marine environmental activities are largely sectoral in approach, while existing regional environmental programs remain at the planning or information gathering stage.

95. The project financing, broken out by objective and component, is laid out in Table 1. The baseline activities are funded at a level of approximately $162 million. The alternative is identified as $184 million. The increment of about $22 million will be co-financed by the governments ($8.9 million) and GEF ($13.3 million plus project support costs.) The increment is directed towards achievement of global benefits.

96. In addition to this baseline and government co-financing, ongoing activities by UNDP in the region will contribute to the YSLME programme. In particular, UNDP funding for a "Marine Environmental Survey of the Yalu River" ($650,000), plus UNDP co-financing of the EAS project including an ICM demonstration site in DPRK, brings a total co-financing from UNDP of approximately $1.388 million. Objectives 1,3,6,7, and 10 of the EAS project will contribute directly to the goals of the YSLME project.

<Table 1> Objective / Component Financing

Objective	Component	Baseline (B)	Alternative (A)	Increment (A-B)	
				Governments	**GEF**
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	A. Stock Assessment	16,130,873	18,839,445	1,062,500	1,646,072
	B. Carrying Capacity in Fisheries and Mariculture	963,855	1,270,497	80,000	226,642
	C. Mariculture Production	58,579,267	59,715,762	963,855	172,640
	D. Disease in Mariculture	446,747	567,497	N/A	120,750
	E. Regional Fisheries Agreements and National Laws	45,833	121,583	N/A	75,750
	F. Fisheries Management Plan	N/A	75,000	N/A	75,000
	Total ROK	**59,764,166**		**1,142,500**	
	Total PRC	**16,402,409**		**2,722,891**	
	Total Objective	**76,166,575**	**82,348,820**	**3,865,391**	**2,316,854**
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	A. Habitat Conservation	14,754,821	15,056,233	N/A	301,412
	B. Vulnerable Species	N/A	155,600	N/A	155,600
	C. Genetic Diversity	2,561,666	2,910,666	N/A	349,000
	D. Introduced Species	N/A	217,368	N/A	217,368
	E. Biodiversity Regulations	N/A	121,410	N/A	121,140
	F. Regional Biodiversity Assessment & Regional Biodiversity Action Plan	602,410	708,170	N/A	105,760
	Total ROK	**16,111,668**		**0**	
	Total PRC	**1,807,229**		**1,759,036**	
	Total Objective	**17,918,897**	**20,928,213**	**1,759,036**	**1,250,280**
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality, and Protect Human Health	A. Stressors to Ecosystem	21,751,544	21,913,684	N/A	162,140
	B. Carrying Capacity of Ecosystem	N/A	908,760	480,000	428,760
	C. Contaminant Inputs	36,667	198,079	N/A	161,412
	D. Contaminant Levels	11,879,478	12,299,798	320,000	100,320
	E. Harmful Algal Blooms and Emerging Disease	11,224,759	11,383,399	N/A	158,640
	F. Hot Spots Analysis	7,794,608	8,093,888	N/A	299,280
	G. Emergency Planning and Preparedness	155,000	306,320	N/A	151,320
	H. Legal and Regulatory	33,333	113,093	N/A	79,760
	I Fate and Transport Analysis to Facilitate SAP Analysis	1,440,612	1,793,452	N/A	352,840
	Total ROK	**13,809,977**		**800,000**	
	Total PRC	**40,506,024**		**1,759,036**	
	Total Both Objective	**54,316,001**	**58,769,509**	**2,559,036**	**1,894,472**

<Table 1> Objective / Component Financing (Continued)

Objective	Component	Baseline (B)	Alternative (A)	Increment (A-B)	
				Governments	GEF
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	A. Stakeholders Involvement	N/A	316,500	N/A	316,500
	B. Regional Coordination	187,500	3,374,791	N/A	3,187,291
	C. National Institutions	963,855	2,094,477	650,602	480,020
	D. Financial Instruments	N/A	3,007,840	N/A	3,007,840
	E. Data and Information Management	734,362	1,197,892	80,000	383,530
	F. Public Awareness and Participation	11,776,667	12,267,827	N/A	491,160
	Total ROK	**12,180,457**		**80,000**	
	Total PRC	**1,481,927**		**650,602**	
	Total Both Objective	**13,662,384**	**22,259,327**	**730,602**	**7,866,341**
	Total	**162,063,857**	**184,305,869**	**8,914,065**	**13,327,947**

PDF-B: 349,650 US$

Project Support Costs: 1,066, 236 US$

Total Project Costs: 14,743,833 US$

MONITORING, EVALUATION AND DISSEMINATION

95. Project objectives, sub-components and emerging issues will be regularly reviewed and evaluated at annual meetings of the Project Steering Committee. The project will be subject to the various evaluation and review mechanisms of UNDP, including PPER (Project Performance and Evaluation Review), TPR (Tri-partite Review), mid-term Independent Evaluation and an external Evaluation and Final Report prior to the termination of the project. The project will also participate in annual PIR (Project Implementation Review) exercise of the GEF.

96. In addition, standard GEF indicators for monitoring and evaluation purposes will be developed during the project for application in subsequent stages of the Yellow Sea LME and monitoring SAP implementation. They will consist of process indicators, stress reduction indicators, and environmental status indicators.

97. This project will be involved from the start in the new GEF International Waters Learning Exchange and Resource Network (IW: LEARN) program. IW: LEARN is a distance education program whose purpose is to improve global management of transboundary water systems. IW: LEARN will provide structured interactive conferencing capacity across the portfolio of GEF International Waters projects which will allow participants to share learning related to oceans, river basins, and coastal zone management. For environmental professionals working on GEF-financed projects, IW: LEARN will greatly expand opportunities for peer-to-peer consultation, collaborative research with physically distant colleagues, opportunities to exchange best practices and training modules among projects, and the delivery of short courses.

98. The project design includes the communication of all project findings to concerned and interested parties. Many activities in the project target the two-way communication of information. These include consultation meetings, awareness campaigns, conferences with regional and donor governments, and Internet connections. These activities, in addition to standard GEF, UNDP, and executing agency procedures will assure an effective and wide dissemination of project findings.

LIST OF ANNEXES

Required Annexes:

Annex A **Incremental Cost Annex**

Annex B **Logframe Matrix**

Annex C **STAP Roster Technical Review**

Annex C1 **Response to STAP/IA comments**

Optional Annexes:Annex D **Detailed List of Activities**

Complete listing of specific activities within each Component and Sub-component, based on regional prioritization of environmental issues.

Annex E **Preliminary transboundary diagnostic analysis**

Preliminary analysis of the transboundary environment issues facing the Yellow Sea Large Marine Ecosystem, based largely on the National Reports from the countries. Lacking are complete and complementary data which will be produced during the TDA process.

Annex F **Public Involvement Plan Summary**

Summary of how various Stakeholders will be involved in the YSLME, including governance, management, and implementation, along with reference to the major Objectives/Components where their participation is identified.

Annex G **Baseline Activities and co-financing**

Based on input from the PRC and ROK, as well as UNDP, the baseline and co-financing were identified to assist in the Incremental Cost Analysis.

Annex H **List of Publications Prepared During the PDF-B**

Published materials available from UNDP describing the process and steps taken to develop the Preliminary TDA, the Project Brief, and the Project Document.

Annex I **Institutional Arrangements**

Schematic of the Implementation structure for the YSLME, including governance, management, regional activities, and national activities

Annex J **Copies of GEF Operational Focal Point Endorsement letters**

ANNEX A INCREMENTAL COST ANALYSIS

Broad Development Goal

A1. Three countries share the natural heritage of the Yellow Sea, the Democratic People's Republic of Korea, People's Republic of China, and Republic of Korea. Despite their political and social diversity, the people of the region share a common concern for the Yellow Sea. Today the Yellow Sea faces serious environmental problems, many of a transboundary nature, that arise from anthropogenic causes. The countries of the region are confronting difficult economic and administrative adjustments that complicate environmental management and natural resource protection efforts. The three littoral countries share common problems with pollution abatement and control from municipal and industrial sites in the Yellow Sea basin, as well as contributing non-point source contaminants from agricultural sources. All of the them are urgently seeking to address problems of reduced fish catches, caused in part by overfishing, harmful algal blooms, and degradation of coastal habitats, caused by intensive coastal development and effects of climate variability on the Yellow Sea Large Marine Ecosystem. The major perceived problems of the Yellow Sea LME can be summarized as follow:

- Decline of commercial fisheries;
- Degradation of biodiversity, loss of coastal habitats, loss or imminent loss of endangered species and their genomes;
- Water quality deterioration;
- Unsustainable mariculture;
- Poor or unsatisfactory human health quality, unsanitary conditions in many beaches and bathing waters, contaminated fish and sea products;
- Harmful algal blooms (emerging disease); and
- Inadequate capacity to assess ecosystem.

A2. The broad development environmental goal of this project is to ensure 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.

Baseline

A3. 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 habitat loss resulting from extensive economic development in the coastal zone, as well as by the unsustainable exploitation of natural

resources. Additionally, there is significant international shipping traffic through the waters of the Yellow Sea. Constraints in legislation and setting of environmental standards, inadequate scientific data exchange and lack of public awareness and participation in planning process hinder efforts at both the national and regional levels. Each participating country is implementing its own environmental protection programmes. However, the single-country approach is not sufficient to achieve global environmental benefits in the region.

A4. The Yellow Sea riparian countries have to decide how to adjust national initiatives to be compatible with emerging international legal and technical obligations, or, conversely, the extent to which each state wishes to ignore or deviate from international practice.

A5. There is also a lack of a formal infrastructure to bring about international collaboration and cooperation in monitoring and research activities that would delineate the spatial distribution of a contaminant and its subsequent effects in the Yellow Sea and whether it would cross geopolitical boundaries. The lack of a formal structure prevents the development of well-coordinated, cooperative baseline studies and coordination in emergencies (such as a spill of oil or of other toxic and hazardous materials). Monitoring and research programs are not as effective as they should be because they stop at some governmental border, rather than at ecosystem or natural boundaries. Effective studies of transboundary contamination require excellent coordination, cooperation, and synchronization of sampling to enable effective analysis, integration, and interpretation of data across a region.

A6. During the last several years the countries have demonstrated a willingness to co-operate in matters relating to the environment of the Yellow Sea both through bilateral programmes; through active participation in regional programmes including NOWPAP, Tumen River Area Development Programme (TRADP: including the GEF SAP/TDA for the Tumer River Area), the GEF Ballast Water Project (with a pilot site in Dalian), and GEF/UNDP/IMO East Asian Seas Project (having two demonstration sites in the YSLME: one at Nampo, DPRK, and the second in the Bohai Sea).

A7. A substantial proportion of the assured co-financing by governments is derived from the existing staff and recurrent budgets of the involved ministries and government departments. It is anticipated that project activities will strengthen the influence of these ministries at a national level and hence encourage substantial increases in the recurrent budgets of the departments concerned in the future. The countries already contribute financially to regionally coordinated actions and such contributions are anticipated to increase as a consequence of this project.

A8. Each of the two participating countries has developed a legal and institutional framework for nature conservation and control of environmental degradation and pollution. Both countries are signatories of international conventions to protect biodiversity, international waters and wetlands, among others. These international commitments are reflected in national policies and legal arrangements. Through active participation in the formulation process for this project, the participating governments have demonstrated their strong commitment to taking part in the SAP preparation process and to implementing joint strategies and activities to protect common ecosystems and resources.

Global Environmental Objectives

A9. This project is a result of the participating countries' commitment to address the threats to prevent damage to the YSLME's transboundary environmental resources. The global environmental objective being pursued is to improve sectoral policies and activities that are responsible for the most serious root causes of priority transboundary environmental concerns of the Yellow Sea LME.

A10. The establishment of an LME-wide resource management regime will contribute to environmentally sustainable economic development in and around the YSLME. An ad hoc system of national level measures to manage fisheries or marine pollution will be unsuccessful when applied to a continuous natural system such as the YSLME unless a regional coordination mechanism exists. This project will establish that mechanism.

A11. The rich biodiversity of fish and other marine species in the Yellow Sea represents a major contribution to the overall biodiversity of the western Pacific Ocean and consequently to global biodiversity. In order to avoid further losses of biodiversity in the Yellow Sea, the health of this degraded ecosystem must be improved, and fisheries recovery plans agreed upon and implemented.

A12. By providing a framework for the reduction and elimination of both land and sea-based sources of contamination, the project will contribute to reductions in the levels and impacts of pollution in the global environment.

A13. This project will create the necessary conditions and framework for concerted actions to protect globally important environmental resources. The present project is consistent with the GEF Operational Strategy of April 1996, specifically with the GEF's strategic emphasis on International Waters and Biodiversity, as well as April 1997 GEF Operational Programme (#8) for waterbody-based Large Marine Ecosystems. The project will incorporate the priorities delineated in the relevant environmental agreements to which any or all of the participating countries are involved.

GEF Project Activities

A14. Under the alternative GEF scenario, the development processes and forces are re-shaped in order to safeguard the globally important environment. This would be accomplished by GEF provision of catalytic support for incremental costs associated with the formulation of the Transboundary Diagnostic Analysis (TDA), National Yellow Sea Action Plans (NYSAPs), and a Strategic Action Programme (SAP) for the Yellow Sea. The SAP will consist of a set of legal, policy and institutional reforms and investments, to address the priority transboundary concerns identified in the TDA/SAP process.

A15. In particular, the project will provide technical assistance to strengthen both national and regional capacities for the preparation of the TDA and SAP and even more importantly to implement the SAP. The SAP will ensure the cost-effectiveness of joint efforts made by the participating countries. In addition, cooperative programmes in data sharing and legislative reforms will be conducted to enhance regional collaboration to implement the SAP.

A16. The incremental cost of the alternative activities of this project will ensure that all plans and investments will be designed with global environmental considerations in mind.

A17. The GEF alternative would support a regionally led initiative to promote the management and conservation of the coastal and marine resources of the Yellow Sea LME. It would greatly facilitate the abilities of co-operating countries to address transboundary environmental issues and common natural resources management concerns at the regional level. The GEF alternative would allow for the realization of a dynamic action oriented work programme for the preparation and implementation of the SAP, to be undertaken on an accelerated basis with support from a variety of sources. These goals would be realized through support for the following specific immediate project objectives:

1. **Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture**
   This component will summarize knowledge of the status of fisheries stocks, including legislation and regulatory mechanisms; create common regional methodologies and database for fisheries, including pilot projects; develop regional agreements, national laws and regulations, and fisheries management plans; develop and demonstrate sustainable mechanism for effective fisheries management.

2. **Propose and Implement Effective Regional Initiatives for Biodiversity Protection**
   This component will summarize status of biodiversity in the YSLME, and laws and regulation addressing biodiversity; develop regional strategy for Protection of Biodiversity in the YSLME; prepare and implement regional Biodiversity Plan and investment strategy.

3. **Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality & Protect Human Health**

   This component is designed to collect data through special investigations to fill in the gaps for the regional assessment and to set priorities for transboundary environmental issues in the region during the TDA process; identify corrective measures and long term strategies including investment strategies for remediation; establish a contaminant and ecological monitoring system for the long-term success of SAP and NAP implementation.

4. **Develop and Pilot Regional Institutional and Capacity Building Initiatives**

   This component will create a functioning network of institutions and individuals to address the YSLME environmental issues and root causes; will identify the process for evolving institutional arrangements from the support of the GEF to ownership by Region; and develop strategies to sustain the effective network of institutions and individuals to address the YSLME environmental issues and root causes.

A18. This project has leveraged approximately **US$ 8,914,065** from governments to finance the identification of GEF/SAP focal points, provide logistical support and personnel, set-up institutional arrangements, sourcing of information, and support for consultations, meetings and missions. The participating states have provided estimates of their co-financing to the project as follows:

China	US$	6,891,565
ROK	US$	2,022,500

Total	**US$**	**8,914,065**

A19. In addition to this baseline and co-financing, ongoing activities by UNDP in the region will contribute to the YSLME programme. In particular, UNDP funding for a "Marine Environmental Survey of the Yalu River" (at $650,000), plus UNDP co-financing for the GEF EAS project including an ICM demonstration site in DPRK, brings a total UNDP co-financing of $1.388 million. Objectives 1,3,6,7, and 10 of the EAS project will contribute directly to the goals of the YSLME project.

System Boundary

The area of intervention is defined as follows:

A20. The countries noted that the Bohai Sea, from a scientific point of view, may be considered as a part of the YSLME. However, since numerous ongoing complementary activities are now taking place in the Bohai Sea (such as the East Asia Seas GEF Project demonstration site, the GEF Ballast Water demonstration site at Dalian, and a large ADB project on Coastal Zone Management for the Bohai Sea), the Bohai Sea is not included in the geographic scope of the YSLME GEF Project. The Meeting agreed that the PRC will make available to the YSLME ecological and environmental data from the adjacent Bohai Sea, including in particular data from EAS and ADB projects, that may help understand the interactions between the Bohai Sea and the YSLME.

A21. For the purposes of this GEF project, the Yellow Sea LME intervention is defined by:

- to the south, the line connecting the north bank of the mouth of the Chang Jiang (Yangtze River) to the south side of Cheju ;
- to the east, the line connecting Cheju Island to Jindo Island along the coast of the ROK; and
- to the north, the line connecting Dalian to Penglai (on the Shandong Peninsula).

A22. The coastal/upland boundary within the drainage basins is defined at the mouths of the major rivers (as conduits of contaminant input to the YSLME), whereas coastal zones are defined according to existing national programs.

Annex A. Incremental Cost Matrix

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**A.** Stock assessment	Baseline	16,130,873	Stock assessment information is lacking, limited, or outdated in most countries. Irregular trawl and acoustic surveys exist in national waters.	Lack of reliable statistics on the regional stocks of major commercial fishes. Assessment of transboundary stocks is practically non-existent. Threatened and endangered migratory species are protected on a very small scale.
		Alternative	18,839,445	Increased baseline information and strengthened national capacity for sustainable fisheries management. Regional Stock Assessment	Sustainable use of transboundary stocks, building on sound stock assessment and region-wide monitoring. Effective mechanism for regional annual stock assessment.
		Increment GOV Co-finance GEF Co-finance	1,062,500 1,646,072		
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**B**. Carrying capacity in fisheries and mariculture	Baseline	963, 855	Limited capabilities and technologies for assessing the carrying capacity of the YSLME.	Lack of regional carrying capacities analysis.
		Alternative	1,270,497	Increased baseline information on carrying capacity. State-of-the-art-knowledge on carrying capacity analysis.	Performed re-iterative series of regional analysis of carrying capacity. Mechanism for annual regional carrying capacity determination.
		Increment GOV Co-finance GEF Co-finance	80,000 226,642		
I. Develop Regional Strategies for Sustainable Management of Fisheries, and	**C.** Mariculture production	Baseline	58,579,267	Poorly planed and managed unsustainable mariculture in both countries. Lack of baseline data.	Lack of any regional approaches. No common methodology, regulations, or agreements. Lack of data on transboundary effects.
		Alternative	59,715,762	Increased baseline information on status and trends in mariculture. New mariculture techniques. Pilot demonstration projects in place.	Joint applied research programme for mariculture.

Mariculture		Increment GOV Co-finance GEF Co-finance	 963,855 172,640		

Annex A. Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**D**. Disease in mariculture	Baseline	446, 747	Lack of baseline data. Insufficient information on the state-of-knowledge of disease in mariculture, particularly on emerging diseases.	Lack of communication about new diseases, diagnoses, and control techniques.
		Alternative	567,497	Increased baseline information of disease in mariculture, particularly on emerging diseases.	Regional early-warning system about new diseases to reduce transboundary implications.
		Increment GOV Co-finance GEF Co-finance	 N/A 120,750		
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**E.** Regional Fisheries agreements and National laws	Baseline	45,833	National fisheries legislation exists in all countries, but capacity for enforcement is weak in most cases.	Bilateral and multilateral agreements are not complete. No regional fisheries agreements or convention in place.
		Alternative	121,583	National fisheries laws and regulations strengthened and enforced	Developed and endorsed bilateral or regional agreement for sustainable use of fisheries resources.
		Increment GOV Co-finance	 N/A		
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**F**. Fisheries Management plan	Baseline	N/A	Lack of sustainable mechanism for effective fisheries management	Lack of regional fisheries management plan
		Alternative	75,000	Strengthened national capacity for effective fisheries management.	Improved fisheries management in the YSLME. Sustainable use of transboundary stocks building on management plans.
		Increment GOV Co-finance	 N/A		

I. Develop Regional Strategies for Sustainable Management of Fisheries and Mariculture	Total ROK	GOV Co-finance	1,142,500		
	Total PRC	GOV Co-finance	2,722,891		
	Total Objective	GOV Co-finance	3,865,391		

Annex A Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**A.** Habitat conservation	Baseline	14,754,821	Risk assessment information on vulnerable habits and biodiversity threats is lacking, limited, or out of date in both countries. Countries have plans for protected areas, but capacity for enforcement is weak in most cases.	Urgent need for a comprehensive overview on the state of regional habitat. No regionally coordinated strategies of conservation and restoration of habitats exist.
		Alternative	15,056,233	Increased baseline information on existing national status and practices of coastal habitat use, conservation, and restoration. National biodiversity conservation programmes in accordance with NEAP's. Institutional strengthening through training.	Implemented Regional Strategy for Conservation Areas, including identification of priority locations for the creation of new protected areas. Conservation of habitats of global significance. Regional network of protected areas as a part of global scenario.
		Increment GOV Co-finance	 N/A		
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**B.** Vulnerable species	Baseline	N/A	Risk assessment information on vulnerable species and threats is lacking, limited, or out of date in most countries. Most of the countries have plans for protection of endangered species, but capacity for enforcement is weak in most cases.	Lack of reliable information of vulnerable transboundary species. Lack of regionally coordinated strategies for protection of vulnerable species
		Alternative	155,600	Increased baseline information on existing status of vulnerable species and vulnerable tropic linkages. National biodiversity conservation programmes in accordance with NEAP's. Institutional strengthening through training.	Implemented regionally coordinated strategies for protection of vulnerable species. Conservation of species of global significance.
		Increment GOV Co-finance	 N/A		
II. Propose and Implement Effective Regional Initiatives for	**C.** Genetic diversity	Baseline	2,561,666	Lack of national situations of genetic degradation of important bio-resources.	Lack of regional consensus on the requirements for conservation of gene pool.
		Alternative	2,910,666	Increased baseline information of genetic degradation of important bio-resources.	Implemented recommendations for conservation of specific gene pool.

Initiatives for Biodiversity Protection		Increment GOV Co-finance	N/A		

Annex A: Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**D.** Introduced species	Baseline	N/A	Lack of baseline data on the introduced exotic species and their pathways. Uncertainties on impacts and risks.	Lack of regional data on introduced exotic species. No regulations or control in place.
		Alternative	217,368	Increased baseline information on introduced exotic species and their pathways, assessment of impacts and risks. National rules for regulations and control of exotic species.	Identified actions to mitigate threats from possible introduction of exotic species to the YSLME transboundary biodiversity.
		Increment GOV Co-finance	 N/A		
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**E.** Biodiversity Regulations	Baseline	N/A	Basic regulations for the biodiversity protection exist in both countries, but capacity for enforcement is weak in most cases. Lack of information on effectiveness of protected measures.	Both countries are signatory of CBD, CITES, Bonn, and Ramsar conventions. Lack of regional agreements or convention on the biodiversity protection of the YSLME.
		Alternative	121,140	Reviewed national regulations and effectiveness of protected measures. Strengthen existing laws and regulations. Adoption of new laws.	Regionally coordinated strategies for biodiversity protection developed and implemented. Regional agreements in place.
		Increment GOV Co-finance	 N/A		
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**F.** Regional Biodiversity assessment and regional Biodiversity Action Plan	Baseline	602,410	Biodiversity action plans exist in both countries. Lack of national YSLME biodiversity protection priorities.	No regional approaches developed.
		Alternative	708,170	Clarified national YSLME biodiversity protection priorities. Improve, through training, national institutions for implementation of national YSLME action plans.	Regional Biodiversity Action Plan, including investment strategy, implemented.
		Increment GOV Co-finance	 N/A		

Annex A Incremental Cost Matrix (continued)

Component	Sub-component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**Total ROK**	GOV Co-finance	0		
	Total PRC	GOV Co-finance	1,759,036		
	Total Objective	GOV Co-finance	1,759,036		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**A.** Stressors to Ecosystem	Baseline	21,751,544	Uncertainties regarding the status and pathways of natural and human-induced stressors to the ecosystem. Lack or weakness of legal measures to reduce the stress to the ecosystem	Lack of regionally agreed approaches and methodologies to assess and rank stressors to the YSLME. Lack of regional legal measures to reduce the stress to the ecosystem.
		Alternative	21,913,684	Natural and human-induced stresses on the ecosystem identified and ranked. Identified data and information gaps.	Corrective measures to minimize the human-induced stress identified and implemented. Regional policies and legal measures identified and implemented.
		Increment GOV Co-finance GEF Co-finance	 N/A 162,140		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**B.** Carrying Capacity of Ecosystem	Baseline	N/A	State of the Environment Reports, including national coastal and marine areas. Lack of transboundary approach to the YSLME environmental problems. Insufficient information on new and innovative technologies to assess the ecosystem.	Lack of regional understanding to coordinate joint actions to reduce or prevent transboundary impacts.
		Alternative	908,760	Assessment of carrying capacities of the ecosystem. Identification of root causes of environmental degradation on the YSLME and possible mitigation actions.	Establishment of regional scientific and technical framework for monitoring the changing status of YSLME and its transboundary impacts.

		Increment GOV Co-finance GEF Co-finance	 480,000 428,760		

Annex A Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**C.** Contaminant Inputs	Baseline	36,667	Existing national capacities for effective marine contaminant reduction and mitigation are usually weak and poorly focused. No common standards or guidelines developed.	Lack of regional capacities for effective marine contaminant reduction and mitigation; poor regional interaction.
		Alternative	198,079	Strengthen national capacities for effective marine contaminant reduction and mitigation.	Regional system of effective marine contaminant reduction and mitigation. Regional quality and assurance system established.
		Increment GOV Co-finance GEF Co-finance	 N/A 161,412		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**D.** Contaminant Levels	Baseline	11,879,478	Existing national monitoring capabilities are usually weak and poorly focused. No common standards or guidelines developed. Increased baseline information on contaminants and nutrient levels.	Lack of regional monitoring networks and poor regional interaction. Absence of regional legal agreement to mitigate contamination
		Alternative	12,299,798	Fully operational, upgraded, and strengthened national monitoring system in each country. Highly qualified trained staff. Ratification and implementation of international conventions by each country.	Network of monitoring centres throughout the region. Reliable data to catalyze reduction of existing and prevention of new types of contamination.
		Increment GOV Co-finance GEF Co-finance	 320,000 100,320		

III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**E.** Harmful Algal Blooms and Emerging Disease	Baseline	11,224,759	Lack of baseline data on HAB's and emerging disease and their impact on bio-resources and human health.	Lack of regional monitoring capabilities to assess HABs and emerging diseases in YSLME. No management and mitigation strategies.
		Alternative	11,383,399	Increased baseline information on HAB's and emerging diseases. Comparative analysis of cause patterns and impacts on bio-resources and human health. Strengthened institutions through training.	Established a well-functioning monitoring network for HAB's and emerging diseases. Regional management and mitigation strategies developed and implemented.
		Increment GOV Co-finance GEF Co-finance	 N/A 158,640		

Annex A Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**F.** Hot Spots Analysis	Baseline	7,794,608	Lack of common methodologies to identify and rank hot spot sources and non-point sources of water quality degradation. Insufficient funding and knowledge base. Lack of sufficient baseline data.	Lack of regionally adopted procedures for remediation and prevention. Insufficient funding base.
		Alternative	8,093,888	Strengthen national capabilities to determine and rank hot spot sources of water quality degradation.	Regional procedures for remediation and prevention adopted. Financial resources secured.
		Increment GOV Co-finance GEF Co-finance	 N/A 299,280		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**G.** Emergency Planning And Preparedness	Baseline	155,000	National network for emergency response exist, and contingency plans are developed but the implementation is poor. Insufficient funding base.	Regional coordination for emergency response remains underdeveloped.
		Alternative	306,320	National marine pollution preparedness, response, and contingency plans enforced.	Major reduction in risks of regional environmental degradation. YSLME Regional contingency plan. Strong regional network of responsible authorities.
		Increment GOV Co-finance GEF Co-finance	 N/A 151,320		
III. Propose and Implement Actions to Reduce Stress	**H.** Legal and Regulatory	Baseline	33,333	All countries in the Region have some form of legal framework for the protection of their own coastal and marine environments, but enforcement is poor.	No regional coordinating mechanisms exist, perhaps in the absence of regional legal documents. Both countries have ratified several international convention and agreements.

to the Ecosystem, Improve Water Quality and Protect Human Health		Alternative	113,093	Legal framework for addressing transboundary problems established. Institutions strengthened through training in environmental planning and management.	Existing national and international laws and conventions surveyed. Coordinated proposals drafted for improved water quality legislation and regulation.
		Increment GOV Co-finance GEF Co-finance	 N/A 79,760		

Annex 1: Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**I**. Fate And Transport Analysis To Facilitate SAP Analysis	Baseline	1,440,612	Poor understanding of fate and transport of contaminants. Limited modeling capabilities.	Lack of regional strategies to assess the fate, transport, and risks of contaminants and nutrients.
		Alternative	1,793,452	Increased baseline information of fate and transport of contaminants and nutrients. Strengthened national capabilities through training.	Performed fate and transport analyses for management and policy development, including EIA process and ICZM. Regional training activities for environmental risk assessment implemented.
		Increment GOV Co-finance GEF Co-finance	 N/A 352,840		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality, and Protect Human Health	**Total ROK**	GOV Co-finance	800,000		
	Total PRC	GOV Co-finance	1,759,036		
	Total Objective	GOV Co-finance	2,559,036		
IV. Develop and Pilot Regional	**A.** Stakeholders Involvement	Baseline	N/A	Stakeholders involvement in the environmental management and decision-making process is weak	Awareness programmes in the individual countries rarely cover regional issues.

Institutional and Capacity Building Initiatives		Alternative	316,500	Identified and strengthened capacities for stakeholders' involvement in the YSLME	Effective involvement of stakeholders in environmental and resource management, as well as the decision-making process, to address the YSLME environmental issues and root causes.
		Increment GOV Co-finance GEF Co-finance	 N/A 316,500		

Annex A Incremental Cost Matrix (continued)

Component	Sub-component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**B.** Regional coordination	Baseline	187,500	Lack of regional coordination mechanism.	Some form of regional cooperation between each country's Ministries of Environment.
		Alternative	3,374,791	Effective co-ordination and implementation of national activities, as well as integration of these environmental activities into national policies and investment programmes. Strengthened institutional and human capacity through training and active involvement of national experts in the TDA and SAP preparation.	Effective regional coordination mechanism for the YSLME sustained through regional agreements
		Increment GOV Co-finance GEF Co-finance	 N/A 3,187,291		
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**C.** National Institutions	Baseline	963,855	Lack of ability to contribute to environmental management and decision-making.	Some form of regional cooperation between national institutions in both countries. Joint oceanographic programme. Lack of sustainable contributions to the YSLME
		Alternative	2,094,477	Strengthened national institutions, as well as enhanced ability to contribute to environmental management and decision-making.	Effective regional network of institutions to address the YSLME environmental issues and root causes.
		Increment GOV Co-finance GEF Co-finance	 650,602 480,020		
IV. Develop and Pilot Regional	**D.** Financial Instruments	Baseline	N/A	Insufficient financial support for the protection and rehabilitation of the YSLME.	No regional investment strategy developed.

Institutional and Capacity Building Initiatives		Alternative	3,007,840	Improved national capacities and training in environmental project identification and preparation. Small environmental grants programme developed, with priority investment projects developed for each country.	Implemented pre-feasibility studies of promising technologies and industries to help achieve the goals of the YSLME, to create an investment portfolio (Priority Investment Portfolio). Long term environmental investment to implement the SAP and NYSAP's established
		Increment GOV Co-finance GEF Co-finance	 N/A 3,007,840		

Annex A Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**E.** Data and Information Management	Baseline	734,362	Countries in the region have national environmental data centres, and some have GIS. Data for the YSLME are stored in different institutions. No information or decision support system available.	Data and information exchange between countries is weak. No regional data centres. No regional quality assurance.
		Alternative	1,197,892	Strengthening or creation of national environmental data centres and institutions through provision of equipment, training, and networking. Easy and reliable access to electronic means of communication, data, and information exchange. Stakeholders trained and willing to use GIS and Information systems.	Regional YSLME Networking Information System including data on Institutional capacities, scientists, environmental projects, environmental data sets in the region, and GIS, accessible via Internet to the world community. High quality, reliable data on YSLME environmental issues. Sustainable regional mechanism for DIM for effective management of the YSLME.
		Increment GOV Co-finance GEF Co-finance	 80,000 383,530		
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**F.** Public Awareness And Participation	Baseline	11,776,667	Some form of environmental public awareness and participation exists. Few active environmental NGO's addressing YSLME problems. Public participation in resource management and coastal development decisions is not sufficient.	Awareness programmes in the individual countries rarely cover regional issues.
		Alternative	12,267,827	Increased environmental awareness at the national and community levels. Local environmental NGO's and community groups obtain grants to carry out projects.	Increased public awareness and support for regional environmental issues. Enhanced overall effectiveness of environmental awareness programmes through the organization of concerted region-wide activities, as well as exchange of lessons learned through an active regional network of NGO'ss and community groups.

		Increment GOV Co-finance GEF Co-finance	 N/A 491,160		
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**Total ROK**	GOV Co-finance	80,000		
	Total PRC	GOV Co-finance	650,602		
	Total Objective	GOV Co-finance	730,602		

Annex A: Summary Incremental Cost Matrix

Objective	Component	Baseline (B)	Alternative (A)	Increment (A-B)	
				Governments	GEF
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	A. Stock Assessment	16,130,873	18,839,445	1,062,500	1,646,072
	B. Carrying Capacity in Fisheries and Mariculture	963,855	1,270,497	80,000	226,642
	C. Mariculture Production	58,579,267	59,715,762	963,855	172,640
	D. Disease in Mariculture	446,747	567,497	N/A	120,750
	E. Regional Fisheries Agreements and National Laws	45,833	121,583	N/A	75,750
	F. Fisheries Management Plan	N/A	75,000	N/A	75,000
	Total ROK	59,764,166		1,142,500	
	Total PRC	16,402,409		2,722,891	
	Total Objective	76,166,575	82,348,820	3,865,391	2,316,854
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	A. Habitat Conservation	14,754,821	15,056,233	N/A	301,412
	B. Vulnerable Species	N/A	155,600	N/A	155,600
	C. Genetic Diversity	2,561,666	2,910,666	N/A	349,000
	D. Introduced Species	N/A	217,368	N/A	217,368
	E. Biodiversity Regulations	N/A	121,410	N/A	121,140
	F. Regional Biodiversity Assessment & Regional Biodiversity Action Plan	602,410	708,170	N/A	105,760
	Total ROK	16,111,668		0	
	Total PRC	1,807,229		1,759,036	
	Total Objective	17,918,897	20,928,213	1,759,036	1,250,280
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality, and Protect Human	A. Stressors to Ecosystem	21,751,544	21,913,684	N/A	162,140
	B. Carrying Capacity of Ecosystem	N/A	908,760	480,000	428,760
	C. Contaminant Inputs	36,667	198,079	N/A	161,412
	D. Contaminant Levels	11,879,478	12,299,798	320,000	100,320
	E. Harmful Algal Blooms and Emerging Disease	11,224,759	11,383,399	N/A	158,640
	F. Hot Spots Analysis	7,794,608	8,093,888	N/A	299,280
	G. Emergency Planning and Preparedness	155,000	306,320	N/A	151,320
	H. Legal and Regulatory	33,333	113,093	N/A	79,760
	I Fate and Transport Analysis to Facilitate SAP Analysis	1,440,612	1,793,452	N/A	352,840
	Total ROK	13,809,977		800,000	
	Total PRC	40,506,024		1,759,036	
	Total Both Objective	54,316,001	58,769,509	2,559,036	1,894,472

Annex A Summary Incremental Cost Matrix (continued)

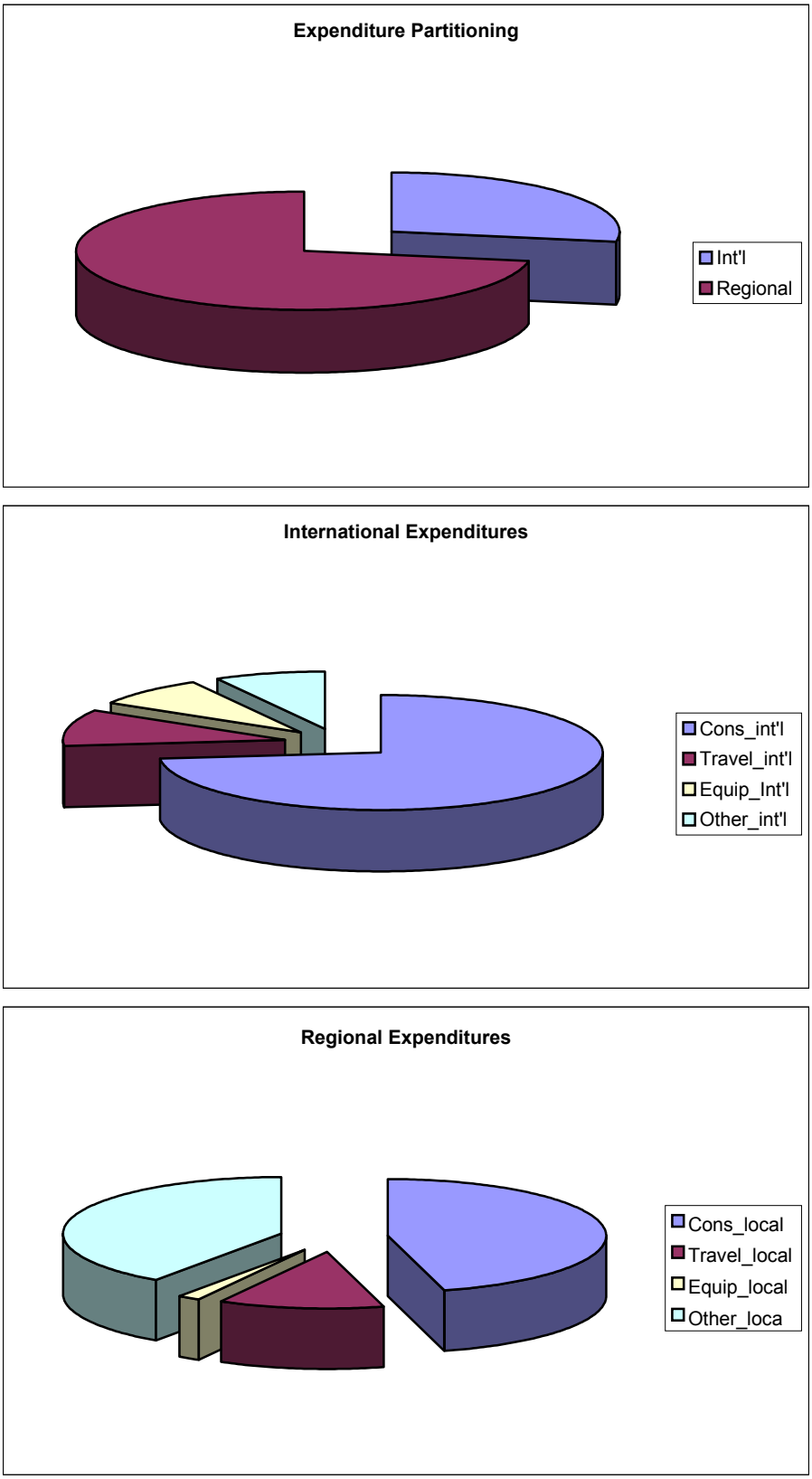
Objective	Component	**Baseline (B)**	**Alternative (A)**	**Increment (A-B)**	
				Governments	**GEF**
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	A. Stakeholders Involvement	N/A	316,500	N/A	316,500
	B. Regional Coordination	187,500	3,374,791	N/A	3,187,291
	C. National Institutions	963,855	2,094,477	650,602	480,020
	D. Financial Instruments	N/A	3,007,840	N/A	3,007,840
	E. Data and Information Management	734,362	1,197,892	80,000	383,530
	F. Public Awareness and Participation	11,776,667	12,267,827	N/A	491,160
	Total ROK	12,180,457		80,000	
	Total PRC	1,481,927		650,602	
	Total Both Objective	13,662,384	22,259,327	730,602	7,866,341
	Total	162,063,857	184,305,869	8,914,065	13,327,947

PDF-B: 349,650 US$

Project Support Costs: 1,066,236 US$

Total Project Costs: 14,743,833 US$

Figure A-1: Allotment of GEF Incremental Financing for YSLME Project



Component	Intervention Logic	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
	Long-term development / environment Objectives: environmentally-sustainable management and use of the YSLME 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	0.1 Defined regional ecosystem; management framework implemented by year; 0.2 Improvements in catch-per-unit effort by year 5; 0.3 Improved water quality for target contaminants by year 5; 0.4 Reversal in trend of proliferation of HABs by year 5; 0.5 Loss of Biodiversity slows by year 5; 0.6 Final TDA prepared and agreed, end of year 2; 0.7 Strategic Action Programme (SAP) formulated and endorsed at ministerial level in each country, end of year 4; 0.8 Yellow Sea Large Marine Ecosystem National Action Plans (YSNAPs) for each country formulated and endorsed by end of year 3; 0.9 Agreed set of indicators (process, stress reduction, environmental status) to monitor progress of SAP implementation by end of year 4.	Steering Committees (SC) annual reports; PCU documents; PCU and technical reports; Working groups reports; Interministerial Coordinating Committee reports; For Biodiversity, pentadal census.	Assume continued national commitment to the regional program at each sector level, including offer of national resources. The ability of the SC and PCU to formulate and implement community-based solutions relies on the support of national agencies through coordinated (but independent) actions. The GEF project will create a model that can be adopted in the future as a permanent activity of the individual national sectors. Broad Stakeholder Participation.
	Project purpose: Formulation of a Transboundary Diagnostic Analysis (TDA) , National Yellow Sea Action Plans and a Strategic Action Programme (SAP). Facilitation of the initial steps of the implementing SAP to manage shared marine resources and achieve sustainable development for the Yellow Sea Large Marine Ecosystem. Develop a mechanism to objectively measure effects of management actions		TDA published and broadly disseminated; Countries endorse SAP; National and donor commitments to financing SAP and YSNAP implementation; PCU and technical reports.	Remedial actions can be costly and/or unpopular in some sectors. A well-designed monitoring program will provide objective technical information with which to assess the success (or failure) of specific management actions and can be used to adjust future actions.

ANNEX B. LOGFRAME MATRIX (continued)

Objective I. FISHERIES/MARICULTURE		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
OUTPUTS	**TDA** • 1.1 Summary of existing state of knowledge	Delivery of report by end of yr2	Project files	
	• 1.1 Identification of legislative gaps		Working group reports.	
	SAP • 1.2 Draft fisheries management plans			
	• 1.2 Draft regional agreement for fisheries management	Draft disseminated to regional stakeholders and governments by end of yr3		
	• 1.2 Drafts of strengthened national fisheries laws			
	• 1.2 Fisheries database		Working group reports.	
	• 1.3 Pilot projects	Database outputs used by NCUs by end of yr3	NCU records	
	SAP IMPLEMENTATION • 1.2 Regional agreement			
		Endorsed by governments by end of yr4	Interministerial Coordinating Committee reports	

ACTIVITIES	A. Stock Assessment • 1.1 Review existing data and diagnose condition of stocks • 1.1 Perform demonstration of regional survey • 1.2 Develop common methodology for joint regional stock assessment • 1.2 Perform initial joint regional stock assessment • 1.2 Create mechanism for regional annual stock assessment	Fisheries stocks status reports. Equipment purchased by yr1 Survey results written up by end of yr2 Methodology for joint regional stock adopted by both countries by end of yr3 Assessment published by end of yr1 Assessments are undertaken annually by end of yr5	Project files Working group reports. Procurement records of PCU Project files Publication reference provided by PCU	The countries will agree to perform a joint stock assessment. The risk is low since this is one of their priority actions identified during the PDF-B phase. Relies on political will to find ongoing regional efforts.
	B. Assessing Carrying Capacity • 1.1 Review existing knowledge and identify gaps • 1.1 Complete knowledge gaps • 1.1 Perform iterative series of analysis • 1.2 Undertake annual carrying capacity determination	Report published and widely distributed. Analysis results available to PCU by end of yr3 Carrying capacity estimates published annually after yr3	Publication reference provided by PCU Working group reports. Project files Government or regional body publication records Interministerial Coordinating Committee reports	Carrying Capacity gaps defined and process developed to fill in knowledge gaps. Regional agreements on methodology to assess carrying capacity. Relies on political will to find ongoing regional efforts.

	C. Mariculture Production • 1.1Review existing status and trends • 1.2 Develop joint research program • 1.3 Undertake pilot demonstrations • 1.3 Assist region to implement mariculture techniques	Scientific reports published. Progress reports completed annually. First reports of joint research programme published by end of yr5.	Project files Working group reports. Interministerial Coordinating Committee reports	Existing status and trends reviewed regularly. Full stakeholder participation to ensure acceptability of new mariculture techniques.

ANNEX B. LOGFRAME MATRIX (continued)

Objective I. FISHERIES/MARICULTURE		**Objectively Verifiable Indicators**	**Sources of Verification**	**Assumptions and Risks**
ACTIVITIES (CONT')	D. Disease in Mariculture • 1.1 Review existing knowledge • 1.1 + 1.3 Develop and demonstrate new technology for diagnosis, prevention and control • 1.2 Facilitate communication	Progress reports completed annually. Countries agree to use new technology by end of yr3. Early-warning system operative by end of yr5	Project files. Working group reports. Interministerial Coordinating Committee reports	Joint development and demonstration of new technology between countries, which results in increased communication regarding emerging diseases, diagnosis, and control. Full Stakeholder participation.
	E. Regional Agreements and National Laws • 1.1 Review existing national laws and international agreements • 1.2 Develop regional agreement for sustainable use of fisheries resources • 1.2 Propose measures for strengthening laws	Status report published. Regional agreement endorsed by end of yr3 New laws enacted nationally by end of yr5.	Project files. Interministerial Coordinating Committee reports. Parliament records and NCU files.	Commitment of countries to development and endorsement of regional agreements, as well as the strengthening of existing regulations.
	F. Management Plan • 1.2 Develop regional fisheries management plans • 1.3 Implement plans	Status report published by end of yr2. Country endorsement and implementation of management plan by end of yr5	Project files. Interministerial Coordinating Committee reports.	Maintenance of sustainable fish populations will require the reduction of system stresses, including chemical contamination and fishing pressure. Such remedial actions directly affect individuals or organizations now doing business in the region and early identification/ education of stakeholders will be necessary for compliance with these actions. Some mechanism to compensate the affected stakeholders must be found to gain their cooperation.

OBJECITVE: II. BIODIVERSITY PROTECTION		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
OUTPUTS	**TDA** • 2.1 Regional biodiversity assessment. • 2.1 List of existing legal and regulatory frameworks for biodiversity in the YSLME. **SAP** • 2.2 Regional Biodiversity Action Plan, including Regional Strategy for Conservation Areas, regional strategies for protection of vulnerable species, and regional consensus on the conservation of gene pool. • 2.2 Investment strategy. • 2.2 Proposals for regulation and control of exotic species. **SAP IMPLEMENTATION** • 2.2 New laws for regulation and control of exotic species identified. • 2.3 Funded biodiversity projects responding to the priority actions of the Regional Biodiversity Action Plan.	Delivery of assessment by end of yr2. List prepared by end of yr1. Action Plan and investment strategy endorsed by government by end of yr3. New laws passed by relevant government mechanisms by end of yr4 Signed project documents, or evidence of financial commitment from govts, for Regional Strategy actions by end of yr5	Project files Working group reports. Interministerial Coordinating Committee reports Parliament records Copies of project documents or govt. commitment on project files.	
ACTIVITIES	A. Habitat Conservation • 2.1 Review existing practices • 2.2 Develop regionally coordinated strategies • 2.3 Implement Regional Strategy for Conservation Areas	Regional Strategy for Conservation Areas adopted by end of yr3. 5 new protected areas identified by end of yr2. Signed project documents, or evidence of financial commitment from govts, for Regional Strategy actions by end of yr5	Copy of signed strategy on project files. Acknowledgement of new protected areas by relevant Ministries. Interministerial Coordinating Committee reports. Copies of project documents or govt. commitment on project files.	Countries adopt regional strategy, and financial mechanisms are identified.
	B. Vulnerable Species. • 2.1 Conduct national review of status	National review completed by end of yr2. Strategies for protection of vulnerable species adopted by SC and endorsed by relevant Ministries by end of yr3	Project files. SC minutes.	Regional agreement is reached in line with national priorities. The risk in minimized since both countries have ratified several international conventions for protection of vulnerable species.

ANNEX B. LOGFRAME MATRIX (continued)

OBJECTIVE: II. BIODIVERSITY PROTECTION		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACTIVITIES (CON'T)	D. Introduced Species • 2.1 Document introduced exotic species • 2.2 Develop proposals for regulation and control. • 2.3 Implement strategy for regulation and control	Documentation completed by end of yr2 Ballast water treatment and prevention agreement ratified and distributed by end of yr4. Signed project documents, or evidence of financial commitment from govts, for implementation of regulatory strategy by end of yr5.	Project files. Ratification of agreement gazetted by protocol/convention secretariat. Copies of project documents or govt. commitment on project files. Interministerial Coordinating Committee reports	Proposals for regulation and control of exotic species agreed upon countries (and/or countries adopt and ratify anticipated new IM ballast water protocol or convention)
	E. Regulations. • 2.1 Review national regulations and assess effectiveness • 2.2 Develop regionally coordinated strategies	Review completed by end of yr1. Biodiversity conservation agreement signed and ratified by end of yr3.	Project files. Copy of signed agreement on project files. Interministerial Coordinating Committee reports	Effective environmental resource protection derives from combination of regulatory and non-regulatory actions. Bef recommendations for effective regulatory changes can be made survey of existing national and international regulations needs to performed.
	F. Regional Assessment and Regional Biodiversity Action Plan • 2.2 Coordinate above activities into a biodiversity assessment, Regional Biodiversity Action Plan, and investment strategy.	see indicators for OUTPUTS		Ratification of the Regional Biodiversity plan. The risk is minimi since both countries have ratified the CBD. Donors' commitments secured.

ANNEX B. LOGFRAME MATRIX (continued)

		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
OUTPUTS	**TDA** • 3.1 Data on identified stresses **SAP** • 3.2 Proposals for upgrading the regional monitoring network **SAP IMPLEMENTATION** • 3.2 Regional planning and preparedness strategies	Reports completed by end of yr2 Proposals submitted to potential donors by end of yr4 Funding identified by end of yr5.	Working group reports. Project files. Letters of intent/commitment from countries and donors.	
ACTIVITIES	A. Stressors to Ecosystem • 3.2 Identify and rank stresses • 3.2 Identify corrective measures • 3.2 Identify policies and legal measures • 3.2 Develop strategy for long-term sustainability of investments • 3.3 Implement corrective measures	Technical report published by end of yr2 Progress reports published annually	Working group reports.	Once data and information gaps are identified, implementation of r measures to reduce stressors will take place.

	B. Carrying Capacity of the Ecosystem • 3.1 Assess carrying capacities under changing stresses • 3.1 Identify information gaps • 3.2 Develop strategies for monitoring changes • 3.1 Prepare state-of-ecosystem reviews and reports • 3.3 Facilitate implementation of strategies	State of the environment report published by end of yr5.	Working group reports.	Regional strategies must be developed for monitoring the chang status of the ecosystem. Countries will have to facili implementation of new strategies for constantly improving ecosystem. New carrying capacity methodology must be developed and agr regionally.
	C. Contaminant Inputs • 3.1 +3.3 Assess and monitor contaminant and nutrient levels • 3.2 Develop regional priorities and strategies to reduce levels • 3.3 Facilitate implementation of strategies	[Regional quality control and assurance system establishedby end of yr2. Annual contaminant input reports published.	Working group reports Project files. Letters of intent/commitment from countries and donors.	Countries will have to agree upon regional priorities and strategies reduce contamination to sustainable levels, including promot activities which involves sharing new developments and technologi
	D. Contaminant Levels • 3.1 Develop baseline data • 3.2 Develop regional monitoring network strategy • 3.2 Develop funding mechanism to implement monitoring strategy	Monitoring data reports and annual reports published. Donors and country commitments to the regional monitoring network confirmed by end of yr5.	Working group reports Project files Letters of intent/commitment from countries and donors.	A well-designed monitoring program will provide objective techn information with which to assess the success (or failure) of spec regional management actions and can be used to guide future acti In-country and international sources of support will need to identified and secured to assure acceptance and implementation.

ANNEX B. LOGFRAME MATRIX (continued)

		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACTIVITIES (CON'T)	E. Harmful Algal Blooms and Emerging Disease • 3.1 Undertake comparative analysis of causes and impacts • 3.3 Monitor HABs • 3.2 Develop management and mitigation strategies • 3.3 Facilitate regional management implementation	Monitoring data reports and annual reports published. Strategies agreed upon and implementation begun by end of yr5	Working group reports Project files Interministerial Coordinating Committee reports	Countries will have to facilitate regional management and mitigat implementation of the causes, patterns, and impacts of HABs Emerging Disease on bio-resources and human health.
	F. Hot Spots Analysis • 3.2 Determine and rank hot spot sources of water quality degradation • 3.2 Develop procedures for remediation • 3.2 Develop investment strategies • 3.3 Facilitate implementation of procedures	Technical report published by end of yr2 Procedures agreed upon by end of yr3 SAP commitments to hot spot remediation confirmed by end of yr5.	Working group reports. Project files. Interministerial Coordinating Committee reports Letters of intent/commitment from countries and donors.	Facilitation of procedures for re-mediation and prevention of hot sp can result only through securing financial commitments.

	G. Emergency Planning and Preparedness • 3.1 Assess national emergency and contingency capabilities • 3.2 Develop strategies for rapid and long-term regional responses • 3.2 Facilitate regional actions to enable contingency planning • 3.2 Harmonize customs, training.	Technical reports published by end of yr2. Strategy agreed by governments by end of yr3 Regional actions discussed at SC meetings and workshops.	Working group reports. Project files. Interministerial Coordinating Committee reports. SC minutes and workshop reports.	Countries agree to cooperation on joint emergency preparedness response.
	H. Legal and Regulatory • 3.1 Review and compare national regulations and laws on water quality develop proposals for coordination of regulations • 3.3 Facilitate coordinated actions to improve legislation and regulation	Technical report published by end of yr1. Regional actions discussed at SC meetings and workshops.	Working group reports. Project files. SC minutes and workshop reports.	Countries will agree to take coordinated approach , in spite of soc economic and political differences.

ANNEX B. LOGFRAME MATRIX (continued)

		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACTIVITIES (CON'T)	I. Fate and Transport Analysis to Facilitate SAP Analysis			Governments and institutions must make available results fr previous studies, and apply existing models.
	• 3.1 Review existing understanding of fate and transport of contaminants	Technical report published by end of yr2.	Working group reports.	
	• 3.2 Develop regional assessment strategies		Project files.	
	• 3.2 Perform fate and transport analyses for management and policy development, including EIA process and ICZM	Strategies accepted by SC by end of yr3.	SC minutes.	
	• 3.3 Develop regional training activities	Analyses published by end of yr4.	Working group reports.	
		5 number of training activities held by end of yr5	Project files.	

ANNEX B. LOGFRAME MATRIX (continued)

		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
OUTPUTS	**TDA** • 4.1 Stakeholder and institutional participation strategy • 4.1 Final TDA **SAP** • 4.2 Network of local, national and regional stakeholders • 4.2 National Yellow Sea Action Plans • 4.2 Strategic Action Programme **SAP IMPLEMENTATION** • 4.3 Programme of regional and national intersectoral cooperation • 4.3 Financial mechanism to sustain public awareness	Strategy included in final TDA, which is approved by SC and UNDP by end of yr2. 500 stakeholders attend working group meetings by end of yr3. NYSAPs approved by governments by end of yr3. SAP approved by governments and UNDP by end of yr4. SAP implementation committed by countries and donors by end of yr5.	SC minutes. UNDP TPR meeting minutes. Working group reports. Interministerial Coordinating Committee reports SC minutes. UNDP TPR meeting minutes. Letters of intent/commitment from countries and donors.	
ACTIVITIES	A. Stakeholders • 4.1 Identify stakeholders and assess their capabilities for contributing to environmental management • 4.3 Strengthen stakeholder capabilities • 4.1 + 4.3 Encourage stakeholder involvement	Stakeholders identified and involved in working groups by end of yr1. 5 training workshops for stakeholders by end of yr3.	Stakeholders' participation report. Project files.	Routine and effective involvement by stakeholders in planni management and decision-making can only be accomplished by going encouragement, strengthened capacities, and financ commitment by donors and countries. Barriers to broaden stakeholder participation must be removed.

	B. Regional Coordination • 4.1 Create a functioning regional coordination mechanism • 4.2 Identify modes to sustain regional coordination mechanism • 4.3 Assist in maintaining effective regional coordination	Coordination office opened and staff hired by end of yr5. 10 regional coordination meetings held by end of yr5. Funds committed for long-term sustainability of mechanism by end of yr5.	Project files. Terms of Reference (TORs) and meeting reports. Letters of intent/commitment from countries and donors.	The program (i.e., SC and PCU) must effectively communicate issues and the suggested remedies to the national sectors and responsive to national real and perceived needs.
	C. National Institutions • 4.1+ 4.3 Strengthen capacity to contribute to environmental management and decision-making • 4.3 Facilitate ongoing management	40 institutions participate in 10 stakeholder project meetings over the life of the project	Meeting attendee lists showing national institution participation.	Financial and motivational means must be identified to develop th national institutions into sustainable contributors of the YSLME.

ANNEX B. LOGFRAME MATRIX (continued)

OBJECTIVE IV. REGIONAL		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACITIVITIES (CON'T)	D. Financial Institutions • 4.1 Develop regional small grants program • 4.1 + 4.2 Provide training • 4.3 Provide funding for pre-feasibility studies • 4.1 Identify a mechanism for participation of development banks	Priority Investment Portfolio prepared by end of yr5. Feasibility study on economic instruments completed by end of yr5.	Summary report on PIP published. Progress reports published. Project files.	Financial support for recommended actions needs to be integrated i YSLME recommendations from the beginning. While internatio and national government support is anticipated, private commerc and industrial activities must supply substantial funds to Programme.
	E. Data and Information Management • 4.1 Determine regional data and information management capabilities • 4.1 Develop regional DIM strategy • 4.3 Implement regional DIM strategy	Regional YSLME Information System including meta-level data used by 100 stakeholders per month by end of yr5. YSLME activities and data broadly disseminated via Internet.	Progress reports published. Website administration records. Distribution records of GIS available on CD and web.	Access of data and information for all Stakeholders. Government commitments to make available and distribute d broadly.

	F. Public Awareness and Information • 4.1 Develop public awareness campaign • 4.2 Demonstrate regional public awareness campaign • 4.3 Encourage ongoing public awareness	Strong Regional NGOs network established by end of yr4. Major Stakeholders participate in TDA/NYSAP/ SAP process.	Public awareness and environmental education materials (print and on-line); Reports from annual NGO forum, NGO directory (print and on-line). List of SAP contributors.	All recommendations made by the YSLME regional program remedial and resource protection action will require trade-offs and negatively affect someone. To gain cooperation and compliance, rationale for action and the real costs incurred need to be fu understood by the affected groups. YSLME needs to actively as these groups in finding support to attenuate the negative effects resulting changes.

ANNEX C STAP ROSTER TECHNICAL REVIEW

REVIEW OF "PREPARATION AND PRELIMINARY IMPLEMENTATION OF A STRATEGIC

ACTION PROGRAMME FOR THE YELLOW SEA LARGE MARINE ECOSYSTEM"

BY B.J. ROTHSCHILD

OVERVIEW

C1. The strategic plan is on target and can provide the basis for a successful project. The optimal utilization of GEF funding requires that all participants have a similar view of goals and objectives and that they perceive that the goals and objectives are attainable. In this regard the long-term objective of the project contains various phrases that are difficult to define and harder to implement: 1) ecosystem based management, 2) environmentally sustainable, 3) reducing development stress and, 4) sustainable development. In some point in the strategic planning the exact meaning of these phrases needs to be spelled out in concrete terms particularly with regard to the YSLME. It must be realized that the components of the project are very different in regard to their potential for practical results. Activities such as stock assessment, monitoring of pollution and mariculture evaluation are relatively easy to define and to relate project outputs to project inputs. Less definable and perhaps less useful *applied* results will derive from projects oriented toward projects oriented toward genetic diversity and the carrying capacity of the ecosystem. It is not that these endeavors are unimportant, rather it is that they are essentially research issues. The practical implementation of the project and the major weight of the project are loaded toward process rather than substance. That is to say that the funding allocations appear to be more weighted toward stakeholder involvement than to mariculture production, for example. There is nothing wrong with this provided that this is the clearly recognized intent of the project. It is not clear without detailed analysis whether the very expensive substance-related projects are adequately funded. With regard to the development of regional institutional and capacity building component it is not clear that sufficient resources are committed to laboratory and computer facilities and the training of technicians and scientists. At the end of the day the sustainability of the project will be measured in terms of not only

public awareness but in the scientific and technical capacities that have been developed. If the project is to avoid the pitfalls of other projects such as the Black Sea project, then it might be necessary to focus in greater detail on explicit resources and mechanisms that are devoted to the monitoring and review of project progress. If the project is to be transferable among other regions, then it is necessary to devote resources to global interchange of information.

A. GENERAL OBJECTIVES AND IDENTIFIED ISSUES

C2. The proposed project has a long-term objective***: "ecosystem-based, environmentally sustainable management and use of the yslme 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."*** The project is intended to have a five-year duration.

C3. The project narrative articulated several issues of concern implying that these relate to the long-term objectives of the project:

1. Multilateral measures for marine pollution control are particularly deficient.

2. Lack of formal infrastructure to bring about collaboration and cooperation in monitoring and research activities.

3. Implement ecosystem based management approach to reduce development stress on ecosystem and to initiate recovery actions leading to the long-term sustainability of the environment and the resources…

4. HABs are increasing and might be influence by underwater construction.
5. The Yellow Sea most intensively exploited in the world

6. Extensive aquaculture mariculture and cultivated seaweed.

7. Preventing lags such as the one that occurred in the Black Sea Programme.

B. COMPONENTS OF PROJECT APPROACH

C4. Four project components have been identified to address the objectives of the program:

1.Regional strategies for sustainable development of fisheries and aquaculture

2.Effective regional initiatives for biodiversity protection

3. Actions to reduce stress to the ecosystem improve water quality and protect human health

4. Development of regional institutional and capacity building.

C. ALLOCATION OF RESOURCES COMMITTED TO PROJECT

C5. Nearly 40 percent of the project costs are allocated to the project component *development of regional institutions and capacities.* Nearly as much has been allocated to *sustainable management*. Smaller amounts to *biodiversity protection* and *reducing stress to ecosystem*. Since these reflect the totals it is interesting to note that GEFs contribution is primarily oriented toward the development of regional institutions and capacities.

D. ADDRESSING SPECIFIC QUESTIONS

C6. D1. Scientific And Technical Soundness—The bulk of the project funds are devoted to Component IV-- building regional institutions and capacities. So the issue with regard to this particular allocation is whether it will be devoted specifically to capacity building, that is education, training, and facilities that focus on the major problems of the ylse. While some aspects of education, training, and facilities are listed in Component IV, Annex D, it appears that the weight of this component and the program as a whole are oriented to communication and coordination. I am not sure that this is the best use of the funding.

C7. Component I is generally scientifically and technically sound. However, it cannot be stressed enough that, investigating carrying capacity needs to be defined in the context of inter annual and inter decadal environ mental variability. Component II will be difficult to execute in a cost-effective way since biodiversity means many things to many people. Surely “habitat conservation” and “introduced species” will form the basis for the most relevant work. The same remark on carry capacity is appropriate in component III. It would be well to focus on contaminant input and levels as well as the specific dynamics of HABS.

C8. All in all the projects seem technically sound. The allocation between actual work and coordinative activities needs to be examined. It must be realized that biodiversity and carrying capacity issues relate more to research topics than practical studies such as aquaculture \, assessing contaminants, and stock assessment. The subject of data archival and management is a major cost and does not receive enough attention.

C9. D2. Identification of global environmental benefits and or drawbacks. The benefits are of course important for the region, which involves a significant share of the world's population. If the project meets its goals than its interaction with similar projects could generate a raising of the bar in the management of coastal ecosystems.

C10. D3. Context of GEF goals—ok

C11. D4—Regional context—what about Japan and Russia etc?

C12. D5—Replicability—good if resources are somehow put into facilitation replicability.

C13. D6—the project appears to be sustainable—it is important that it focuses on doing the work and not concentrating on coordination and communication. Coordination and communication are important. At the same time it is important to focus on substance.

C14. With regard to the secondary issues the capacity building is critical—it needs further direction.

C15. A closing comment relates to the concern about time phasing of project components—this needs to be spelled out in somewhat wore detail and specific resources need to be identified to endure timely deliver if the concern about lags is to be minimized.

C16. All in all this project seems to be on the right track.

ANNEX C1 RESPONSE TO STAP/COUNCIL/IA COMMENTS

Comments on STAP Review

C1-1. The STAP review raised several important issues that required clarification. As usual, since the Project Brief is so short, many of the details that were raised by the STAP review could not be addressed adequately in the body of the document. However, some items have been addressed in the revised Project Document. Some issues are addressed in this Annex specifically; the remainder will be addressed in the Project Document in more detail.

C1-2. Items raised by the STAP Review and specific responses include:

C1-3. 1) "Meanings of phrases need to be spelled out in concrete terms" (ecosystem-based management, environmentally sustainable, reducing development stress, and sustainable development): These terms are generally accepted terms, whose meaning depends on the actual application. As part of the Work Plan preparation during the Implementation Phase of the YSLME, these terms will be clarified and the manner in which components, sub-components, and activities will relate to these terms will be transparent.

C1-4. 2) "The practical implementation of the project and major weight of the project are weighted more towards process rather than substance." Process is a major aspect of the TDA/NYSAP/SAP process. The process will lead to stockholder participation, to country ownership, and to a sustainable YSLME project/programme. The process will lead to concrete results, including facilitation of SAP implementation, networking, communications, regional coordination, and so on. The process is an important component of the GEF TDA/NYSAP/SAP process; without this process, actions may take place with no sustainability. The Actions evolve from the process of the TDA/NYSAP/SAP: this is the essence of the Strategic Action Programme. However, Component IV, which the STAP reviewer attributed primarily to process, in fact has more than $3 million in substance associated with the financial instruments, including funds for early implementation of some aspects of the SAP. Therefore, there is considerable attention to actions and outputs even in component IV.

C1-5. 3) "It is not clear that sufficient resources are committed to the development of laboratory and computer facilities and the training of technicians and scientists." The equipment and training budgets were developed in concert with the countries. The budget reflects what they see as their needs. Since the facilities are generally well equipped compared to some other regions, the needs for facilities and training are different in the YSLME than in other GEF Projects. However, there is sizeable budget allocated to these activities, as reflected in Component IV. These activities are related to regional coordination, regional capacity building, stakeholder involvement, and the like.

C1-6. 4) "If the project is to be transferable among other regions, then it is necessary to devote resources to global interchange of information." This project will network with the IWLearn project, which is intended to share global experiences. It also will network with the Global International Waters Assessment (GIWA) to share learned experiences. Such collaboration and exchange are required if the GEF is to obtain full benefit of this project.

C1-7. 5) Allocation of resources: "Nearly 40 % of project costs are allocated to the project component development of regional institutions and capacities." This portion of the project costs will address issues related to 3) above, reflecting the importance being placed on developing regional capacities. Component IV is much more than just development of regional institutions and capacities: the financial instrument sub-component of $3 million is allocated for development of priority investment portfolio, and includes funds to fund early portions of SAP implementation, a major goal of the GEF intervention.

C1-8. 6) D1. Scientific and Technical Soundness: Component IV: "it appears the weight of this component and the program as a whole are oriented to communication and coordination. I am not sure this is the best use of funding." Component IV relates to many aspects of the YSLME project. It includes the overall YSLME Coordination including the Project Coordination Unit, international staff, and the like. It also includes the Regional Capacity building. It includes the involvement of a broad spectrum of stakeholders. Finally, and perhaps most importantly, this component includes the Financial Instruments including priority investment portfolio, which includes funds to implement concrete portions of the Strategic Action Programme. This financial instrument section is approximately $3 million, and represents the heart of this phase of the GEF intervention. Finally, this component includes the Data and Information Management activities, which the STAP review alludes to as being of prime importance. Therefore, Component IV includes many sub-components which weight it heavily financially, but which are essential items to making this GEF intervention both successful and sustainable.

C1-9. 7) Component I: "investigating carrying capacity needs to be defined in the context of inter-annual and inter-decadal variability." The Project Brief acknowledges this need, and has set the time scale for investigation at the inter-decadal scale rather than the annual scale. Multi-year reviews and reanalysis of carrying capacity are proposed in light of these requirements.

C1-10. 8) Component II: "will be difficult to execute in a cost-effective way since biodiversity means many things to many people." The Project Brief focuses on biodiversity conservation in a practical manner, and doesn't suggest a pure academic approach. Huge losses of habitat have occurred in the Yellow Sea. Significant reduction in biodiversity of species has occurred. Thus, the analysis of biodiversity occurs in the context of a large signal from the past decades, and the interventions to address biodiversity issues therefore will be relatively clear. In some other IW GEF projects, biodiversity losses are minimal; this is not the situation in the Yellow Sea. This YSLME intervention should lead to concrete opportunities for conserving global biodiversity, and present investment opportunities on a national, GEF, and development bank perspective.

C1-11. 9) Data archiving: "The subject of data archival and management is a major cost and does not receive enough attention." The Project Brief separates out costs for data archiving and management. It is the subject of Sub-component IV.E, data and information management. The GEF intervention is nearly $400, 000. The Government co-finance is about $80,000. In addition to these costs, the data archiving and management costs are provided in each sub-component for I, II, and III. Given GEF experience in other regions, the necessity for data archiving and management is clear. The present project builds on these lessons learned. Examination of Sub-component IV.E and its related activities will demonstrate a logical, progressive approach to effective regional data and information sharing and management. This money will not be used to build new institutions, but rather to link existing institutions and data sources to facilitate effective sharing.

C1-12. 10) Schedule: "time phasing of project components – this needs to be spelled out in somewhat more detail and specific resources need to be identified to ensure timely delivery if the concern about lags is to be minimized." In GEF IW projects such as the Caspian Sea, the schedules and specific allocation of resources takes place once the project starts. The Project Brief budget and schedules are based on a detailed spreadsheet, some 40 pages long, of expected project schedule and cost allocation. However, the detailed work plans for each sub-component will be developed with full regional input once the implementation of the GEF Project starts. These detailed work plans will clarify the scheduling and cost implications, refining the present estimates; it will be the job of the PCU to assure the coordination and harmonization of the various work elements.

ANNEX A INCREMENTAL COST ANALYSIS

Broad Development Goal

A1. Three countries share the natural heritage of the Yellow Sea, the Democratic People's Republic of Korea, People's Republic of China, and Republic of Korea. Despite their political and social diversity, the people of the region share a common concern for the Yellow Sea. Today the Yellow Sea faces serious environmental problems, many of a transboundary nature, that arise from anthropogenic causes. The countries of the region are confronting difficult economic and administrative adjustments that complicate environmental management and natural resource protection efforts. The three littoral countries share common problems with pollution abatement and control from municipal and industrial sites in the Yellow Sea basin, as well as contributing non-point source contaminants from agricultural sources. All of the them are urgently seeking to address problems of reduced fish catches, caused in part by overfishing, harmful algal blooms, and degradation of coastal habitats, caused by intensive coastal development and effects of climate variability on the Yellow Sea Large Marine Ecosystem. The major perceived problems of the Yellow Sea LME can be summarized as follow:

- Decline of commercial fisheries;
- Degradation of biodiversity, loss of coastal habitats, loss or imminent loss of endangered species and their genomes;
- Water quality deterioration;
- Unsustainable mariculture;
- Poor or unsatisfactory human health quality, unsanitary conditions in many beaches and bathing waters, contaminated fish and sea products;
- Harmful algal blooms (emerging disease); and
- Inadequate capacity to assess ecosystem.

A2. The broad development environmental goal of this project is to ensure 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.

Baseline

A3. 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 habitat loss resulting from extensive economic development in the coastal zone, as well as by the unsustainable exploitation of natural resources. Additionally, there is significant international shipping traffic through the waters of the Yellow Sea. Constraints in legislation and setting of environmental standards, inadequate scientific data exchange and lack of public awareness and participation in planning process hinder efforts at both the national and regional levels. Each participating country is implementing its own environmental protection programmes. However, the single-country approach is not sufficient to achieve global environmental benefits in the region.

A4. The Yellow Sea riparian countries have to decide how to adjust national initiatives to be compatible with emerging international legal and technical obligations, or, conversely, the extent to which each state wishes to ignore or deviate from international practice.

A5. There is also a lack of a formal infrastructure to bring about international collaboration and cooperation in monitoring and research activities that would delineate the spatial distribution of a contaminant and its subsequent effects in the Yellow Sea and whether it would cross geopolitical boundaries. The lack of a formal structure prevents the development of well-coordinated, cooperative baseline studies and coordination in emergencies (such as a spill of oil or of other toxic and hazardous materials). Monitoring and research programs are not as effective as they should be because they stop at some governmental border, rather than at ecosystem or natural boundaries. Effective studies of transboundary contamination require excellent coordination, cooperation, and synchronization of sampling to enable effective analysis, integration, and interpretation of data across a region.

A6. During the last several years the countries have demonstrated a willingness to co-operate in matters relating to the environment of the Yellow Sea both through bilateral programmes; through active participation in regional programmes including NOWPAP, Tumen River Area Development Programme (TRADP: including the GEF SAP/TDA for the Tumer River Area), the GEF Ballast Water Project (with a pilot site in Dalian), and GEF/UNDP/IMO East Asian Seas Project (having two demonstration sites in the YSLME: one at Nampo, DPRK, and the second in the Bohai Sea).

A7. A substantial proportion of the assured co-financing by governments is derived from the existing staff and recurrent budgets of the involved ministries and government departments. It is anticipated that project activities will strengthen the influence of these ministries at a national level and hence encourage substantial increases in the recurrent budgets of the departments concerned in the future. The countries already contribute financially to regionally coordinated actions and such contributions are anticipated to increase as a consequence of this project.

A8. Each of the two participating countries has developed a legal and institutional framework for nature conservation and control of environmental degradation and pollution. Both countries are signatories of international conventions to protect biodiversity, international waters and wetlands, among others. These international commitments are reflected in national policies and legal arrangements. Through active participation in the formulation process for this project, the participating governments have demonstrated their strong commitment to taking part in the SAP preparation process and to implementing joint strategies and activities to protect common ecosystems and resources.

Global Environmental Objectives

A9. This project is a result of the participating countries' commitment to address the threats to prevent damage to the YSLME's transboundary environmental resources. The global environmental objective being pursued is to improve sectoral policies and activities that are responsible for the most serious root causes of priority transboundary environmental concerns of the Yellow Sea LME.

A10. The establishment of an LME-wide resource management regime will contribute to environmentally sustainable economic development in and around the YSLME. An ad hoc system of national level measures to manage fisheries or marine pollution will be unsuccessful when applied to a continuous natural system such as the YSLME unless a regional coordination mechanism exists. This project will establish that mechanism.

A11. The rich biodiversity of fish and other marine species in the Yellow Sea represents a major contribution to the overall biodiversity of the western Pacific Ocean and consequently to global

biodiversity. In order to avoid further losses of biodiversity in the Yellow Sea, the health of this degraded ecosystem must be improved, and fisheries recovery plans agreed upon and implemented.

A12. By providing a framework for the reduction and elimination of both land and sea-based sources of contamination, the project will contribute to reductions in the levels and impacts of pollution in the global environment.

A13. This project will create the necessary conditions and framework for concerted actions to protect globally important environmental resources. The present project is consistent with the GEF Operational Strategy of April 1996, specifically with the GEF's strategic emphasis on International Waters and Biodiversity, as well as April 1997 GEF Operational Programme (#8) for waterbody-based Large Marine Ecosystems. The project will incorporate the priorities delineated in the relevant environmental agreements to which any or all of the participating countries are involved.

GEF Project Activities

A14. Under the alternative GEF scenario, the development processes and forces are re-shaped in order to safeguard the globally important environment. This would be accomplished by GEF provision of catalytic support for incremental costs associated with the formulation of the Transboundary Diagnostic Analysis (TDA), National Yellow Sea Action Plans (NYSAPs), and a Strategic Action Programme (SAP) for the Yellow Sea. The SAP will consist of a set of legal, policy and institutional reforms and investments, to address the priority transboundary concerns identified in the TDA/SAP process.

A15. In particular, the project will provide technical assistance to strengthen both national and regional capacities for the preparation of the TDA and SAP and even more importantly to implement the SAP. The SAP will ensure the cost-effectiveness of joint efforts made by the participating countries. In addition, cooperative programmes in data sharing and legislative reforms will be conducted to enhance regional collaboration to implement the SAP.

A16. The incremental cost of the alternative activities of this project will ensure that all plans and investments will be designed with global environmental considerations in mind.

A17. The GEF alternative would support a regionally led initiative to promote the management and conservation of the coastal and marine resources of the Yellow Sea LME. It would greatly facilitate the abilities of co-operating countries to address transboundary environmental issues and common natural resources management concerns at the regional level. The GEF alternative would allow for the realization of a dynamic action oriented work programme for the preparation and implementation of the SAP, to be undertaken on an accelerated basis with support from a variety of sources. These goals would be realized through support for the following specific immediate project objectives:

1. **Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture**
   This component will summarize knowledge of the status of fisheries stocks, including legislation and regulatory mechanisms; create common regional methodologies and database for fisheries, including pilot projects; develop regional agreements, national laws and regulations, and fisheries management plans; develop and demonstrate sustainable mechanism for effective fisheries management.

2. **Propose and Implement Effective Regional Initiatives for Biodiversity Protection**
   This component will summarize status of biodiversity in the YSLME, and laws and regulation addressing biodiversity; develop regional strategy for Protection of Biodiversity in the YSLME; prepare and implement regional Biodiversity Plan and investment strategy.

3. **Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality & Protect Human Health**
   This component is designed to collect data through special investigations to fill in the gaps for the regional assessment and to set priorities for transboundary environmental issues in the region during the TDA process; identify corrective measures and long term strategies including investment strategies for remediation; establish a contaminant and ecological monitoring system for the long-term success of SAP and NAP implementation.

4. **Develop and Pilot Regional Institutional and Capacity Building Initiatives**
   This component will create a functioning network of institutions and individuals to address the YSLME environmental issues and root causes; will identify the process for evolving institutional arrangements from the support of the GEF to ownership by Region; and develop strategies to sustain the effective network of institutions and individuals to address the YSLME environmental issues and root causes.

A18. This project has leveraged approximately **US$ 8,914,065** from governments to finance the identification of GEF/SAP focal points, provide logistical support and personnel, set-up institutional arrangements, sourcing of information, and support for consultations, meetings and missions. The participating states have provided estimates of their co-financing to the project as follows:

China	US$	6,891,565
ROK	US$	2,022,500
Total	**US$**	**8,914,065**

A19. In addition to this baseline and co-financing, ongoing activities by UNDP in the region will contribute to the YSLME programme. In particular, UNDP funding for a "Marine Environmental Survey of the Yalu River" (at $650,000), plus UNDP co-financing for the GEF EAS project including an ICM demonstration site in DPRK, brings a total UNDP co-financing of $1.388 million. Objectives 1,3,6,7, and 10 of the EAS project will contribute directly to the goals of the YSLME project.

System Boundary

The area of intervention is defined as follows:

A20. The countries noted that the Bohai Sea, from a scientific point of view, may be considered as a part of the YSLME. However, since numerous ongoing complementary activities are now taking place in the Bohai Sea (such as the East Asia Seas GEF Project demonstration site, the GEF Ballast Water demonstration site at Dalian, and a large ADB project on Coastal Zone Management for the Bohai Sea), the Bohai Sea is not included in the geographic scope of the YSLME GEF Project. The Meeting agreed that the PRC will make available to the YSLME ecological and environmental data from the adjacent Bohai Sea, including in particular data from EAS and ADB projects, that may help understand the interactions between the Bohai Sea and the YSLME.

A21. For the purposes of this GEF project, the Yellow Sea LME intervention is defined by:

- to the south, the line connecting the north bank of the mouth of the Chang Jiang (Yangtze River) to the south side of Cheju ;
- to the east, the line connecting Cheju Island to Jindo Island along the coast of the ROK; and
- to the north, the line connecting Dalian to Penglai (on the Shandong Peninsula).

A22. The coastal/upland boundary within the drainage basins is defined at the mouths of the major rivers (as conduits of contaminant input to the YSLME), whereas coastal zones are defined according to existing national programs.

Annex A. Incremental Cost Matrix

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**A.** Stock assessment	Baseline	16,130,873	Stock assessment information is lacking, limited, or outdated in most countries. Irregular trawl and acoustic surveys exist in national waters.	Lack of reliable statistics on the regional stocks of major commercial fishes. Assessment of transboundary stocks is practically non-existent. Threatened and endangered migratory species are protected on a very small scale.
		Alternative	18,839,445	Increased baseline information and strengthened national capacity for sustainable fisheries management. Regional Stock Assessment	Sustainable use of transboundary stocks, building on sound stock assessment and region-wide monitoring. Effective mechanism for regional annual stock assessment.
		Increment GOV Co-finance GEF Co-finance	 1,062,500 1,646,072		
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**B**. Carrying capacity in fisheries and mariculture	Baseline	963, 855	Limited capabilities and technologies for assessing the carrying capacity of the YSLME.	Lack of regional carrying capacities analysis.
		Alternative	1,270,497	Increased baseline information on carrying capacity. State-of-the-art-knowledge on carrying capacity analysis.	Performed re-iterative series of regional analysis of carrying capacity. Mechanism for annual regional carrying capacity determination.
		Increment GOV Co-finance GEF Co-finance	 80,000 226,642		
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**C.** Mariculture production	Baseline	58,579,267	Poorly planed and managed unsustainable mariculture in both countries. Lack of baseline data.	Lack of any regional approaches. No common methodology, regulations, or agreements. Lack of data on transboundary effects.
		Alternative	59,715,762	Increased baseline information on status and trends in mariculture. New mariculture techniques. Pilot demonstration projects in place.	Joint applied research programme for mariculture.
		Increment GOV Co-finance GEF Co-finance	 963,855 172,640		

Annex A. Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**D**. Disease in mariculture	Baseline	446, 747	Lack of baseline data. Insufficient information on the state-of-knowledge of disease in mariculture, particularly on emerging diseases.	Lack of communication about new diseases, diagnoses, and control techniques.
		Alternative	567,497	Increased baseline information of disease in mariculture, particularly on emerging diseases.	Regional early-warning system about new diseases to reduce transboundary implications.
		Increment GOV Co-finance GEF Co-finance	N/A 120,750		
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**E.** Regional Fisheries agreements and National laws	Baseline	45,833	National fisheries legislation exists in all countries, but capacity for enforcement is weak in most cases.	Bilateral and multilateral agreements are not complete. No regional fisheries agreements or convention in place.
		Alternative	121,583	National fisheries laws and regulations strengthened and enforced	Developed and endorsed bilateral or regional agreement for sustainable use of fisheries resources.
		Increment GOV Co-finance GEF Co-finance	N/A 75,750		
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	**F**. Fisheries Management plan	Baseline	N/A	Lack of sustainable mechanism for effective fisheries management	Lack of regional fisheries management plan
		Alternative	75,000	Strengthened national capacity for effective fisheries management.	Improved fisheries management in the YSLME. Sustainable use of transboundary stocks building on management plans.
		Increment GOV Co-finance GEF Co-finance	N/A 75,000		
I. Develop Regional Strategies for Sustainable Management of Fisheries and Mariculture	Total ROK	GOV Co-finance	1,142,500		
	Total PRC	GOV Co-finance	2,722,891		
	Total Objective	GOV Co-finance	3,865,391		

Annex A Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**A.** Habitat conservation	Baseline	14,754,821	Risk assessment information on vulnerable habits and biodiversity threats is lacking, limited, or out of date in both countries. Countries have plans for protected areas, but capacity for enforcement is weak in most cases.	Urgent need for a comprehensive overview on the state of regional habitat. No regionally coordinated strategies of conservation and restoration of habitats exist.
		Alternative	15,056,233	Increased baseline information on existing national status and practices of coastal habitat use, conservation, and restoration. National biodiversity conservation programmes in accordance with NEAP's. Institutional strengthening through training.	Implemented Regional Strategy for Conservation Areas, including identification of priority locations for the creation of new protected areas. Conservation of habitats of global significance. Regional network of protected areas as a part of global scenario.
		Increment GOV Co-finance GEF Co-finance	N/A 301,412		
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**B.** Vulnerable species	Baseline	N/A	Risk assessment information on vulnerable species and threats is lacking, limited, or out of date in most countries. Most of the countries have plans for protection of endangered species, but capacity for enforcement is weak in most cases.	Lack of reliable information of vulnerable transboundary species. Lack of regionally coordinated strategies for protection of vulnerable species
		Alternative	155,600	Increased baseline information on existing status of vulnerable species and vulnerable tropic linkages. National biodiversity conservation programmes in accordance with NEAP's. Institutional strengthening through training.	Implemented regionally coordinated strategies for protection of vulnerable species. Conservation of species of global significance.
		Increment GOV Co-finance GEF Co-finance	N/A 155,600		
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**C.** Genetic diversity	Baseline	2,561,666	Lack of national situations of genetic degradation of important bio-resources.	Lack of regional consensus on the requirements for conservation of gene pool.
		Alternative	2,910,666	Increased baseline information of genetic degradation of important bio-resources.	Implemented recommendations for conservation of specific gene pool.
		Increment GOV Co-finance GEF Co-finance	N/A 349,000		

Annex A: Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**D.** Introduced species	Baseline	N/A	Lack of baseline data on the introduced exotic species and their pathways. Uncertainties on impacts and risks.	Lack of regional data on introduced exotic species. No regulations or control in place.
		Alternative	217,368	Increased baseline information on introduced exotic species and their pathways, assessment of impacts and risks. National rules for regulations and control of exotic species.	Identified actions to mitigate threats from possible introduction of exotic species to the YSLME transboundary biodiversity.
		Increment GOV Co-finance GEF Co-finance	N/A 217,368		
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**E.** Biodiversity Regulations	Baseline	N/A	Basic regulations for the biodiversity protection exist in both countries, but capacity for enforcement is weak in most cases. Lack of information on effectiveness of protected measures.	Both countries are signatory of CBD, CITES, Bonn, and Ramsar conventions. Lack of regional agreements or convention on the biodiversity protection of the YSLME.
		Alternative	121,140	Reviewed national regulations and effectiveness of protected measures. Strengthen existing laws and regulations. Adoption of new laws.	Regionally coordinated strategies for biodiversity protection developed and implemented. Regional agreements in place.
		Increment GOV Co-finance GEF Co-finance	N/A 121,140		
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**F.** Regional Biodiversity assessment and regional Biodiversity Action Plan	Baseline	602,410	Biodiversity action plans exist in both countries. Lack of national YSLME biodiversity protection priorities.	No regional approaches developed.
		Alternative	708,170	Clarified national YSLME biodiversity protection priorities. Improve, through training, national institutions for implementation of national YSLME action plans.	Regional Biodiversity Action Plan, including investment strategy, implemented.
		Increment GOV Co-finance GEF Co-finance	N/A 105,760		

Annex A Incremental Cost Matrix (continued)

Component	Sub-component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	**Total ROK**	GOV Co-finance	0		
	Total PRC	GOV Co-finance	1,759,036		
	Total Objective	GOV Co-finance	1,759,036		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**A.** Stressors to Ecosystem	Baseline	21,751,544	Uncertainties regarding the status and pathways of natural and human-induced stressors to the ecosystem. Lack or weakness of legal measures to reduce the stress to the ecosystem	Lack of regionally agreed approaches and methodologies to assess and rank stressors to the YSLME. Lack of regional legal measures to reduce the stress to the ecosystem.
		Alternative	21,913,684	Natural and human-induced stresses on the ecosystem identified and ranked. Identified data and information gaps.	Corrective measures to minimize the human-induced stress identified and implemented. Regional policies and legal measures identified and implemented.
		Increment GOV Co-finance GEF Co-finance	N/A 162,140		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**B.** Carrying Capacity of Ecosystem	Baseline	N/A	State of the Environment Reports, including national coastal and marine areas. Lack of transboundary approach to the YSLME environmental problems. Insufficient information on new and innovative technologies to assess the ecosystem.	Lack of regional understanding to coordinate joint actions to reduce or prevent transboundary impacts.
		Alternative	908,760	Assessment of carrying capacities of the ecosystem. Identification of root causes of environmental degradation on the YSLME and possible mitigation actions.	Establishment of regional scientific and technical framework for monitoring the changing status of YSLME and its transboundary impacts.
		Increment GOV Co-finance GEF Co-finance	480,000 428,760		

Annex A Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**C.** Contaminant Inputs	Baseline	36,667	Existing national capacities for effective marine contaminant reduction and mitigation are usually weak and poorly focused. No common standards or guidelines developed.	Lack of regional capacities for effective marine contaminant reduction and mitigation; poor regional interaction.
		Alternative	198,079	Strengthen national capacities for effective marine contaminant reduction and mitigation.	Regional system of effective marine contaminant reduction and mitigation. Regional quality and assurance system established.
		Increment GOV Co-finance GEF Co-finance	N/A 161,412		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**D.** Contaminant Levels	Baseline	11,879,478	Existing national monitoring capabilities are usually weak and poorly focused. No common standards or guidelines developed. Increased baseline information on contaminants and nutrient levels.	Lack of regional monitoring networks and poor regional interaction. Absence of regional legal agreement to mitigate contamination
		Alternative	12,299,798	Fully operational, upgraded, and strengthened national monitoring system in each country. Highly qualified trained staff. Ratification and implementation of international conventions by each country.	Network of monitoring centres throughout the region. Reliable data to catalyze reduction of existing and prevention of new types of contamination.
		Increment GOV Co-finance GEF Co-finance	320,000 100,320		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**E.** Harmful Algal Blooms and Emerging Disease	Baseline	11,224,759	Lack of baseline data on HAB's and emerging disease and their impact on bio-resources and human health.	Lack of regional monitoring capabilities to assess HABs and emerging diseases in YSLME. No management and mitigation strategies.
		Alternative	11,383,399	Increased baseline information on HAB's and emerging diseases. Comparative analysis of cause patterns and impacts on bio-resources and human health. Strengthened institutions through training.	Established a well-functioning monitoring network for HAB's and emerging diseases. Regional management and mitigation strategies developed and implemented.
		Increment GOV Co-finance GEF Co-finance	N/A 158,640		

Annex A Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**F.** Hot Spots Analysis	Baseline	7,794,608	Lack of common methodologies to identify and rank hot spot sources and non-point sources of water quality degradation. Insufficient funding and knowledge base. Lack of sufficient baseline data.	Lack of regionally adopted procedures for remediation and prevention. Insufficient funding base.
		Alternative	8,093,888	Strengthen national capabilities to determine and rank hot spot sources of water quality degradation.	Regional procedures for remediation and prevention adopted. Financial resources secured.
		Increment GOV Co-finance GEF Co-finance	N/A 299,280		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**G.** Emergency Planning And Preparedness	Baseline	155,000	National network for emergency response exist, and contingency plans are developed but the implementation is poor. Insufficient funding base.	Regional coordination for emergency response remains underdeveloped.
		Alternative	306,320	National marine pollution preparedness, response, and contingency plans enforced.	Major reduction in risks of regional environmental degradation. YSLME Regional contingency plan. Strong regional network of responsible authorities.
		Increment GOV Co-finance GEF Co-finance	N/A 151,320		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**H.** Legal and Regulatory	Baseline	33,333	All countries in the Region have some form of legal framework for the protection of their own coastal and marine environments, but enforcement is poor.	No regional coordinating mechanisms exist, perhaps in the absence of regional legal documents. Both countries have ratified several international convention and agreements.
		Alternative	113,093	Legal framework for addressing transboundary problems established. Institutions strengthened through training in environmental planning and management.	Existing national and international laws and conventions surveyed. Coordinated proposals drafted for improved water quality legislation and regulation.
		Increment GOV Co-finance GEF Co-finance	N/A 79,760		

Annex 1: Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health	**I**. Fate And Transport Analysis To Facilitate SAP Analysis	Baseline	1,440,612	Poor understanding of fate and transport of contaminants. Limited modeling capabilities.	Lack of regional strategies to assess the fate, transport, and risks of contaminants and nutrients.
		Alternative	1,793,452	Increased baseline information of fate and transport of contaminants and nutrients. Strengthened national capabilities through training.	Performed fate and transport analyses for management and policy development, including EIA process and ICZM. Regional training activities for environmental risk assessment implemented.
		Increment GOV Co-finance GEF Co-finance	N/A 352,840		
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality, and Protect Human Health	**Total ROK**	GOV Co-finance	800,000		
	Total PRC	GOV Co-finance	1,759,036		
	Total Objective	GOV Co-finance	2,559,036		
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**A.** Stakeholders Involvement	Baseline	N/A	Stakeholders involvement in the environmental management and decision-making process is weak	Awareness programmes in the individual countries rarely cover regional issues.
		Alternative	316,500	Identified and strengthened capacities for stakeholders' involvement in the YSLME	Effective involvement of stakeholders in environmental and resource management, as well as the decision-making process, to address the YSLME environmental issues and root causes.
		Increment GOV Co-finance GEF Co-finance	N/A 316,500		

Annex A Incremental Cost Matrix (continued)

Component	Sub-component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**B.** Regional coordination	Baseline	187,500	Lack of regional coordination mechanism.	Some form of regional cooperation between each country's Ministries of Environment.
		Alternative	3,374,791	Effective co-ordination and implementation of national activities, as well as integration of these environmental activities into national policies and investment programmes. Strengthened institutional and human capacity through training and active involvement of national experts in the TDA and SAP preparation.	Effective regional coordination mechanism for the YSLME sustained through regional agreements
		Increment GOV Co-finance GEF Co-finance	 N/A 3,187,291		
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**C.** National Institutions	Baseline	963,855	Lack of ability to contribute to environmental management and decision-making.	Some form of regional cooperation between national institutions in both countries. Joint oceanographic programme. Lack of sustainable contributions to the YSLME
		Alternative	2,094,477	Strengthened national institutions, as well as enhanced ability to contribute to environmental management and decision-making.	Effective regional network of institutions to address the YSLME environmental issues and root causes.
		Increment GOV Co-finance GEF Co-finance	 650,602 480,020		
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**D.** Financial Instruments	Baseline	N/A	Insufficient financial support for the protection and rehabilitation of the YSLME.	No regional investment strategy developed.
		Alternative	3,007,840	Improved national capacities and training in environmental project identification and preparation. Small environmental grants programme developed, with priority investment projects developed for each country.	Implemented pre-feasibility studies of promising technologies and industries to help achieve the goals of the YSLME, to create an investment portfolio (Priority Investment Portfolio). Long term environmental investment to implement the SAP and NYSAP's established
		Increment GOV Co-finance GEF Co-finance	 N/A 3,007,840		

Annex A Incremental Cost Matrix (continued)

Objective	Component	Cost Category	Cost	Domestic Benefits	Global Environmental Benefits
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**E.** Data and Information Management	Baseline	734,362	Countries in the region have national environmental data centres, and some have GIS. Data for the YSLME are stored in different institutions. No information or decision support system available.	Data and information exchange between countries is weak. No regional data centres. No regional quality assurance.
		Alternative	1,197,892	Strengthening or creation of national environmental data centres and institutions through provision of equipment, training, and networking. Easy and reliable access to electronic means of communication, data, and information exchange. Stakeholders trained and willing to use GIS and Information systems.	Regional YSLME Networking Information System including data on Institutional capacities, scientists, environmental projects, environmental data sets in the region, and GIS, accessible via Internet to the world community. High quality, reliable data on YSLME environmental issues. Sustainable regional mechanism for DIM for effective management of the YSLME.
		Increment GOV Co-finance GEF Co-finance	 80,000 383,530		
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**F.** Public Awareness And Participation	Baseline	11,776,667	Some form of environmental public awareness and participation exists. Few active environmental NGO's addressing YSLME problems. Public participation in resource management and coastal development decisions is not sufficient.	Awareness programmes in the individual countries rarely cover regional issues.
		Alternative	12,267,827	Increased environmental awareness at the national and community levels. Local environmental NGO's and community groups obtain grants to carry out projects.	Increased public awareness and support for regional environmental issues. Enhanced overall effectiveness of environmental awareness programmes through the organization of concerted region-wide activities, as well as exchange of lessons learned through an active regional network of NGO'ss and community groups.
		Increment GOV Co-finance GEF Co-finance	 N/A 491,160		
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	**Total ROK**	GOV Co-finance	80,000		
	Total PRC	GOV Co-finance	650,602		
	Total Objective	GOV Co-finance	730,602		

Annex A: Summary Incremental Cost Matrix

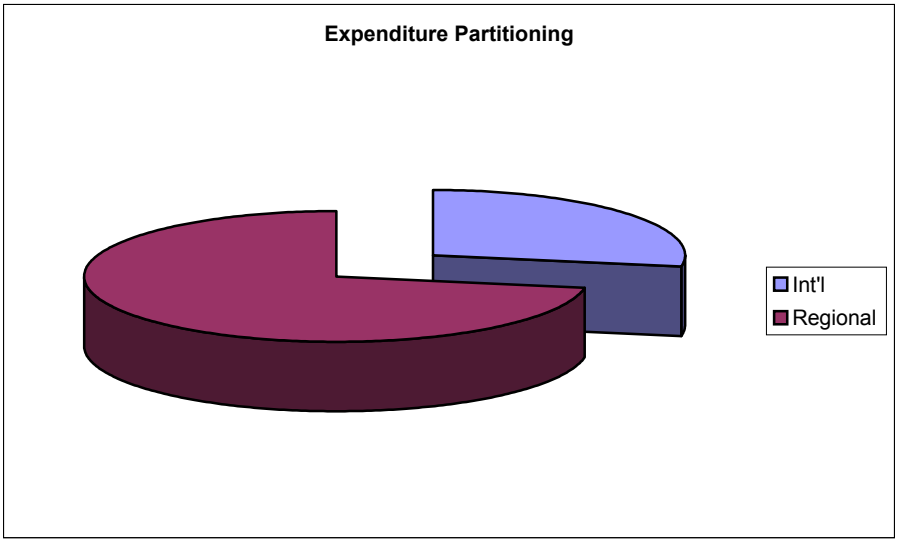
Objective	Component	Baseline (B)	Alternative (A)	Increment (A-B)	
				Governments	GEF
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	A. Stock Assessment	16,130,873	18,839,445	1,062,500	1,646,072
	B. Carrying Capacity in Fisheries and Mariculture	963,855	1,270,497	80,000	226,642
	C. Mariculture Production	58,579,267	59,715,762	963,855	172,640
	D. Disease in Mariculture	446,747	567,497	N/A	120,750
	E. Regional Fisheries Agreements and National Laws	45,833	121,583	N/A	75,750
	F. Fisheries Management Plan	N/A	75,000	N/A	75,000
	Total ROK	59,764,166		1,142,500	
	Total PRC	16,402,409		2,722,891	
	Total Objective	76,166,575	82,348,820	3,865,391	2,316,854
II. Propose and Implement Effective Regional Initiatives for Biodiversity Protection	A. Habitat Conservation	14,754,821	15,056,233	N/A	301,412
	B. Vulnerable Species	N/A	155,600	N/A	155,600
	C. Genetic Diversity	2,561,666	2,910,666	N/A	349,000
	D. Introduced Species	N/A	217,368	N/A	217,368
	E. Biodiversity Regulations	N/A	121,410	N/A	121,140
	F. Regional Biodiversity Assessment & Regional Biodiversity Action Plan	602,410	708,170	N/A	105,760
	Total ROK	16,111,668		0	
	Total PRC	1,807,229		1,759,036	
	Total Objective	17,918,897	20,928,213	1,759,036	1,250,280
III. Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality, and Protect Human Health	A. Stressors to Ecosystem	21,751,544	21,913,684	N/A	162,140
	B. Carrying Capacity of Ecosystem	N/A	908,760	480,000	428,760
	C. Contaminant Inputs	36,667	198,079	N/A	161,412
	D. Contaminant Levels	11,879,478	12,299,798	320,000	100,320
	E. Harmful Algal Blooms and Emerging Disease	11,224,759	11,383,399	N/A	158,640
	F. Hot Spots Analysis	7,794,608	8,093,888	N/A	299,280
	G. Emergency Planning and Preparedness	155,000	306,320	N/A	151,320
	H. Legal and Regulatory	33,333	113,093	N/A	79,760
	I Fate and Transport Analysis to Facilitate SAP Analysis	1,440,612	1,793,452	N/A	352,840
	Total ROK	13,809,977		800,000	
	Total PRC	40,506,024		1,759,036	
	Total Both Objective	54,316,001	58,769,509	2,559,036	1,894,472

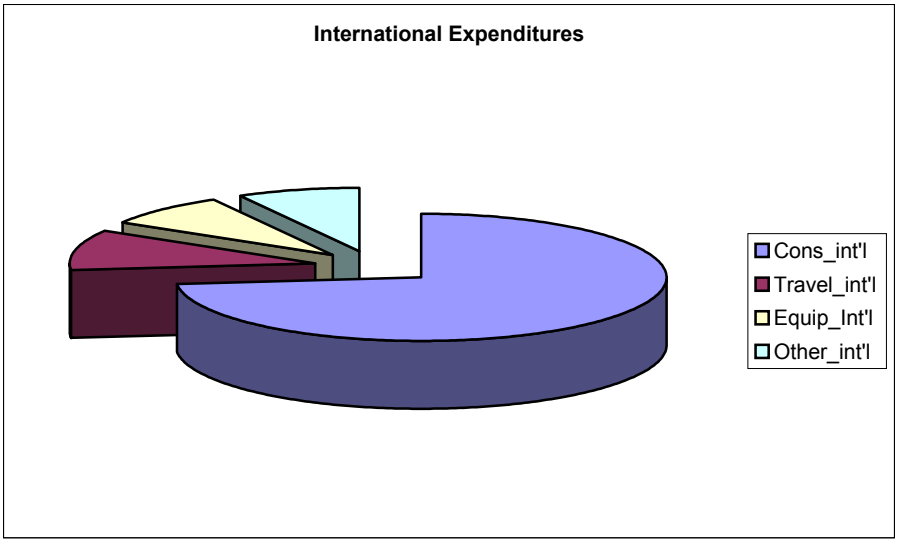
Annex A **Summary Incremental Cost Matrix (continued)**

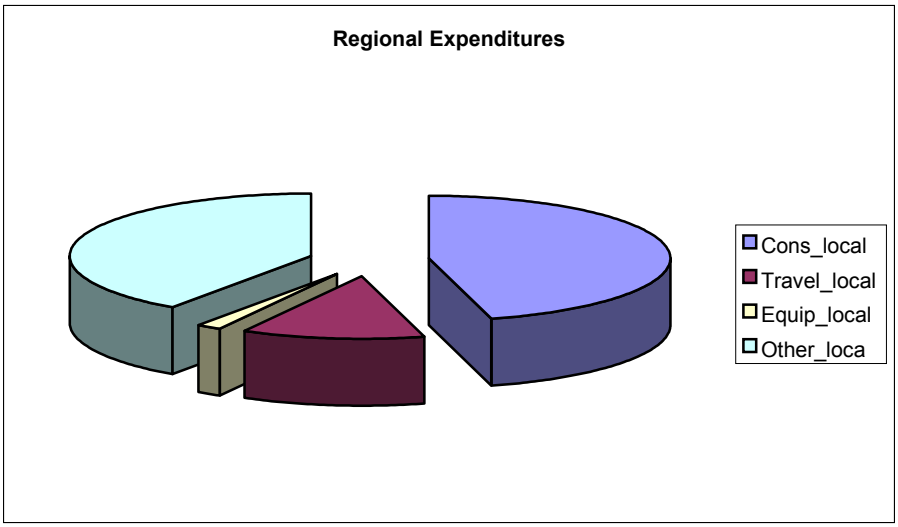
Objective	Component	**Baseline (B)**	**Alternative (A)**	**Increment (A-B)**	
				Governments	**GEF**
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	A. Stakeholders Involvement	N/A	316,500	N/A	316,500
	B. Regional Coordination	187,500	3,374,791	N/A	3,187,291
	C. National Institutions	963,855	2,094,477	650,602	480,020
	D. Financial Instruments	N/A	3,007,840	N/A	3,007,840
	E. Data and Information Management	734,362	1,197,892	80,000	383,530
	F. Public Awareness and Participation	11,776,667	12,267,827	N/A	491,160
	Total ROK	12,180,457		80,000	
	Total PRC	1,481,927		650,602	
	Total Both Objective	13,662,384	22,259,327	730,602	7,866,341
	Total	162,063,857	184,305,869	8,914,065	13,327,947

PDF-B: 349,650 US$
Project Support Costs: 1,066,236 US$
Total Project Costs: 14,743,833 US$

Figure A-1: Allotment of GEF Incremental Financing for YSLME Project







ANNEX B LOGFRAME MATRIX

Component	Intervention Logic	Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
	Long-term development / environment Objectives: environmentally-sustainable management and use of the YSLME 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	0.1 Defined regional ecosystem; management framework implemented by year; 0.2 Improvements in catch-per-unit effort by year 5; 0.3 Improved water quality for target contaminants by year 5; 0.4 Reversal in trend of proliferation of HABs by year 5; 0.5 Loss of Biodiversity slows by year 5; 0.6 Final TDA prepared and agreed, end of year 2; 0.7 Strategic Action Programme (SAP) formulated and endorsed at ministerial level in each country, end of year 4; 0.8 Yellow Sea Large Marine Ecosystem National Action Plans (YSNAPs) for each country formulated and endorsed by end of year 3; 0.9 Agreed set of indicators (process, stress reduction, environmental status) to monitor progress of SAP implementation by end of year 4.	Steering Committees (SC) annual reports; PCU documents; PCU and technical reports; Working groups reports; Interministerial Coordinating Committee reports; For Biodiversity, pentadal census.	Assume continued national commitment to the regional program at each sector level, including offer of national resources. The ability of the SC and PCU to formulate and implement community-based solutions relies on the support of national agencies through coordinated (but independent) actions. The GEF project will create a model that can be adopted in the future as a permanent activity of the individual national sectors. Broad Stakeholder Participation.
	Project purpose: Formulation of a Transboundary Diagnostic Analysis (TDA) , National Yellow Sea Action Plans and a Strategic Action Programme (SAP). Facilitation of the initial steps of the implementing SAP to manage shared marine resources and achieve sustainable development for the Yellow Sea Large Marine Ecosystem. Develop a mechanism to objectively measure effects of management actions		TDA published and broadly disseminated; Countries endorse SAP; National and donor commitments to financing SAP and YSNAP implementation; PCU and technical reports.	Remedial actions can be costly and/or unpopular in some sectors. A well-designed monitoring program will provide objective technical information with which to assess the success (or failure) of specific management actions and can be used to adjust future actions.

ANNEX B. LOGFRAME MATRIX (continued)

Objective I. FISHERIES/MARICULTURE		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
OUTPUTS	**TDA** • 1.1 Summary of existing state of knowledge • 1.1 Identification of legislative gaps **SAP** • 1.2 Draft fisheries management plans • 1.2 Draft regional agreement for fisheries management • 1.2 Drafts of strengthened national fisheries laws • 1.2 Fisheries database • 1.3 Pilot projects **SAP IMPLEMENTATION** • 1.2 Regional agreement	Delivery of report by end of yr2 Draft disseminated to regional stakeholders and governments by end of yr3 Database outputs used by NCUs by end of yr3 Endorsed by governments by end of yr4	Project files Working group reports. Working group reports. NCU records Interministerial Coordinating Committee reports	
ACTIVITIES	A. Stock Assessment • 1.1 Review existing data and diagnose condition of stocks • 1.1 Perform demonstration of regional survey • 1.2 Develop common methodology for joint regional stock assessment • 1.2 Perform initial joint regional stock assessment • 1.2 Create mechanism for regional annual stock assessment	Fisheries stocks status reports. Equipment purchased by yr1 Survey results written up by end of yr2 Methodology for joint regional stock adopted by both countries by end of yr3 Assessment published by end of yr1 Assessments are undertaken annually by end of yr5	Project files Working group reports. Procurement records of PCU Project files Publication reference provided by PCU	The countries will agree to perform a joint stock assessment. The risk is low since this is one of their priority actions identified during the PDF-B phase. Relies on political will to find ongoing regional efforts.
	B. Assessing Carrying Capacity • 1.1 Review existing knowledge and identify gaps • 1.1 Complete knowledge gaps • 1.1 Perform iterative series of analysis • 1.2 Undertake annual carrying capacity determination	Report published and widely distributed. Analysis results available to PCU by end of yr3 Carrying capacity estimates published annually after yr3	Publication reference provided by PCU Working group reports. Project files Government or regional body publication records Interministerial Coordinating Committee reports	Carrying Capacity gaps defined and process developed to fill in knowledge gaps. Regional agreements on methodology to assess carrying capacity. Relies on political will to find ongoing regional efforts.
	C. Mariculture Production • 1.1Review existing status and trends • 1.2 Develop joint research program • 1.3 Undertake pilot demonstrations • 1.3 Assist region to implement mariculture techniques	Scientific reports published. Progress reports completed annually. First reports of joint research programme published by end of yr5.	Project files Working group reports. Interministerial Coordinating Committee reports	Existing status and trends reviewed regularly. Full stakeholder participation to ensure acceptability of new mariculture techniques.

ANNEX B. LOGFRAME MATRIX (continued)

Objective I. FISHERIES/MARICULTURE		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACTIVITIES (CONT')	D. Disease in Mariculture • 1.1 Review existing knowledge • 1.1 + 1.3 Develop and demonstrate new technology for diagnosis, prevention and control • 1.2 Facilitate communication	Progress reports completed annually. Countries agree to use new technology by end of yr3. Early-warning system operative by end of yr5	Project files. Working group reports. Interministerial Coordinating Committee reports	Joint development and demonstration of new technology between countries, which results in increased communication regarding emerging diseases, diagnosis, and control. Full Stakeholder participation.
	E. Regional Agreements and National Laws • 1.1 Review existing national laws and international agreements • 1.2 Develop regional agreement for sustainable use of fisheries resources • 1.2 Propose measures for strengthening laws	Status report published. Regional agreement endorsed by end of yr3 New laws enacted nationally by end of yr5.	Project files. Interministerial Coordinating Committee reports. Parliament records and NCU files.	Commitment of countries to development and endorsement of regional agreements, as well as the strengthening of existing regulations.
	F. Management Plan • 1.2 Develop regional fisheries management plans • 1.3 Implement plans	Status report published by end of yr2. Country endorsement and implementation of management plan by end of yr5	Project files. Interministerial Coordinating Committee reports.	Maintenance of sustainable fish populations will require the reduction of system stresses, including chemical contamination and fishing pressure. Such remedial actions directly affect individuals or organizations now doing business in the region and early identification/ education of stakeholders will be necessary for compliance with these actions. Some mechanism to compensate the affected stakeholders must be found to gain their cooperation.

ANNEX B. LOGFRAME MATRIX (continued)

OBJECITVE: II. BIODIVERSITY PROTECTION		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
OUTPUTS	**TDA** • 2.1 Regional biodiversity assessment. • 2.1 List of existing legal and regulatory frameworks for biodiversity in the YSLME. **SAP** • 2.2 Regional Biodiversity Action Plan, including Regional Strategy for Conservation Areas, regional strategies for protection of vulnerable species, and regional consensus on the conservation of gene pool. • 2.2 Investment strategy. • 2.2 Proposals for regulation and control of exotic species. **SAP IMPLEMENTATION** • 2.2 New laws for regulation and control of exotic species identified. • 2.3 Funded biodiversity projects responding to the priority actions of the Regional Biodiversity Action Plan.	Delivery of assessment by end of yr2. List prepared by end of yr1. Action Plan and investment strategy endorsed by government by end of yr3. New laws passed by relevant government mechanisms by end of yr4 Signed project documents, or evidence of financial commitment from govts, for Regional Strategy actions by end of yr5	Project files Working group reports. Interministerial Coordinating Committee reports Parliament records Copies of project documents or govt. commitment on project files.	
ACTIVITIES	A. Habitat Conservation • 2.1 Review existing practices • 2.2 Develop regionally coordinated strategies • 2.3 Implement Regional Strategy for Conservation Areas	Regional Strategy for Conservation Areas adopted by end of yr3. 5 new protected areas identified by end of yr2. Signed project documents, or evidence of financial commitment from govts, for Regional Strategy actions by end of yr5	Copy of signed strategy on project files. Acknowledgement of new protected areas by relevant Ministries. Interministerial Coordinating Committee reports. Copies of project documents or govt. commitment on project files.	Countries adopt regional strategy, and financial mechanisms are identified.
	B. Vulnerable Species. • 2.1 Conduct national review of status • 2.2 Develop regionally coordinated strategies • 2.3 Implementation of regionally coordinated strategies	National review completed by end of yr2. Strategies for protection of vulnerable species adopted by SC and endorsed by relevant Ministries by end of yr3 Signed project documents, or evidence of financial commitment from govts, for regional strategies by end of yr5.	Project files. SC minutes. Interministerial Coordinating Committee reports. Copies of project documents or govt. commitment on project files.	Regional agreement is reached in line with national priorities. The risk in minimized since both countries have ratified several international conventions for protection of vulnerable species.
	C. Genetic Diversity. • 2.1 Determine degradation of important bio-resources • 2.2 Develop regional consensus on conservation requirement • 2.3 Prepare recommendations for conservation measures	National determinations done by end of yr2. Agreement between countries signed by end of yr3. Recommendations endorsed by countries by end of yr5.	Project files. Working group reports. Copy of signed agreement on project files. Endorsement on project files.	Protection of natural gene pools (including non-commercial species which support economically valuable resources) by a variety of mechanisms will be needed to address this issue.

ANNEX B. LOGFRAME MATRIX (continued)

OBJECTIVE: II. BIODIVERSITY PROTECTION		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACTIVITIES (CON'T)	D. Introduced Species • 2.1 Document introduced exotic species • 2.2 Develop proposals for regulation and control. • 2.3 Implement strategy for regulation and control	Documentation completed by end of yr2 Ballast water treatment and prevention agreement ratified and distributed by end of yr4. Signed project documents, or evidence of financial commitment from govts, for implementation of regulatory strategy by end of yr5.	Project files. Ratification of agreement gazetted by protocol/convention secretariat. Copies of project documents or govt. commitment on project files. Interministerial Coordinating Committee reports	Proposals for regulation and control of exotic species agreed upon by countries (and/or countries adopt and ratify anticipated new IMO ballast water protocol or convention)
	E. Regulations. • 2.1 Review national regulations and assess effectiveness • 2.2 Develop regionally coordinated strategies	Review completed by end of yr1. Biodiversity conservation agreement signed and ratified by end of yr3.	Project files. Copy of signed agreement on project files. Interministerial Coordinating Committee reports	Effective environmental resource protection derives from a combination of regulatory and non-regulatory actions. Before recommendations for effective regulatory changes can be made, a survey of existing national and international regulations needs to be performed.
	F. Regional Assessment and Regional Biodiversity Action Plan • 2.2 Coordinate above activities into a biodiversity assessment, Regional Biodiversity Action Plan, and investment strategy.	see indicators for OUTPUTS		Ratification of the Regional Biodiversity plan. The risk is minimized since both countries have ratified the CBD. Donors' commitments secured.

ANNEX B. LOGFRAME MATRIX (continued)

Objective III. REDUCING STRESS		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
OUTPUTS	**TDA** • 3.1 Data on identified stresses **SAP** • 3.2 Proposals for upgrading the regional monitoring network **SAP IMPLEMENTATION** • 3.2 Regional planning and preparedness strategies	Reports completed by end of yr2 Proposals submitted to potential donors by end of yr4 Funding identified by end of yr5.	Working group reports. Project files. Letters of intent/commitment from countries and donors.	
ACTIVITIES	A. Stressors to Ecosystem • 3.2 Identify and rank stresses • 3.2 Identify corrective measures • 3.2 Identify policies and legal measures • 3.2 Develop strategy for long-term sustainability of investments • 3.3 Implement corrective measures	Technical report published by end of yr2 Progress reports published annually	Working group reports.	Once data and information gaps are identified, implementation of new measures to reduce stressors will take place.
	B. Carrying Capacity of the Ecosystem • 3.1 Assess carrying capacities under changing stresses • 3.1 Identify information gaps • 3.2 Develop strategies for monitoring changes • 3.1 Prepare state-of-ecosystem reviews and reports • 3.3 Facilitate implementation of strategies	State of the environment report published by end of yr5.	Working group reports.	Regional strategies must be developed for monitoring the changing status of the ecosystem. Countries will have to facilitate implementation of new strategies for constantly improving the ecosystem. New carrying capacity methodology must be developed and agreed regionally.
	C. Contaminant Inputs • 3.1 +3.3 Assess and monitor contaminant and nutrient levels • 3.2 Develop regional priorities and strategies to reduce levels • 3.3 Facilitate implementation of strategies	[Regional quality control and assurance system establishedby end of yr2. Annual contaminant input reports published.	Working group reports Project files. Letters of intent/commitment from countries and donors.	Countries will have to agree upon regional priorities and strategies to reduce contamination to sustainable levels, including promotion activities which involves sharing new developments and technologies.
	D. Contaminant Levels • 3.1 Develop baseline data • 3.2 Develop regional monitoring network strategy • 3.2 Develop funding mechanism to implement monitoring strategy	Monitoring data reports and annual reports published. Donors and country commitments to the regional monitoring network confirmed by end of yr5.	Working group reports Project files Letters of intent/commitment from countries and donors.	A well-designed monitoring program will provide objective technical information with which to assess the success (or failure) of specific regional management actions and can be used to guide future actions. In-country and international sources of support will need to be identified and secured to assure acceptance and implementation.

ANNEX B. LOGFRAME MATRIX (continued)

Objective III. REDUCING STRESS		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACTIVITIES (CON'T)	E. Harmful Algal Blooms and Emerging Disease • 3.1 Undertake comparative analysis of causes and impacts • 3.3 Monitor HABs • 3.2 Develop management and mitigation strategies • 3.3 Facilitate regional management implementation	Monitoring data reports and annual reports published. Strategies agreed upon and implementation begun by end of yr5	Working group reports Project files Interministerial Coordinating Committee reports	Countries will have to facilitate regional management and mitigation implementation of the causes, patterns, and impacts of HABs and Emerging Disease on bio-resources and human health.
	F. Hot Spots Analysis • 3.2 Determine and rank hot spot sources of water quality degradation • 3.2 Develop procedures for remediation • 3.2 Develop investment strategies • 3.3 Facilitate implementation of procedures	Technical report published by end of yr2 Procedures agreed upon by end of yr3 SAP commitments to hot spot remediation confirmed by end of yr5.	Working group reports. Project files. Interministerial Coordinating Committee reports Letters of intent/commitment from countries and donors.	Facilitation of procedures for re-mediation and prevention of hot spots can result only through securing financial commitments.
	G. Emergency Planning and Preparedness • 3.1 Assess national emergency and contingency capabilities • 3.2 Develop strategies for rapid and long-term regional responses • 3.2 Facilitate regional actions to enable contingency planning • 3.2 Harmonize customs, training.	Technical reports published by end of yr2. Strategy agreed by governments by end of yr3 Regional actions discussed at SC meetings and workshops.	Working group reports. Project files. Interministerial Coordinating Committee reports. SC minutes and workshop reports.	Countries agree to cooperation on joint emergency preparedness and response.
	H. Legal and Regulatory • 3.1 Review and compare national regulations and laws on water quality develop proposals for coordination of regulations • 3.3 Facilitate coordinated actions to improve legislation and regulation	Technical report published by end of yr1. Regional actions discussed at SC meetings and workshops.	Working group reports. Project files. SC minutes and workshop reports.	Countries will agree to take coordinated approach , in spite of socio-economic and political differences.

ANNEX B. LOGFRAME MATRIX (continued)

Objective III. REDUCING STRESS		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACTIVITIES (CON'T)	I. Fate and Transport Analysis to Facilitate SAP Analysis			Governments and institutions must make available results from previous studies, and apply existing models.
	• 3.1 Review existing understanding of fate and transport of contaminants	Technical report published by end of yr2.	Working group reports. Project files.	
	• 3.2 Develop regional assessment strategies	Strategies accepted by SC by end of yr3.	SC minutes.	
	• 3.2 Perform fate and transport analyses for management and policy development, including EIA process and ICZM	Analyses published by end of yr4.	Working group reports.	
	• 3.3 Develop regional training activities	5 number of training activities held by end of yr5	Project files.	

ANNEX B. LOGFRAME MATRIX (continued)

Objective IV. Regional Institutions and Capacities		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
OUTPUTS	**TDA** • 4.1 Stakeholder and institutional participation strategy • 4.1 Final TDA **SAP** • 4.2 Network of local, national and regional stakeholders • 4.2 National Yellow Sea Action Plans • 4.2 Strategic Action Programme **SAP IMPLEMENTATION** • 4.3 Programme of regional and national intersectoral cooperation • 4.3 Financial mechanism to sustain public awareness	Strategy included in final TDA, which is approved by SC and UNDP by end of yr2. 500 stakeholders attend working group meetings by end of yr3. NYSAPs approved by governments by end of yr3. SAP approved by governments and UNDP by end of yr4. SAP implementation committed by countries and donors by end of yr5.	SC minutes. UNDP TPR meeting minutes. Working group reports. Interministerial Coordinating Committee reports SC minutes. UNDP TPR meeting minutes. Letters of intent/commitment from countries and donors.	
ACTIVITIES	A. Stakeholders • 4.1 Identify stakeholders and assess their capabilities for contributing to environmental management • 4.3 Strengthen stakeholder capabilities • 4.1 + 4.3 Encourage stakeholder involvement	Stakeholders identified and involved in working groups by end of yr1. 5 training workshops for stakeholders by end of yr3.	Stakeholders' participation report. Project files.	Routine and effective involvement by stakeholders in planning, management and decision-making can only be accomplished by on-going encouragement, strengthened capacities, and financial commitment by donors and countries. Barriers to broaden stakeholder participation must be removed.
	B. Regional Coordination • 4.1 Create a functioning regional coordination mechanism • 4.2 Identify modes to sustain regional coordination mechanism • 4.3 Assist in maintaining effective regional coordination	Coordination office opened and staff hired by end of yr5. 10 regional coordination meetings held by end of yr5. Funds committed for long-term sustainability of mechanism by end of yr5.	Project files. Terms of Reference (TORs) and meeting reports. Letters of intent/commitment from countries and donors.	The program (i.e., SC and PCU) must effectively communicate the issues and the suggested remedies to the national sectors and be responsive to national real and perceived needs.
	C. National Institutions • 4.1+ 4.3 Strengthen capacity to contribute to environmental management and decision-making • 4.3 Facilitate ongoing management	40 institutions participate in 10 stakeholder project meetings over the life of the project	Meeting attendee lists showing national institution participation.	Financial and motivational means must be identified to develop these national institutions into sustainable contributors of the YSLME.

ANNEX B. LOGFRAME MATRIX (continued)

Objective IV. Regional Institutions and Capacities		Objectively Verifiable Indicators	Sources of Verification	Assumptions and Risks
ACITIVITIES (CON'T)	D. Financial Institutions • 4.1 Develop regional small grants program • 4.1 + 4.2 Provide training • 4.3 Provide funding for pre-feasibility studies • 4.1 Identify a mechanism for participation of development banks	Priority Investment Portfolio prepared by end of yr5. Feasibility study on economic instruments completed by end of yr5.	Summary report on PIP published. Progress reports published. Project files.	Financial support for recommended actions needs to be integrated into YSLME recommendations from the beginning. While international and national government support is anticipated, private commercial and industrial activities must supply substantial funds to the Programme.
	E. Data and Information Management • 4.1 Determine regional data and information management capabilities • 4.1 Develop regional DIM strategy • 4.3 Implement regional DIM strategy	Regional YSLME Information System including meta-level data used by 100 stakeholders per month by end of yr5. YSLME activities and data broadly disseminated via Internet.	Progress reports published. Website administration records. Distribution records of GIS available on CD and web.	Access of data and information for all Stakeholders. Government commitments to make available and distribute data broadly.
	F. Public Awareness and Information • 4.1 Develop public awareness campaign • 4.2 Demonstrate regional public awareness campaign • 4.3 Encourage ongoing public awareness	Strong Regional NGOs network established by end of yr4. Major Stakeholders participate in TDA/NYSAP/ SAP process.	Public awareness and environmental education materials (print and on-line); Reports from annual NGO forum, NGO directory (print and on-line). List of SAP contributors.	All recommendations made by the YSLME regional program for remedial and resource protection action will require trade-offs and will negatively affect someone. To gain cooperation and compliance, the rationale for action and the real costs incurred need to be fully understood by the affected groups. YSLME needs to actively assist these groups in finding support to attenuate the negative effects of resulting changes.

ANNEX C STAP ROSTER TECHNICAL REVIEW

REVIEW OF "PREPARATION AND PRELIMINARY IMPLEMENTATION OF A STRATEGIC ACTION PROGRAMME FOR THE YELLOW SEA LARGE MARINE ECOSYSTEM"

BY B.J. ROTHSCHILD

OVERVIEW

C1. The strategic plan is on target and can provide the basis for a successful project. The optimal utilization of GEF funding requires that all participants have a similar view of goals and objectives and that they perceive that the goals and objectives are attainable. In this regard the long-term objective of the project contains various phrases that are difficult to define and harder to implement: 1) ecosystem based management, 2) environmentally sustainable, 3) reducing development stress and, 4) sustainable development. In some point in the strategic planning the exact meaning of these phrases needs to be spelled out in concrete terms particularly with regard to the YSLME. It must be realized that the components of the project are very different in regard to their potential for practical results. Activities such as stock assessment, monitoring of pollution and mariculture evaluation are relatively easy to define and to relate project outputs to project inputs. Less definable and perhaps less useful *applied* results will derive from projects oriented toward projects oriented toward genetic diversity and the carrying capacity of the ecosystem. It is not that these endeavors are unimportant, rather it is that they are essentially research issues. The practical implementation of the project and the major weight of the project are loaded toward process rather than substance. That is to say that the funding allocations appear to be more weighted toward stakeholder involvement than to mariculture production, for example. There is nothing wrong with this provided that this is the clearly recognized intent of the project. It is not clear without detailed analysis whether the very expensive substance-related projects are adequately funded. With regard to the development of regional institutional and capacity building component it is not clear that sufficient resources are committed to laboratory and computer facilities and the training of technicians and scientists. At the end of the day the sustainability of the project will be measured in terms of not only public awareness but in the scientific and technical capacities that have been developed. If the project is to avoid the pitfalls of other projects such as the Black Sea project, then it might be necessary to focus in greater detail on explicit resources and mechanisms that are devoted to the monitoring and review of project progress. If the project is to be transferable among other regions, then it is necessary to devote resources to global interchange of information.

A. GENERAL OBJECTIVES AND IDENTIFIED ISSUES

C2. The proposed project has a long-term objective***: "ecosystem-based, environmentally sustainable management and use of the yslme 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."*** The project is intended to have a five-year duration.

C3. The project narrative articulated several issues of concern implying that these relate to the long-term objectives of the project:

1. Multilateral measures for marine pollution control are particularly deficient.
2. Lack of formal infrastructure to bring about collaboration and cooperation in monitoring and research activities.

3. Implement ecosystem based management approach to reduce development stress on ecosystem and to initiate recovery actions leading to the long-term sustainability of the environment and the resources…
4. HABs are increasing and might be influence by underwater construction.
5. The Yellow Sea most intensively exploited in the world
6. Extensive aquaculture mariculture and cultivated seaweed.
7. Preventing lags such as the one that occurred in the Black Sea Programme.

B. COMPONENTS OF PROJECT APPROACH

C4. Four project components have been identified to address the objectives of the program:

1.Regional strategies for sustainable development of fisheries and aquaculture
2.Effective regional initiatives for biodiversity protection
3. Actions to reduce stress to the ecosystem improve water quality and protect human health
4. Development of regional institutional and capacity building.

C. ALLOCATION OF RESOURCES COMMITTED TO PROJECT

C5. Nearly 40 percent of the project costs are allocated to the project component *development of regional institutions and capacities*. Nearly as much has been allocated to *sustainable management*. Smaller amounts to *biodiversity protection* and *reducing stress to ecosystem*. Since these reflect the totals it is interesting to note that GEFs contribution is primarily oriented toward the development of regional institutions and capacities.

D. ADDRESSING SPECIFIC QUESTIONS

C6. D1. Scientific And Technical Soundness—The bulk of the project funds are devoted to Component IV-- building regional institutions and capacities. So the issue with regard to this particular allocation is whether it will be devoted specifically to capacity building, that is education, training, and facilities that focus on the major problems of the ylse. While some aspects of education, training, and facilities are listed in Component IV, Annex D, it appears that the weight of this component and the program as a whole are oriented to communication and coordination. I am not sure that this is the best use of the funding.

C7. Component I is generally scientifically and technically sound. However, it cannot be stressed enough that, investigating carrying capacity needs to be defined in the context of inter annual and inter decadal environ mental variability. Component II will be difficult to execute in a cost-effective way since biodiversity means many things to many people. Surely “habitat conservation” and “introduced species” will form the basis for the most relevant work. The same remark on carry capacity is appropriate in component III. It would be well to focus on contaminant input and levels as well as the specific dynamics of HABS.

C8. All in all the projects seem technically sound. The allocation between actual work and coordinative activities needs to be examined. It must be realized that biodiversity and carrying capacity issues relate more to research topics than practical studies such as aquaculture \, assessing contaminants, and stock assessment. The subject of data archival and management is a major cost and does not receive enough attention.

C9. D2. Identification of global environmental benefits and or drawbacks. The benefits are of course important for the region, which involves a significant share of the world’s population. If the project

meets its goals than its interaction with similar projects could generate a raising of the bar in the management of coastal ecosystems.

C10. D3. Context of GEF goals—ok

C11. D4—Regional context—what about Japan and Russia etc?

C12. D5—Replicability—good if resources are somehow put into facilitation replicability.

C13. D6—the project appears to be sustainable—it is important that it focuses on doing the work and not concentrating on coordination and communication. Coordination and communication are important. At the same time it is important to focus on substance.

C14. With regard to the secondary issues the capacity building is critical—it needs further direction.

C15. A closing comment relates to the concern about time phasing of project components—this needs to be spelled out in somewhat wore detail and specific resources need to be identified to endure timely deliver if the concern about lags is to be minimized.

C16. All in all this project seems to be on the right track.

ANNEX C1 RESPONSE TO STAP/COUNCIL/IA COMMENTS

Comments on STAP Review

C1-1. The STAP review raised several important issues that required clarification. As usual, since the Project Brief is so short, many of the details that were raised by the STAP review could not be addressed adequately in the body of the document. However, some items have been addressed in the revised Project Document. Some issues are addressed in this Annex specifically; the remainder will be addressed in the Project Document in more detail.

C1-2. Items raised by the STAP Review and specific responses include:

C1-3. 1) "Meanings of phrases need to be spelled out in concrete terms" (ecosystem-based management, environmentally sustainable, reducing development stress, and sustainable development): These terms are generally accepted terms, whose meaning depends on the actual application. As part of the Work Plan preparation during the Implementation Phase of the YSLME, these terms will be clarified and the manner in which components, sub-components, and activities will relate to these terms will be transparent.

C1-4. 2) "The practical implementation of the project and major weight of the project are weighted more towards process rather than substance." Process is a major aspect of the TDA/NYSAP/SAP process. The process will lead to stockholder participation, to country ownership, and to a sustainable YSLME project/programme. The process will lead to concrete results, including facilitation of SAP implementation, networking, communications, regional coordination, and so on. The process is an important component of the GEF TDA/NYSAP/SAP process; without this process, actions may take place with no sustainability. The Actions evolve from the process of the TDA/NYSAP/SAP: this is the essence of the Strategic Action Programme. However, Component IV, which the STAP reviewer attributed primarily to process, in fact has more than $3 million in substance associated with the financial instruments, including funds for early implementation of some aspects of the SAP. Therefore, there is considerable attention to actions and outputs even in component IV.

C1-5. 3) "It is not clear that sufficient resources are committed to the development of laboratory and computer facilities and the training of technicians and scientists." The equipment and training budgets were developed in concert with the countries. The budget reflects what they see as their needs. Since the facilities are generally well equipped compared to some other regions, the needs for facilities and training are different in the YSLME than in other GEF Projects. However, there is sizeable budget allocated to these activities, as reflected in Component IV. These activities are related to regional coordination, regional capacity building, stakeholder involvement, and the like.

C1-6. 4) "If the project is to be transferable among other regions, then it is necessary to devote resources to global interchange of information." This project will network with the IWLearn project, which is intended to share global experiences. It also will network with the Global International Waters Assessment (GIWA) to share learned experiences. Such collaboration and exchange are required if the GEF is to obtain full benefit of this project.

C1-7. 5) Allocation of resources: "Nearly 40 % of project costs are allocated to the project component development of regional institutions and capacities." This portion of the project costs will address issues related to 3) above, reflecting the importance being placed on developing regional capacities. Component IV is much more than just development of regional institutions and capacities: the financial instrument

sub-component of $3 million is allocated for development of priority investment portfolio, and includes funds to fund early portions of SAP implementation, a major goal of the GEF intervention.

C1-8. 6) D1. Scientific and Technical Soundness: Component IV: "it appears the weight of this component and the program as a whole are oriented to communication and coordination. I am not sure this is the best use of funding." Component IV relates to many aspects of the YSLME project. It includes the overall YSLME Coordination including the Project Coordination Unit, international staff, and the like. It also includes the Regional Capacity building. It includes the involvement of a broad spectrum of stakeholders. Finally, and perhaps most importantly, this component includes the Financial Instruments including priority investment portfolio, which includes funds to implement concrete portions of the Strategic Action Programme. This financial instrument section is approximately $3 million, and represents the heart of this phase of the GEF intervention. Finally, this component includes the Data and Information Management activities, which the STAP review alludes to as being of prime importance. Therefore, Component IV includes many sub-components which weight it heavily financially, but which are essential items to making this GEF intervention both successful and sustainable.

C1-9. 7) Component I: "investigating carrying capacity needs to be defined in the context of inter-annual and inter-decadal variability." The Project Brief acknowledges this need, and has set the time scale for investigation at the inter-decadal scale rather than the annual scale. Multi-year reviews and reanalysis of carrying capacity are proposed in light of these requirements.

C1-10. 8) Component II: "will be difficult to execute in a cost-effective way since biodiversity means many things to many people." The Project Brief focuses on biodiversity conservation in a practical manner, and doesn't suggest a pure academic approach. Huge losses of habitat have occurred in the Yellow Sea. Significant reduction in biodiversity of species has occurred. Thus, the analysis of biodiversity occurs in the context of a large signal from the past decades, and the interventions to address biodiversity issues therefore will be relatively clear. In some other IW GEF projects, biodiversity losses are minimal; this is not the situation in the Yellow Sea. This YSLME intervention should lead to concrete opportunities for conserving global biodiversity, and present investment opportunities on a national, GEF, and development bank perspective.

C1-11. 9) Data archiving: "The subject of data archival and management is a major cost and does not receive enough attention." The Project Brief separates out costs for data archiving and management. It is the subject of Sub-component IV.E, data and information management. The GEF intervention is nearly $400, 000. The Government co-finance is about $80,000. In addition to these costs, the data archiving and management costs are provided in each sub-component for I, II, and III. Given GEF experience in other regions, the necessity for data archiving and management is clear. The present project builds on these lessons learned. Examination of Sub-component IV.E and its related activities will demonstrate a logical, progressive approach to effective regional data and information sharing and management. This money will not be used to build new institutions, but rather to link existing institutions and data sources to facilitate effective sharing.

C1-12. 10) Schedule: "time phasing of project components – this needs to be spelled out in somewhat more detail and specific resources need to be identified to ensure timely delivery if the concern about lags is to be minimized." In GEF IW projects such as the Caspian Sea, the schedules and specific allocation of resources takes place once the project starts. The Project Brief budget and schedules are based on a detailed spreadsheet, some 40 pages long, of expected project schedule and cost allocation. However, the detailed work plans for each sub-component will be developed with full regional input once the implementation of the GEF Project starts. These detailed work plans will clarify the scheduling and cost implications, refining the present estimates; it will be the job of the PCU to assure the coordination and harmonization of the various work elements.

ANNEX D DETAILED LIST OF ACTIVITIES

Objective / Outputs	Activities		
	I. Assessing Stress to the Ecosystem/ TDA	**II. Reducing Stress to the Ecosystem/ SAP Preparation and Associated Capacity Building**	**III. SAP Implementation**
Objective I: Develop Regional Strategies for Sustainable Management of Fisheries and Mariculture			
Components: I A. Stock assessment	Regional Stock assessment/ Review of existing data and diagnosis of condition of stocks. Perform demonstration of a Regional Survey.	Develop common methodology for joint regional stock assessment and perform initial joint regional stock assessment.	Create mechanism for regional annual multi-species stock assessment, by introducing legal/policy reforms to overcome existing barriers.
I B. Carrying capacity in fisheries and mariculture	Review of existing state-of-knowledge and preliminary carrying capacity analysis (retrospective) and define gaps	Fill the knowledge gaps for carrying capacity analysis. Perform iterative series of analysis of carrying capacity	Annual carrying capacity determination
I C. Mariculture production	Review existing status and trends of mariculture.	Develop joint applied research program for sustainable mariculture. Pilot demonstration projects in mariculture. Develop projections of mariculture activity and carrying capacity for the next decade.	Assist region to implement more broadly proven sustainable mariculture techniques. Assist countries to develop sustainable mariculture legal and policy reforms.
I D. Disease in mariculture	Review existing state of knowledge of disease in mariculture, particularly emphasizing emergent diseases.	Joint development and demonstration of new methods for diagnosis, prevention, and control. Develop proposals for legal and policy reforms to reduce transfer of mariculture disease.	Facilitate networking about new diseases, diagnoses, and control techniques. Enact and enforce legal and policy reforms for mariculture.

Objective / Outputs	Activities		
	I. Assessing Stress to the Ecosystem/ TDA	**II. Reducing Stress to the Ecosystem/ SAP Preparation and Associated Capacity Building**	**III. SAP Implementation**
I E. Regional agreements and National laws	Review existing national laws and regulations on fisheries and mariculture, and pertinent international agreements.	Development and endorsement of bilateral or regional agreement for sustainable use of fisheries resources and mariculture. Propose measures for strengthening laws and regulations, and enforcement.	Facilitate implementation of regional agreement for sustainable use of fisheries resources. Strengthening and enforcement of National and regional fisheries laws and regulations.
I F. Management plan		Development of Regional fisheries management plans, including regional recovery programme.	Implementation of Regional Fisheries and ecosystem Management Plans, including regional recovery programme.
Expected Outputs:	Knowledge of fishery stocks/legislation and regulations summarized	Common methodologies and management plans developed	Demonstration projects piloted.
Objective II: Propose and Implement Effective Regional Initiatives for Biodiversity Protection			
Components: II A. Habit conservation	Review existing national status and practices of coastal habitat use, conservation, and restoration. Assessment of habitat quality for spawning of commercially imported fish.	Develop regionally coordinated strategies of conservation and restoration of habitats. Identify priority locations for the creation of new protected areas.	Implement Regional Strategy for Conservation Areas.
II B. Vulnerable species	Conduct national review of status of vulnerable species and vulnerable trophic linkages.	Formulate regionally coordinated strategies for protection of vulnerable species.	Implementation of regionally coordinated strategies for protection of vulnerable species.
II C. Genetic diversity	Determine situations of genetic degradation of important bio-resources.	Develop regional consensus on the requirements for conservation of gene pool. Develop recommendations for conservation of specific gene pool.	Implement recommendations to conserve gene pool.
II D. Introduced species	Document introduced exotic species and their pathways, assess impacts and risks. Liaise with Ballast Water GEF Project.	Proposals for strategies for regulation and control of exotic species.	Implement strategies for regulation and control of introduction of exotic species, including necessary legal, policy,

Objective / Outputs	Activities		
	I. Assessing Stress to the Ecosystem/ TDA	**II. Reducing Stress to the Ecosystem/ SAP Preparation and Associated Capacity Building**	**III. SAP Implementation**
			and institutional reforms at national and regional levels.
II E. Biodiversity Regulations	Review national regulations and effectiveness of protection measures.	Develop proposals for legislative reform that support protection of globally significant biodiversity.	Implement legislative reform.
II F. Regional Biodiversity Assessment and regional Biodiversity Action Plan	Coordinate regional biodiversity assessment. Clarify regional priorities for biodiversity protection.	Develop Regional Biodiversity Action Plan including investment strategy.	Implementation of Regional Biodiversity Action Plan including investment strategy.
Expected Outputs:	Biodiversity status summarized.	Regional Biodiversity Strategy drafted.	Implementation of Regional Biodiversity Strategy started.
Objective III: Propose and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality and Protect Human Health			
Activities: III A. Stressors to ecosystem	Identify and clarify the natural and human-induced stresses on the ecosystem; identify data and information gaps	Identify corrective measures to minimize the human-induced stress. Identify policies and legal measures to reduce the stress. Develop strategy to identify long-term sustainable investments to improve the YSLME.	Implement corrective measures to minimize the human-induced stress. Implement policies and legal measures to reduce the stress. Enact measures to secure required investment.
III B. Carrying capacity of ecosystem	Assess the carrying capacities of the ecosystem under changing human-induced and natural variability; identify data and information gaps: including demonstration of new and innovative technologies.	Develop strategies for monitoring changing status of ecosystem.	Pentadal state-of-ecosystem reviews and reports. Facilitate implementation of strategies for improving the ecosystem status.
III C. Contaminant inputs	Assess the contaminant and nutrient inputs into the YSLME. Fill data gaps with targeted monitoring.	Develop regional priorities and strategies to reduce contaminant and nutrients levels.	Facilitate implementation of these strategies; investment promotion activities including

Objective / Outputs	Activities		
	I. Assessing Stress to the Ecosystem/ TDA	**II. Reducing Stress to the Ecosystem/ SAP Preparation and Associated Capacity Building**	**III. SAP Implementation**
			transfer/development new technologies. Develop and implement legal/policy reforms to reduce contaminant input.
III D. Contaminant levels	Develop baseline data and summarize contaminant and nutrient levels in the YSLME.	Develop regional monitoring network strategy.	Communication, stakeholder involvement, develop funding mechanism to implement the monitoring strategy.
III E. HABs and Emerging disease	Comparative analysis of causes, patterns, and impacts of HABs and Emerging Diseases on bio-resources and human health.	Develop management and mitigation strategies	Facilitate regional management and mitigation implementation. Monitor HABs and emerging diseases in YSLME.
III F. Hot spots analysis	Identify hot spot sources of water quality degradation, depending on existing data, to support the countries' decision-making process.	Develop investment strategies for remediation of hotspots.	Facilitate implementation procedures for re-mediation and prevention; secure financing.
IIII G. Emergency planning and preparedness	Assess national emergency and contingency capabilities for transboundary contaminants.	Develop strategies for rapid and long-term regional responses to catastrophic causes of pollution; prepare regional contingency plans; assist with emergency planning and preparedness on a regional basis.	Facilitate regional actions to enable contingency planning: harmonizing customs, training.
IIII H. Legal and regulatory	Review and compare national regulations and laws on water quality and pollution control.	Discuss and develop proposals for regional coordination and reform of legislation and regulations for improving water quality.	Facilitate coordinated actions to improve regional water quality legislation and regulation

Objective / Outputs	Activities		
	I. Assessing Stress to the Ecosystem/ TDA	**II. Reducing Stress to the Ecosystem/ SAP Preparation and Associated Capacity Building**	**III. SAP Implementation**
IIII I. Fate and transport analysis to facilitate SAP analysis	Review existing understanding of fate and transport of contaminants, including modeling.	Develop regional strategies for assessing the fate, transport and risks of contaminants and nutrients.	Perform fate and transport analyses for management and policy development, including EIA process, ICZM. Develop regional training activities for environmental risk assessment; facilitate use of risk assessment in investment decisions.
Expected Outputs:	Date collected and regional assessments performed.	Regional Strategy drafted (which contains priorities and monitoring system).	Implementation of Strategy started.
Objective IV: Develop and Pilot Regional Institutional and Capacity Building Initiatives			
Activities: IV A. Stakeholder involvement	Identify stakeholders and decision-makers and assessment of their capacities for contributing to environmental management and decision-making.	Develop strategies to strengthen capacities for stakeholder involvement in the YSLME.	Encourage routine and effective involvement of stakeholders in environmental and resource management and decision-making.
IV B. Regional coordination	Create a functioning regional coordination mechanism to carry out the YSLME Project Preparation of TDA.	Identify modes to sustain the regional coordination mechanism, through regional agreements. Preparation of NYSAP. Preparation of SAP.	Assist the Region in maintaining an effective regional coordination mechanism for the YSLME.
IV C. National institutions	Review and assess national institutions to support YSLME. Establish National Coordination Unit within existing institutional framework to assure intersectoral coordination in	Identify means to develop these national institutions into sustainable contributors to the YSLME. Develop proposals to strengthen national institutions to enhance their ability to	Facilitate national institutions to be effective stewards of the YSLME.

Objective / Outputs	Activities		
	I. Assessing Stress to the Ecosystem/ TDA	**II. Reducing Stress to the Ecosystem/ SAP Preparation and Associated Capacity Building**	**III. SAP Implementation**
	TDA/NYSAP/SAP process.	contribute to environmental management and decision-making.	
IV D. Financial instruments	Review status and potential for financial sustainability of YSLME regional institutional framework. Review regional capacity building needs in context of transboundary analysis.	Provide training in environmental project identification and preparation. Develop a regional matched small environmental grants program to encourage innovation in addressing regional environmental problems. Provide funding for pre-feasibility studies of promising technologies and industries to help achieve the goals of the YSLME, to create an investment portfolio (Priority Investment Portfolio). Identify a mechanism for participation by international development banks to learn of investment opportunities in the YSLME.	Assist and encourage the continuation of the project preparation and feasibility studies for long-term environmental investment to implement the SAP and NYSAPs. Assist the Region to implement the mechanism for routine review of YSLME investment portfolio.
IV E. Data and information management	Determine regional data and information management capabilities.	Develop an effective regional DIM strategy to help achieve the goals of the YSLME. Identify possible regional agreements or other mechanisms to sustain the DIM role.	Facilitate implementation of the sustainable regional mechanism for DIM for effective management of the YSLME. Implement the regional DIM strategy, including equipment, facilities, and communications.
IV F. Public awareness and participation	Assess level of regional public awareness of YSLME issues.	Demonstrate a broad-based regional public awareness/participation campaign. Develop a public awareness and public participation strategy for the YSLME, with active regional participation.	Encourage and facilitate ongoing public awareness and participation activities to help achieve the goals of the YSLME.
Expected Outputs:	Create network for institutions and individuals.	Develop strategy for participation, coordination, and awareness.	Implement a sustainable, regional program for cooperation, coordination, and management.

ANNEX E PRELIMINARY TRANSBOUNDARY DIAGNOSTIC ANALYSIS

(separate attachment)

ANNEX F PUBLIC INVOLVEMENT PLAN SUMMARY

1. Categories of stakeholders who will be involved in the project include the national and local governments in the participating countries, the private sector, the scientific community, non-government organizations, environmental advocacy groups and people's organizations. The participatory approach is the guiding principle to ensure transparency in the planning and execution of project activities. The stakeholders are the direct beneficiaries of the project.

2. Within the project, activities for public involvement include, under Regional Institutional and Capacity Building, Stakeholder subcomponent IVA and Public Awareness and Participation subcomponent IVE. Together, the Public Involvement Plan includes a budget of more than three-quarters of a million dollars. In addition to these activities, one internationally recruited PCU staff member will be a Public Participation and Awareness specialist, who will liaise with the Stakeholders. Adding this staff member to the Public Involvement Plan budget shows more than $1 million is devoted to Public Involvement.

The specific involvement of stakeholders throughout the project is given below.

STAKEHOLDER	INVOLVEMENT
National governments	Consultation, implementation, steering committees, international conventions, policy, legislation, investment, capacity building, public-private partnerships, institutional reform
Local governments	Consultation, implementation, coastal management, capacity building, investment, public-private sector partnerships, national steering committees
Private sector: including fishermen, fishing companies, oil and gas sector, shipping and marine transport industry, etc.	Consultation, technology and financial investment, public-private partnerships, steering committee and management advisory committee membership, participation in TDA/NYSAP/SAP process, post-SAP implementation phase
Scientific community	Consultation, research, information technology, risk assessment, monitoring, training
Non-government organizations	Consultation, implementation, public awareness, steering committee and management advisory committee membership, training, participation in TDA/NYSAP/SAP processes.
Community-based organizations, youth and women	Consultation. Monitoring, training, community mobilization
Environmental advocacy group	Workshop, training, seminars, public awareness
People's organization	Community mobilization, habitat protection

3. Since the purpose of the project is to build partnerships, relevant stakeholders will need to be integrated into the project formulation and implementation activities as early as possible. The idea is to identify and develop the role and specific contribution to be made by each interest group within the project framework.

ANNEX G BASELINE ACTIVITIES AND CO-FINANCING

Immediate Objective	Component	Korea			China		
		Baseline	Co-financing	Total	Baseline	Co-financing	Total
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	A.Stock assessment	1,887,500	1,062,500	2,950,000	14,243,373	0	14,243,373
	B.Carrying capacity	0	80,000	80,000	963,855	0	963,855
	C.Mariculture production	57,670,833	0	57,670,833	908,434	963,855	1,872,289
	D.Disease in mariculture	160,000	0	160,000	286,747	0	286,747
	E.Regional agreements and National laws	45,833	0	45,833	0	0	0
	Mixed Components					1,759,036	
TOTAL OBJECTIVE:		**59,764,166**	**1,142,500**	**60,906,666**	**16,402,409**	**2,722,891**	**19,125,300**
II. Promote and Implement Effective Regional Inititatives for Biodiversity Protection	A.Habitat	13,550,002	0	13,550,002	1,204,819	0	1,204,819
	B..Vulnerable species	0	0		0	0	0
	C.Genetic diversity	2,561,666	0	2,561,666	0	0	0
	D.Introduced species	0	0		0	0	0
	E.Regulations	0	0		0	0	0
	F.Regional assessment & biodiversity plan	0	0		602,410	0	602,410
	Mixed Components					1,759,036	
TOTAL OBJECTIVE:		**16,111,668**	**0**	**16,111,668**	**1,807,229**	**1,759,036**	**3,566,265**
III. Promote and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality, and Protect Human Health	A.Stressors to ecosystem	8,859,978	0	8,859,978	12,891,566	0	12,891,566
	B.Carrying capacity of ecosystem	0	480,000	480,000	0	0	0
	C.Contaminant inputs	36,667	0	36,667	0	0	0
	D.Monitoring contaminant levels	2,843,333	320,000	3,163,333	9,036,145	0	9,036,145
	E.HABs and Emerging disease	285,000	0	285,000	10,939,759	0	10,939,759
	F.Hot spots analysis	517,500	0	517,500	7,277,108	0	7,277,108
	G.Emergency planning and preparedness	155,000	0	155,000	0	0	0
	H.Legal and regulatory	33,333	0	33,333	0	0	0
	I.Fate & transport analysis to facilitate SAP	1,079,166	0	1,079,166	361,446	0	361,446
	Mixed Components					1,759,036	
TOTAL OBJECTIVE:		**13,809,977**	**800,000**	**14,609,977**	**40,506,024**	**1,759,036**	**42,265,060**
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	A.Stakeholders	0	0		0	0	0
	B.Regional coordination	187,500	0	187,500	0	0	0
	C.National institutions	0	0		963,855	650,602	1,614,457
	D.Financial instruments	0	0		0	0	0
	E.Data and information management	216,290	80,000	296,290	518,072	0	518,072
	F.Public awareness and participation	11,776,667	0	11,776,667	0	0	0
	Mixed Components						
TOTAL OBJECTIVE:		**12,180,457**	**80,000**	**12,260,457**	**1,481,927**	**650,602**	**2,132,529**
Total Objectives		**101,866,268**	**2,022,500**	**103,888,768**	**60,197,589**	**6,891,565**	**67,089,154**

ANNEX G BASELINE ACTIVITIES AND CO-FINANCING (CONTINUED)

Immediate Objective	Component	ROK & PRC Combined		GEF	Donors	Alternative	YSLME
		Baseline	(GOV) Co-Financing				Project Total
I. Develop Regional Strategies for Sustainable Management of Fisheries, and Mariculture	A.Stock assessment	16,130,873	1,062,500	$1,646,072		18,839,445	18,839,445
	B.Carrying capacity	963,855	80,000	$226,642		1,270,497	1,270,497
	C.Mariculture production	58,579,267	963,855	$172,640		59,715,762	59,715,762
	D.Disease in mariculture	446,747	0	$120,750		567,497	567,497
	E.Regional agreements and National laws	45,833	0	$75,750		121,583	121,583
	Mixed Components	0	1,759,036	$75,000		1,834,036	1,834,036
TOTAL OBJECTIVE:		**76,166,575**	**3,865,391**	**$2,316,854**		**82,348,820**	**82,348,820**
II. Promote and Implement Effective Regional Inititatives for Biodiversity Protection	A.Habitat	14,754,821	0	$301,412		15,056,233	15,056,233
	B..Vulnerable species	0	0	$155,600		155,600	155,600
	C.Genetic diversity	2,561,666	0	$349,000		2,910,666	2,910,666
	D.Introduced species	0	0	$217,368		217,368	217,368
	E.Regulations	0	0	$121,140		121,140	121,140
	F.Regional assessment & biodiversity plan	602,410	0	$105,760		708,170	708,170
	Mixed Components	0	1,759,036			1,759,036	1,759,036
TOTAL OBJECTIVE:		**17,918,897**	**1,759,036**	**$1,250,280**		**20,928,213**	**20,928,213**
III. Promote and Implement Actions to Reduce Stress to the Ecosystem, Improve Water Quality, and Protect Human Health	A.Stressors to ecosystem	21,751,544	0	$162,140		21,913,684	21,913,684
	B.Carrying capacity of ecosystem	0	480,000	$428,760		908,760	908,760
	C.Contaminant inputs	36,667	0	$161,412		198,079	198,079
	D.Monitoring contaminant levels	11,879,478	320,000	$100,320		12,299,798	12,299,798
	E.HABs and Emerging disease	11,224,759	0	$158,640		11,383,399	11,383,399
	F.Hot spots analysis	7,794,608	0	$299,280		8,093,888	8,093,888
	G.Emergency planning and preparedness	155,000	0	$151,320		306,320	306,320
	H.Legal and regulatory	33,333	0	$79,760		113,093	113,093
	I.Fate & transport analysis to facilitate SAP	1,440,612	0	$352,840		1,793,452	1,793,452
	Mixed Components	0	1,759,036			1,759,036	1,759,036
TOTAL OBJECTIVE:		**54,316,001**	**2,559,036**	**$1,894,472**		**58,769,509**	**58,769,509**
						0	
IV. Develop and Pilot Regional Institutional and Capacity Building Initiatives	A.Stakeholders	0	0	$316,500		316,500	316,500
	B.Regional coordination	187,500	0	$3,187,291		3,374,791	3,374,791
	C.National institutions	963,855	650,602	$480,020		2,094,477	2,094,477
	D.Financial instruments	0	0	$3,007,840		3,007,840	3,007,840
	E.Data and information management	734,362	80,000	$383,530		1,197,892	1,197,892
	F.Public awareness and participation	11,776,667	0	$491,160		12,267,827	12,267,827
	Mixed Components		0			0	0
TOTAL OBJECTIVE:		**13,662,384**	**730,602**	**$7,866,341**		**22,259,327**	**22,259,327**
Total Objectives		**162,063,857**	**8,914,065**	**$13,327,947**		**184,305,869**	**184,305,869**

ANNEX H LIST OF PUBLICATIONS PREPARED DURING THE PDF-B

1. Report of the 2nd Regional Workshop and the Third Meeting of the Steering Committee of the Yellow Sea Large Marine Ecosystem (YSLME), held on 18-20 January 2000 in Beijing, PRC.

2. Report of the 1st Regional Workshop and the Second Meeting of the Steering Committee of the Yellow Sea Large Marine Ecosystem (YSLME), held on 26-29 October 1999 at Seoul, ROK.

3. Report on the First Meeting of the Steering Committee of the Yellow Sea Large Marine Ecosystem (YSLME), held on 10-11 August 1999 at Beijing, PRC.

4. Report on the Regional Workshop for the Project Brief of the Yellow Sea Large Marine Ecosystem (YSLME), held on 5-6 November 1999 at Qingdao, PRC

5. Report of the Second National Stakeholders' Workshop held on 28 September at Seoul, ROK.

6. Report Of the Second National Stakeholders' Workshop-PRC.

7. Report of the First National Stakeholders' Workshop-held on 15 July 1999 at Seoul, ROK.

8. Report of the First National Stakeholders' Workshop-held on 10 June 1999 at Qingdao, PRC.

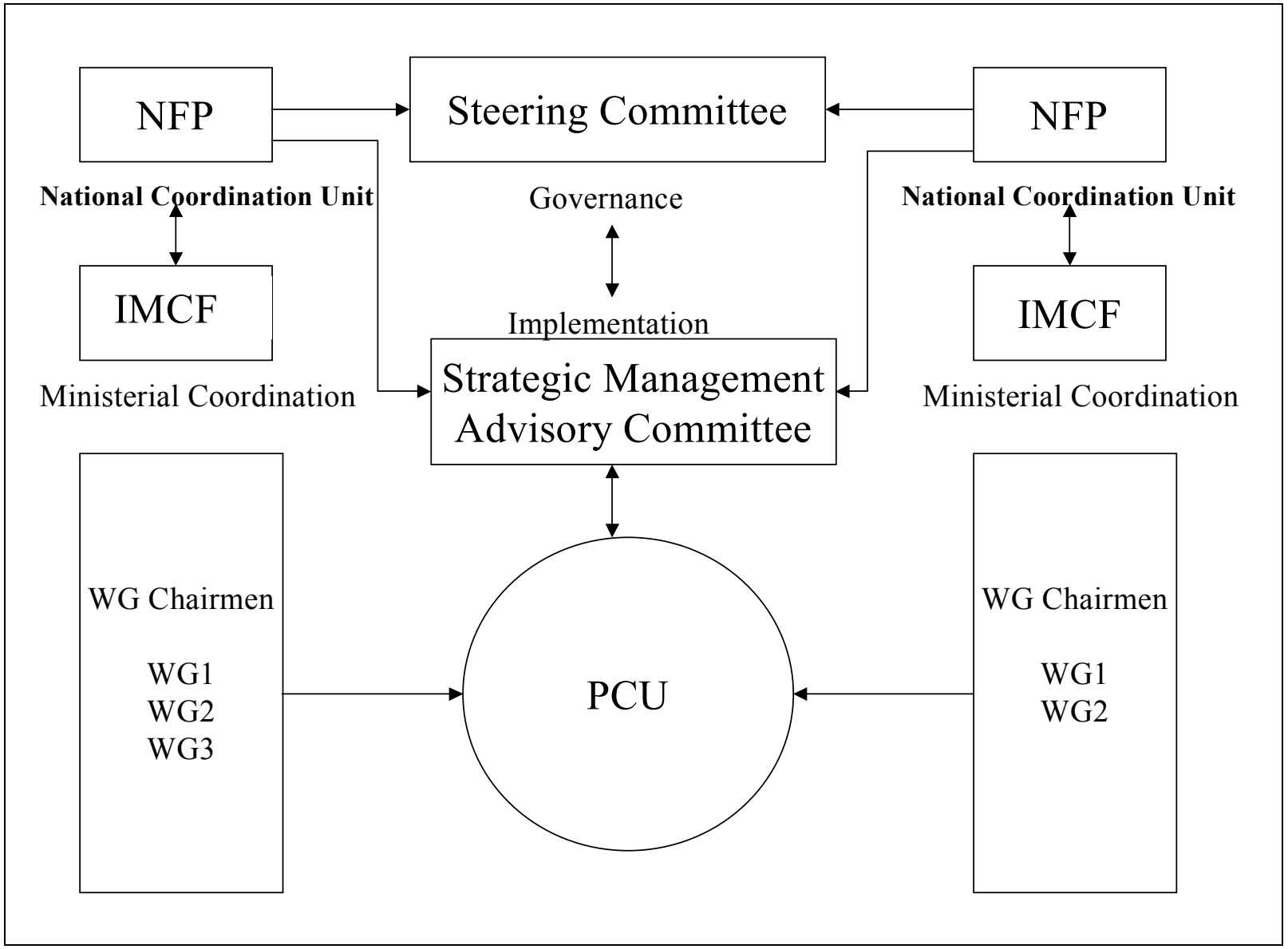
9. Yellow Sea LME Transboundary Diagnostic Analysis, Preliminary Draft, November 1999

10. National Report of PRC "Yellow Sea LME"

11. National Report of ROK "Yellow Sea LME"

12. Final Inception Report of the Inception Mission from 13-27 April 1999 in ROK and PRC.

ANNEX I INSTITUTIONAL ARRANGEMENTS



ANNEX J

Copies of GEF Operational Focal Point Endorsement Letters

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