UNDP/GEF PROJECT ENTITLED "REDUCING ENVIRONMENTAL STRESS IN THE YELLOW SEA LARGE MARINE ECOSYSTEM"

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Fifth Meeting of the Regional Scientific and Technical Panel for the UNDP/GEF Yellow Sea Project
Shanghai, China, 25-26 November 2008

and

Fifth Meeting of the Project Steering Committee for the UNDP/GEF Yellow Sea Project
Shanghai, China, 27-28 November 2008

PROJECT IMPLEMENTATION REPORT 2008

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1 INTRODUCTION

1. With the full participation and close co-operation of all parties of the project, the implementation of the project activities in 2008 has marked milestones in the protection of marine environment in the Yellow Sea.

2. ***Co-operation mechanism strengthened***. During the implementation of the project activities since the last PSC met, the co-operation mechanism among the governments of the participating countries has been strengthened. Some critical agreements for implementation of important project activities have been reached, including the agreement on co-operative cruises, joint regional stock assessments and the SAP. The participating governments have showed their high intentions in protecting marine environment and sustainable use of marine and coastal resources, strong co-operative spirit and high flexibilities in the negotiation of some sensitive issues. At the same time, the co-operation mechanism with NGOs has also achieved substantive progress during 2008. There were several important activities organised to involvement DPRK in the project, with financial support from the participating countries.

3. ***Strategic Action Programme prepared and agreed.*** As one of the most important project outcomes, the Strategic Action Programme was prepared and agreed upon by the PSC at its second special meeting. The ecosystem-based approach used in the SAP produced the first action plan of its kind within the GEF projects. With tangible targets identified, dedicated actions proposed and the YSLME Commission as the implementation mechanism, the SAP document paves a solid foundation for protection of the marine environment in the Yellow Sea.

4. ***Co-operative cruise organised with important data and information collected.*** With final agreement by the governments of participating countries, co-operative cruises were organised in winter and summer. A launching ceremony was organised with participation of governmental officers at vice-minister level, and UNDP representatives and representatives from local governments of the provinces bordering the Yellow Sea. The co-operative cruises have collected useful data and information to show the basin-wide situation in the Yellow Sea, including the impacts of climate change to the marine ecosystem in the Yellow Sea.

5. ***Considerations of implementation of SAP***. With the agreement on the SAP, the PSC instructed the PMO to start the preparation of the relevant documents to apply for the 2nd phase of the project: the implementation of SAP. Necessary activities have been organised. This initiative indicated the readiness of the participating countries to engage themselves in the systematic actions to improve the marine ecosystem in the Yellow Sea. China is exploring possibilities to provide co-financial resources for the next phase. ROK expressed its willingness to provide financial support for the implementation of SAP, as the country is no longer eligible for the GEF funding. DPRK is positively considering its participation in the project.

2 MAJOR ACHIEVEMENTS SINCE THE LAST MEETING

2.1 Co-operative Cruises Successfully Implemented

6. The 12th January 2008 was a memorable day for the project, as the co-operative cruises between China and Republic of Korea got underway after numerous negotiations and discussions on this activity. A “Cruise Launching Ceremony” was

organized by State Oceanic Administration (SOA), China, and its North Sea Branch in Qingdao, China, on 12th January 2008 with speeches given by:

- High-level government officials from China and Republic of Korea: Dr. LEE In Soo, Commissioner, Korea Maritime Safety Tribunal, MOMAF, Mr. WANG Fei, Deputy Administrator, SOA;
- Mrs. Alessandra Tisot, Senior Deputy Resident Representative, UNDP Beijing;
- Prof. ZHU Mingyuan, Co-Chief Scientist of the Cruise; and
- Mr. JIANG Yihang, Project Manager;

7. The ceremony was attended by numerous scientists from China and Republic of Korea, the research vessel's crew and on-board scientists (Fig. 1), and North Sea Branch naval officers. Provincial and city government officials from the Ocean and Fisheries Bureau of Shandong and Liaoning Province, as well as Qingdao and Dalian City were present to show their support for the project and the co-operative cruise (Fig. 2).

8. The winter cruise was carried out during January 2008. Despite the harsh winter weather, and many days of ports calls to avoid strong winds at sea, the 19 scientists from Republic of Korea and China on board the Hai Jian 17 Research Vessel, belonging to SOA's North Sea Branch, were able to carry out surveys in the Yellow Sea for 22 days. Plankton, sediment, benthos, and water samples were collected and were analysed for nutrients, organics, trace metals, sediment profile, taxonomic composition of plankton, zooplankton, benthic organisms, pigments, and bacteria. Results were presented in May and during the 5th RWG-E and RWG-P Meetings:

- Chl-a concentration was observed to have very high values overall, about 3 times higher than normally expected winter values; however the results were comparable to HPLC pigment values.
- A comparison of China and ROK's phytoplankton species from water samples showed that the data from China contained more dinoflagellates, while the data from ROK contained more diatoms.
- Inter-comparison of macrobenthos taxonomical results revealed some differences between China and ROK.
- The ^{210}Pb profiles for deposition rates of C, N, and P were shown to be higher compared to other studies.

9. The summer cruise was successfully held in July 2008. Seven scientists from Republic of Korea and 14 scientists from China boarded the "Xiang Yang Hong 9" research vessel and completed their survey of 37 sampling stations. Similar to the winter co-operative cruise held in January, samples of plankton, benthos, and water samples were collected and are now being analysed for nutrients, organics, trace metals, taxonomic composition of plankton, zooplankton, benthic organisms, pigments, and bacteria (Figs. 3-5). Results are available starting in October. Preliminary results showed some typhoon effects on seawater temperature. As a final product of this activity, regional cruise reports will be compiled by the Chief Scientists once all results are in.

10. All differences in, and non-comparable results are under-going further investigation. Data continue to be exchanged between the various groups in order to harmonise these differences. A final review of results will be carried out next year, with the ultimate results presented in a regional cruise report that will be prepared by the Chief Scientists.

11. Besides acquiring new knowledge, the co-operative cruises marked an important historical event for the region. As many of the Yellow Sea's environmental problems are transboundary, this activity required the efforts of all players (countless people in the governments, research institutes, Project Management Office) in the region to overcome these troubles. The co-operative spirit of the littoral countries has allowed the first joint basin-wide survey of the Yellow Sea to be realised.

Figure 1. The on-board scientists for the winter cruise.

Figure 2. Launching ceremony for the co-operative cruises.

Figure 3. Water sampling.

Figure 4. Benthic organisms collected.

Figure 5. Jellyfish observation during the summer cruise.

2.2 Joint Regional Fisheries Stock Assessment

12. The Joint Regional Stock Assessment activity was conceived during the 4th RWG-Fisheries meeting to compensate for the lack of the fisheries involvement in the Co-operative Cruises. The differences in growth rates and size at maturity of certain fish species reported by the two countries had emphasised the need for a mechanism to harmonise the stock assessment techniques in the region. Working in collaboration, scientists from the Yellow Sea Fisheries Research Institute and West Sea Fisheries Research Institute discussed how to harmonise the methodology and gears used for fisheries stock assessment. During this 1st Stock Assessment Workshop (SAW), plans for the 1st joint regional stock assessment surveys were finalised and agreement was reached on a harmonised methodology, standardised data formats for exchange and the use of comparative trawling gears deployed behind the national research vessels.

13. The 1st stock assessment surveys successfully took place in May 2008; the results were presented at the 2nd SAW and the 5th meeting of RWG-Fisheries. Initial results suggested that larger mature small yellow croaker is more frequently caught in the Eastern Yellow Sea during the spawning season in May. The differences are less pronounced for Japanese anchovy although larger mature anchovy are more prevalent in the Western Yellow Sea in this season (Figure 6).

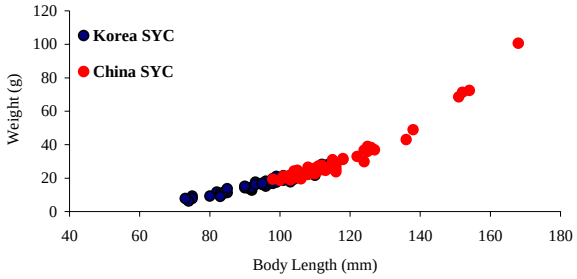


Fig 6a: Relationship between body length (mm) and weight (g) in small yellow croaker landings from R. Korea and China.

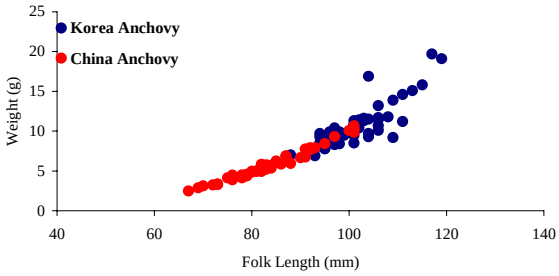


Fig 6b: Relationship between fork length (mm) and weight (g) in anchovy landings from R. Korea and China.

14. The survey revealed that the small yellow croaker was distributed in accordance with the spawning grounds (Figure 7) and a similar distribution was recorded for the anchovy (Figure 8).

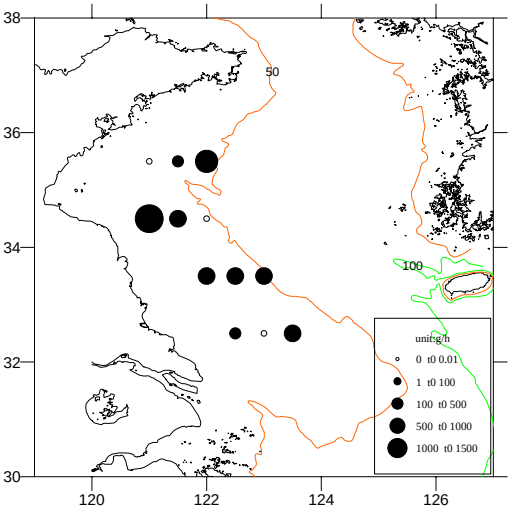


Fig. 7a: Catch distribution of small yellow croaker in Chinese survey.

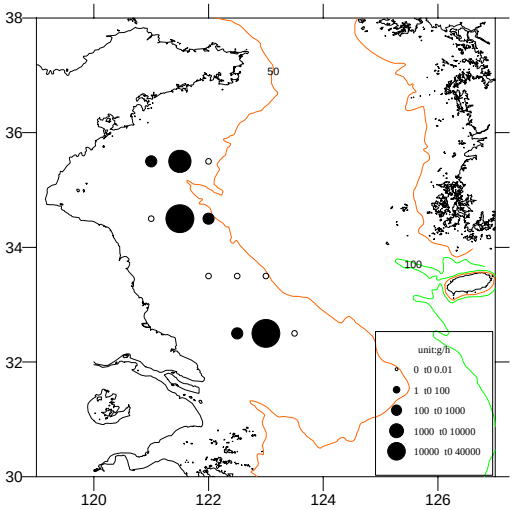


Fig 8a: Catch distribution of Japanese anchovy in Chinese survey.

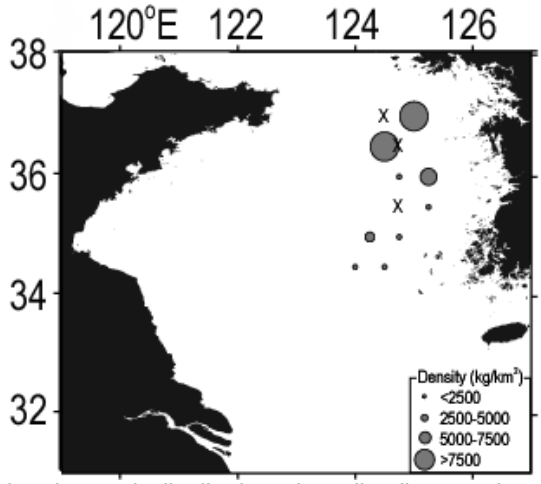


Fig. 7b: Catch distribution of small yellow croaker in R. Korea survey.

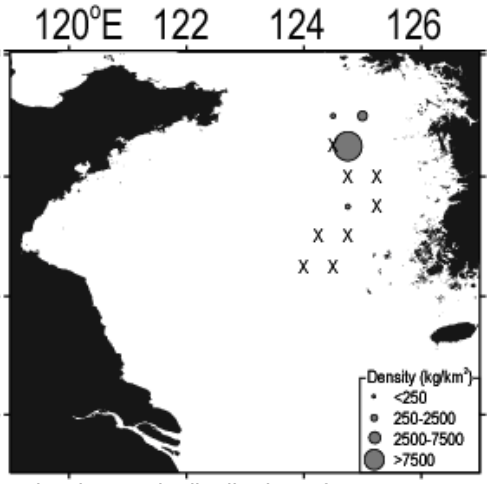


Fig 8b: Catch distribution of Japanese anchovy in R. Korea survey .

15. During the 2nd SAW, members refined the sampling strategy and data exchange mechanisms, selected the 5 target species to be analysed and finalised the data calibration techniques. To further standardise methodology in ageing and stomach

content analysis, an exchange of experts between these institutions was successfully instigated (please see fisheries report for outcomes).

16. This activity has made major steps forward in increasing the trust and mutual understanding between fisheries scientists in these 2 countries, as well as enhancing the co-operative mechanism for regional monitoring and observation. It has developed regionally agreed methods of observation, monitoring and sampling fish stocks and will contribute to a better understanding of these selected fisheries and provided momentum for future joint regional stock assessments.

2.3 Finalisation of the Strategic Action Programme, including PSAA

17. To address transboundary environmental problems in the Yellow Sea, identified by the TDA, the Project developed the SAP. Introducing an ecosystem-based approach, the SAP not only set regional management targets, but also devised management actions to achieve the targets. With the implementation of these actions that consisted of both technical and governance actions, the "ecosystem carrying capacity (ECC)" of the Yellow Sea will improve and thereby continue to provide the ecosystem services (Figure 9).

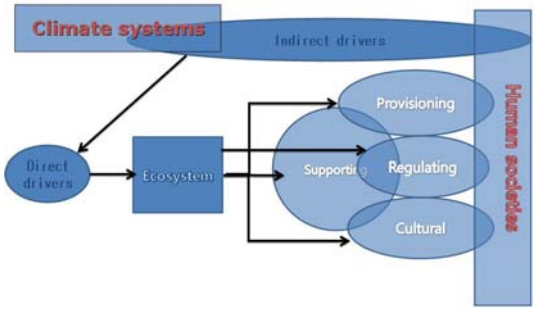


Fig 9: Relationship of ecosystem, ecosystem services, direct and indirect drivers, human societies, and climate system.

18. Several characteristics made the YSLME SAP unique compared to other SAPs. Firstly, the YSLME SAP employed the ecosystem-based approach rather than the traditional sector approach (Figure 10). This innovative approach would help in targeting multiple ecosystem services holistically to sustain the ECC of the Yellow Sea. Secondly, the SAP provided concrete and measurable targets such as the 25-30% reduction in fishing efforts. Lastly, the SAP proposed mechanisms for regional co-ordination and co-operation, including the YSLME Commission.

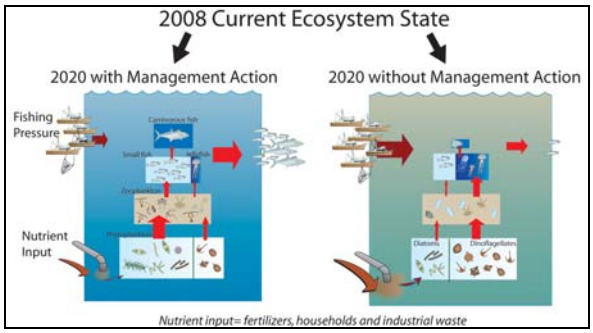


Figure 10: A simplified overview of the state of the ecosystem in 2020 with and without management actions.

19. To ensure the concerns of all stakeholders were addressed in the SAP, the following seven events were organised in 2007 and 2008: a consultation meeting, two drafting group meetings, three ad-hoc working group meetings, and the Special PSC

Meeting. Participants of those meetings included regional scientists, government officials, and other relevant stakeholders such as NGOs.

20. The special PSC meeting (Hangzhou, China, 8 May 2008) reviewed and approved the SAP as the final draft to be submitted to the participating governments for their consideration and endorsement. The final draft SAP was sent in May 2008 for NPCs as well as the members of the PSC to process the draft internally to secure endorsements from the participating countries.

21. To facilitate the government endorsement of the SAP, the Project conducted a Political and Social Acceptance Analysis in co-operation with the Korea University and the Ocean University of China. The PSAA analysed: (i) appropriateness of the management actions, (ii) consistency of the management actions with national policies and guidelines, and (iii) main problems, if any, in endorsing the SAP. Then, the PSAA recommended practical and concrete suggestions to address the problems. The results of the PSAA will be used as a reference to support the approval of the SAP.

2.4 SAP demonstration activities

22. SAP demonstration activities were proposed by all RWGs during the 4th Meeting in 2007 where each group based their recommendations after reviewing the management actions proposed in the draft SAP. Most of the Request for Proposal was advertised during the first half of this year, and a number of interested bidders replied. Activities for Biodiversity do not follow the same schedule as other components because the critical habitats and selection of demonstration sites had to first be done, which was completed during the middle of this year.

23. Following evaluation of all proposals, SAP demonstration activities were selected for implementation as listed in Table 1.

24. Targeting some of the key demonstration activities mentioned above, cost-benefit analyses will be conducted. It is expected that the CBA studies will display how economic analyses can be used for better ecosystem management with the cost-benefit information of the activities examined. Economic analyses will help governments and decision-makers choose or design management actions that will contribute to sustainable use of marine resources. In co-operation with the contractors of demonstration activities, CBA consultants will implement the analyses from late 2008 through mid/late 2009.

Component	Demonstration Activity Name	Contractor
Biodiversity	Will be carried out in Rongcheng seagrass beds including Swan Lake, China and Ganghwa Southern Tidal Flat, ROK	Advertised recently
Ecosystem	Monitoring Jellyfish Bloom in the Yellow Sea	NFRDI
	Assessing impacts of N:P:Si change on the Yellow Sea ecosystem	FIO
	Assessing and Monitoring the Impacts of Climate Change on the Yellow Sea's Ecosystem	FIO
Fisheries and Mariculture	Effectiveness of closed fishing seasons/areas	YSFRI
	Effectiveness of stock enhancement	YSFRI
	Effectiveness of boat buy-back	Pukyong National University
	Limited Water-exchange Shrimp Culture	NFRDI - West Sea Mariculture Research Center
	Integrated Multi-Trophic Aquaculture in the Yellow Sea	YSFRI
Investment	CBA of Mariculture	FIO
	CBA of other demonstration activities	Advertised recently
Pollution	Management of Recreational Waters	NMEMC
	Monitoring and Assessing Atmospheric Deposition of Pollutants	NMEMC
	Calculation of Nutrient Loads in Hot Spot Areas	NMEMC
	Monitoring and Assessing Sea-Based Sources of Nutrients	Liaoning Ocean and Fisheries Science Research Institute
Cross Component (Bio-Poll)	Managing Pollution in Critical Habitats around the Yellow Sea	Academy-Industry Cooperation Foundation, ROK

Table 1. List of SAP demonstration activities and the contractors.

2.5 Preparation of the National SAPs

25. The Project will develop the NSAP in line with the regional SAP, following the regional priorities and the concept and proposed activities of the SAP. Two NSAPs will be prepared: one for China and one for ROK.

26. The objective of the NSAP is "to implement necessary management actions to protect marine environment and sustainable use of coastal and marine resources at national level" (Document, "UNDP/GEF/YS/RWG-I.4/3," p. 5; Revised at 4th Regional Working Group for Investment Component [RWG-I] Meeting; Approved at 4th PSC Meeting).

27. The management actions of the NSAP will be prepared and implemented to meet national targets or priorities, and also regional targets defined by the SAP in order to address transboundary issues in the Yellow Sea.

28. It is expected that the NSAP will greatly contribute to and/or complement the implementation of the Regional SAP at the national level. The draft NSAPs will be presented to RSTP/PSC for their consideration.

2.6 Preparations for the SAP Implementation

29. Planning for the project's next phase has been on-going since the beginning of the year. The PMO familiarised itself with the GEF procedures for submitting a proposal, and held some internal discussions on how to proceed with this task.

30. Following the suggestion by the SAP Drafting Group and the SAP Ad-hoc Working Group, to establish a Phase 2 Ad-hoc Working Group for preparing relevant documents for the possible 2nd phase and the approval by the Second Special PSC Meeting (8 May 2008, Hangzhou, China), two Phase 2 Working Sessions were organised in August and October this year. At the first Working Session (26-28 August 2008, Dalian, China), a proposed list of activities was drafted, based on the SAP targets and management actions listed in the document. The members also discussed and agreed on the overall structure of the PIF.

31. The PMO prepared a draft PIF which was worked on by participants at the second Working Session (5-6 October 2008, Shanghai, China). The countries are examining their co-financing resources and are expected to give an update on how much in-cash and in-kind co-financing would be available. The draft PIF is under review by all three countries (China, ROK, DPRK).

32. There still remains quite a bit of work from all involved parties before the documents are finalised for submission to the GEF. It is hoped that everything will be ready for submission to the GEF some time before the end of 2009.

2.7 Progress in involvement of DPR Korea

33. Following the instructions from the PSC, efforts have been made by the participating countries and PMO to involve the DPRK in the project activities. The following activities were carried out with financial support from the participating countries:

34. ***Workshop on Introduction of the TDA and SAP Concepts***. In order to:

(i) provide opportunity for government officers and experts to become familiar with the GEF's procedure in preparation of TDA and SAP;
(ii) introduce the TDA and SAP development under the UNDP/GEF Yellow Sea Project, in particular the regional agreements on management targets and management actions; and
(iii) introduce the procedure to develop the project documents for the 2nd phase of the UNDP/GEF Project, i.e. implementation of SAP,

a workshop on introduction of the TDA and SAP concepts was organised in Dalian, China, 21-22 August with participation of 5 governmental officers from DPRK and representatives from China and ROK (Figure 11). The presentations on TDA and SAP development, its procedure and concepts were introduced to the participants. The presentations were well received. It was indicated that DPRK will take all possible actions to participate in the project fully.

35. The experts presented their strong interests in project implementation. Apart from critical questions raised during the workshop, it was noted that the full texts of the TDA and SAP documents have been translated into Korean language for better use of the experts from the country.

36. ***Training Course on Analysis of Metals and Nutrients in Marine Environment.*** With close co-operation with KORDI, the training course on Analysis of Metals and Nutrients in Marine Environment was organised in the National Marine Environment Monitoring Center in Dalian, 17-23 March 2008. There were 10 experts from DPRK that participated in the training course (Figure 12). The technical details were introduced to the experts, and the concept and procedure to design a monitoring programme were also presented to the training course.

Fig. 11. Left: Participants of the TDA/SAP Introduction.

Fig. 12. Right: Participants of the Metals and Nutrients Analysis Training Course.

Representatives of DPR Korea participated in several important meetings as observers.

37. For better understanding of the project implementation and to increase the interests of DPRK in the project, the government officers and experts were invited to participate in several important meetings of the project, including:

- The 4th RSTP and PSC meetings;
- The Special Meeting of the PSC on SAP;
- The 1st and 2nd Meetings of the Working Group for preparing relevant documents for the 2nd phase of the project

38. Through participating in these meetings, the officers and experts from DPRK received better understanding of the project, and strengthened their willingness to fully participate in the project.

3 PROJECT IMPLEMENTATION

3.1 Fisheries Component

3.1.1 Stock assessment

39. As mentioned previously, the joint regional stock assessment has been successfully implemented and the final surveys completed. The concluding workshop is scheduled for 14-16 April 2009 when participating scientists will have the opportunity to present the results of the surveys using the fully shared data.

40. The reports were received from scientists involved in the harmonisation exercises to standardise measurement of two vital parameters used in stock assessment that of ageing fish (using annual growth rings that are most clearly seen in the ear bones (otoliths)) and diet composition through the analysis of stomach contents. The reports suggested that diets of smaller sized anchovies in the western Yellow Sea were dominated by copepods; where as the bigger individuals found mostly in the eastern portion were mostly feeding on the larger sized euphausids (Fig. 13).

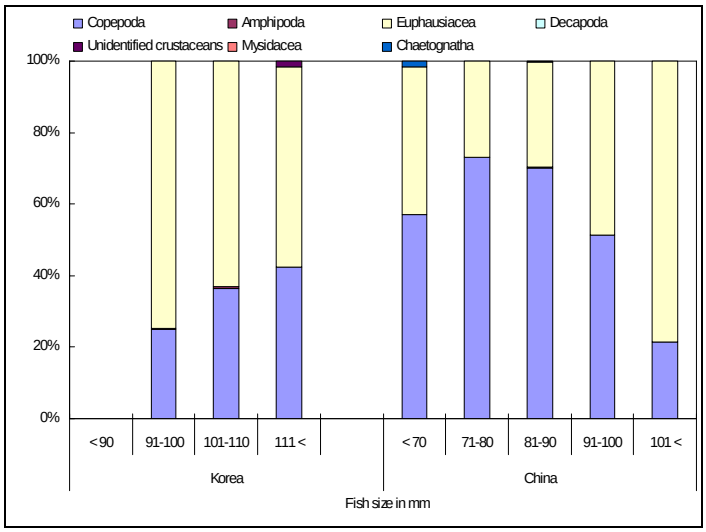


Fig. 13: Composition of stomach contents in a size range of Japanese anchovy

41. Similar results were reported for small yellow croaker with a direct correlation between the percentage of the diet occupied by larger prey items and the increase in fish size (Fig. 14).

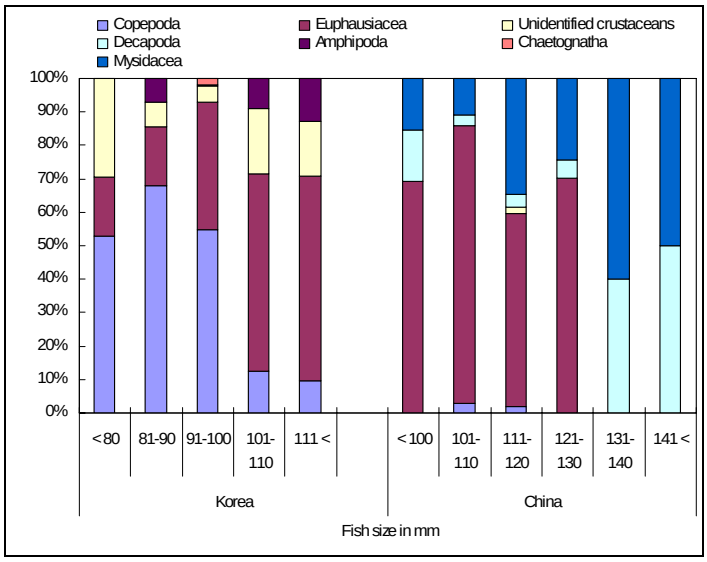
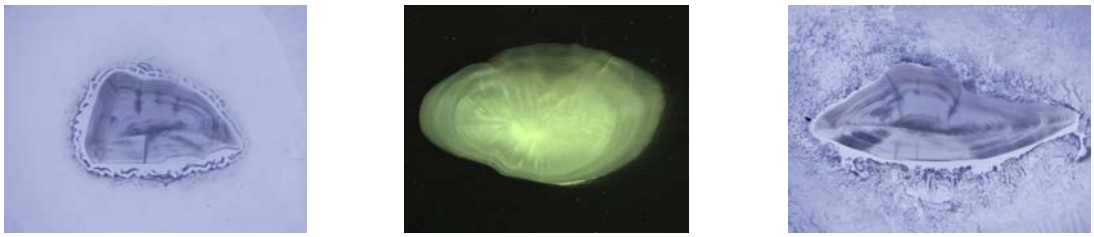


Fig. 14: Composition of stomach contents in a size range of small yellow croaker



Transverse section | Sagittal plane | Frontal section

Fig. 15: The three sections of the small yellow croaker otolith

42. Experts found no difference in the ageing results obtained using the different otolith sections used (Fig. 15). Only a small size range was obtained in the first survey (Table 2) and it was therefore impossible to discern if there was any difference in the growth rates in fishes located in either side of the Yellow Sea as was indicted in the data and information reports. It is hoped this may be resolved using catches from the final cruise.

Table 2: Size at age of small yellow croaker and Japanese anchovy from the 1st stock assessment surveys.

Species	Small yellow croaker (N=20)		Anchovy (N=20)	
Age	Standard length	Body weight	Fork length	Body weight
0	\	\	45mm-48mm	0.61g-0.75g
1	75mm-124mm	7.8g-29.8g	96mm-111mm	7.54g-13.12
2	154mm-168mm	72.4g-100.7g	\	\

3.1.2 Mariculture

43. The YSLME project organised a special half day session entitled “Reducing the environmental impacts of mariculture in the Yellow Sea” during the World Aquaculture Society (WAS) Conference in BEXCO, Busan City, Republic of Korea, May 2008. The conference was attended by more than a thousand people from 95 countries around the world. During the special session, participants presented papers on innovative methods of limiting the spread of disease causing pathogens,

decreasing the use of chemicals, and reducing the release of nutrients from mariculture establishments in the region. Talks covered heterotrophic shrimp culture, shellfish disease, dietary improvements, bioremediation using macro-algae and IMTA.

Fig. 16: YSLME booth at the World Aquaculture Conference

44. The YSLME manned a booth at the WAS trade show that ran in parallel to the conference (Figure 16). The booth displayed our latest publications e.g. The Yellow Sea: Analysis of environmental status and trends (China and R. Korea country reports, and regional synthesis) and various YSLME mariculture workshop proceedings as well as a poster display of the most recent activities in the project focusing on the development of the Strategic Action Programme and its impact on mariculture in the Yellow Sea. The Korean Aquaculture Society generously sponsored the booth.

45. The project also organised a Regional Mariculture Conference, hosted by Yellow Sea Fisheries Research Institute to continue the exchange of information on the recent progress on reducing environmental impacts of mariculture and maintain a sense of community amongst Yellow Sea mariculture researchers that had been fostered over the previous year. In addition, these regular meetings are thought to be an efficient method of enhancing regional mechanisms to prevent the spread of mariculture diseases. This follows the suggestions of participants of last year's symposium on "Aquaculture disease prevention, diagnosis and control".

46. The during the conference more than 30 scientists from Republic of Korea and China (Fig. 17) presented talks on 4 main themes: Environmentally friendly mariculture techniques; Reducing disease and use of drugs; Reducing the chemical control of pests; and Economic benefits of the sustainable mariculture.

Fig. 17: Participants of the Regional Mariculture Conference.

3.1.3 SAP demo activities - fisheries and mariculture

47. Three capture fisheries demonstration activities are being initiated to test their effectiveness.

48. Fishing boat buy-back is a common, but expensive method of reducing fishing pressure. This activity, performed by Pukyong National University, aims to demonstrate its effectiveness and evaluate whether it is being implemented efficiently in R. Korea. Researchers aim to assess changes in fishing pressure as a result of the Korean government reducing the capacity of the offshore fishing fleet by 30%. In addition, changes in catch composition and stock size will be estimated and awareness of the costs and benefits amongst fishers will be evaluated.

49. Stock enhancement through restocking and the use of closed fishing areas and seasons can be effective measures to rebuild fish stocks impacted by over-exploitation. The Yellow Sea Fisheries Research Station aims to test whether these measures can enhance fish stocks and contribute to more informed decision making with regard to restocking procedures. The effectiveness of the olive flounder restocking program will be evaluated in Liaoning province, using mark-recapture methods to assess survival and relative contribution of hatchery-raised individuals to the fish catch. Tag reporting/recovery rates will be checked through the purchase of entire fish catches from selected fishing boats.

50. The demonstration activity on the effectiveness of closed fishing areas/seasons will use the same fish catches to monitor the monthly change in composition of the fish landings before and after the closures occur. Historical records will also be accessed to examine the long term ecological impact of these closures on fish stocks and to estimate both the reduction in fishing pressure and the rebuilding of fish stocks. The findings from this study will be used to improve the efficiency of these closures and to educate local fishers.

51. Two mariculture demonstration activities are being implemented, IMTA and heterotrophic shrimp culture, to demonstrate their effectiveness in reducing the environmental impact of mariculture.

52. IMTA is where lower trophic level species such as algae and filter-feeding bivalves are used to absorb the waste products from higher trophic levels such as fish or shrimp thereby reducing nutrient outflows, as well as improving the overall

productivity and profitability. Working in Sanggou Bay, the YSFRI aims to promote the use of IMTA, by demonstrating the benefits in terms of increased production and profitability to the farmers; and the reduced environmental impact of IMTA compared with conventional monoculture practices to the provincial government (Figure 18).

Fig. 18: The integration of cage farming of fish with the culture of filter-feeding scallops and oysters, that remove particulates, and the nutrient absorbing seaweeds in Sanggou Bay.

53. Heterotrophic shrimp culture is a zero-water exchange system that uses low protein diets and aeration to promote the growth of bacterial flocks. These flocks absorb nutrients from the water and provide an extra source of protein for the shrimp, thus significantly reducing the release of nutrients to the environment and decreasing the need for fish protein in the diet thus reducing the demand for fishmeal. The bacterial community also significantly restricts the growth of disease causing bacteria, increasing the likely survival rate. The WSMRI aims to optimise the management of the system and demonstrate the increased profitability and productivity of this method (Figures 19-20). Particular attention is to be paid to local farmers that currently use flow thorough systems that discharge pond waste and chemicals directly into coastal waters.

Fig. 19: Heterotrophic shrimp culture in raceways in WSMRI.

Fig. 20: Clean, healthy, environmentally friendly produced shrimp from the raceways in WSMRI.

3.2 Biodiversity Component

3.2.1 Assessment of critical habitats

54. The Biodiversity National Data and Information Reports and the TDA recognized two major threats to biodiversity, that of habitat loss and decline in vulnerable and endemic species. This activity aimed to build on the work carried out by the WWF/KORDI/KEI Yellow Sea Ecoregion Planning Programme that identified potential priority areas using 122 indicator species in 6 taxonomic groups. As the

resulting potential priority areas occupied much of the coastal zone, experts were hired to further prioritise habitats that were critical not only for the preservation of endemic and vulnerable species but also biodiversity in general.

55. Scientists from the First Institute of Oceanography, China and Anyang University, R. Korea used a number of criteria (such as; size, degree of fragmentation, extent of human impact, biodiversity, number of vulnerable and endemic species) to identify the best example of each of the 10 types of Ramsar habitats found in the Yellow Sea.

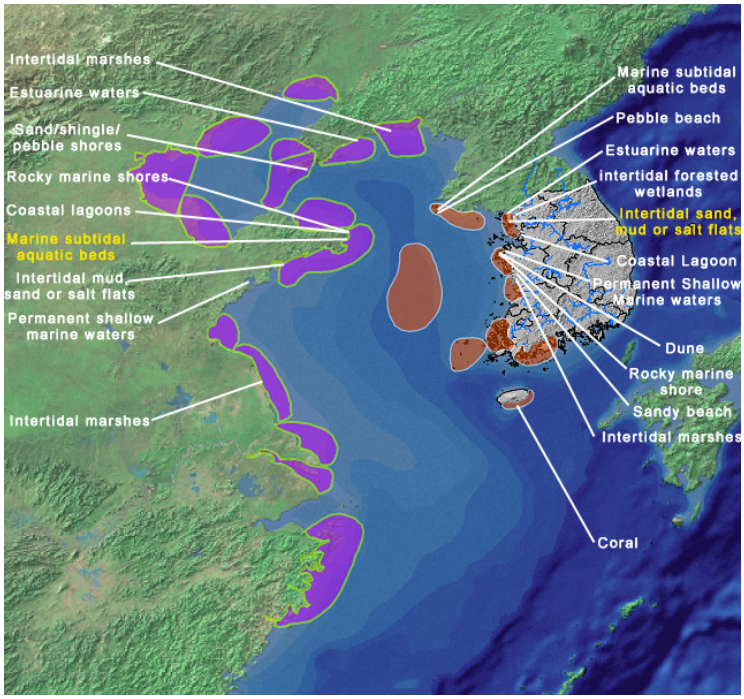


Fig. 21: The location of the representative Ramsar habitats and demonstration sites (in yellow), overlaid on the YSEPP map of potential priority areas

56. The resulting representative Ramsar habitats are shown in Fig. 21. The preservation of these representative habitats is crucial for the conservation of biodiversity. Each of these habitat types has their own unique assemblage of flora and fauna, and the future survival of these assemblages is therefore dependent on the conservation of these habitats. The results of these habitat studies were discussed in a meeting attended by YSESP and members of the RWG-Biodiversity. During the meeting 5 potential demonstration sites were also selected using the previously mentioned criteria. These included the tidal mudflats south of Ganghwa Island, Garolim Bay and the Han River estuary in ROK; in China the Roncheng sea grass beds and the Yalu River estuary wetlands were selected. These potential demonstration sites are currently being surveyed to obtain a baseline picture of the biodiversity that is present (Figures 22 & 23).

Fig. 23: Sampling in the Han River estuary

Fig. 23: The catch prior to sorting

3.2.2 Selection of demonstration sites

57. As reported below, management assessment of potential demonstration sites was completed by members of the YSESP project. These studies combined with the habitat assessment performed by the Biodiversity experts enabled the RWG-Biodiversity members to make an informed decision on which of the habitats was most suitable for demonstration activities.

58. The potential local partners for demonstration activities, the attitude of local government to conservation, current management effectiveness and potential developments plans, in concert with the habitat assessments, all contributed to the final selection of the Ganghwa southern tidal flat (Fig. 24) and Rongcheng seagrass beds (Fig. 25) as demonstration sites.

Fig. 24: Tidal mudflat south of Ganghwa island

Fig. 25: Seagrass beds in Roncheng, Shandong province

3.2.3 Shrimp genetic diversity

59. During the Genepool Workshop in May 2007, members agreed that the threats to genetic diversity were similar to those threatening biological diversity in general. These threats included habitat loss, over-exploitation and habitat degradation from pollutants and eutrophication. However, restocking of wild populations using hatchery-reared juveniles and introduction of non-native species from ballast water and for aquaculture were regarded as specific threats to genetic diversity in the Yellow Sea. To understand the impacts of restocking and the possible management implications, the Institute of Oceanography, Chinese Academy of Sciences examined the historical records of the genetics of wild stocks of the Chinese fleshy shrimp.

Initial results, using two different methods, suggested that there was a slight decrease in genetic diversity between 1995 and 2001. In contrast, analysis of the current genetic diversity in stocks from around the Yellow Sea, suggested that between 2004 and 2008 no loss of diversity was apparent.

60. However, improved brood stock management is required as some worrying traits are appearing. Certain genetic profiles are now found only in the cultured stock, and a previous study suggested that a hatchery raised stock in Dalian had higher diversity than wild stocks. If these are traits introduced into the wild stocks, the overall genetic fitness could decrease. The final report will propose a number management actions to improve restocking practices. These recommendations are thought to be generally applicable to all restocking activities in the Yellow Sea.

3.3 Ecosystem Component

3.3.1 Ocean colour algorithm

61. This activity extended to a 2nd phase this year in order to improve the common dataset and the in-water algorithms for estimating chl-a, TSM, and CDOM ag440 (Figure 26). For this year, the activity focuses on the following:

- Error analyses of outlier points;
- Additional match-up generation for the turbid water;
- Examine the influence of geographically biased distribution of match-ups;
- Develop satisfaction criteria for the final algorithms;
- Design new approach for improving the in-water algorithms (i.e., using ratios, case separation, etc.); and
- Inviting atmospheric correction scientists to contribute to the final outputs.

62. A planning workshop was held in Kota Kinabalu, Malaysia, 22nd May 2008, in conjunction with 7th WESTPAC Scientific Symposium, where the above objectives were agreed on (Figure 27). A final meeting will be held in December to finalise the regional algorithms.

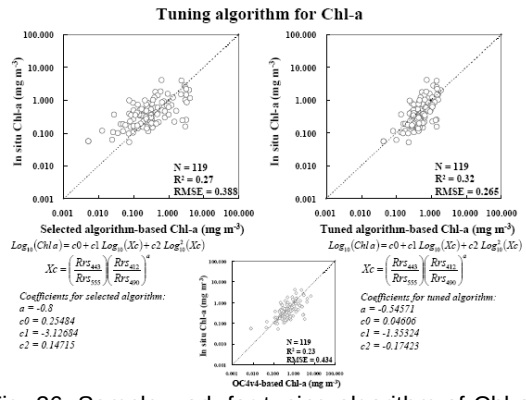


Fig. 26. Sample work for tuning algorithm of Chl-a (left).

Fig. 27. Participants of the YOC-2008 First Meeting (right).

3.3.2 Primary productivity estimation

63. The activity aims to:

- develop regional primary production algorithm that can be used for long-term monitoring;

- provide a baseline assessment of potential productivity of the Yellow Sea; and
- generate field bio-optic data to assist the development of chlorophyll algorithms.

64. *In-situ* observations have been carried out in Ganghwa and Taean, using the FRRF to measure bio-optics and photosynthetic parameters. Due to numerous malfunctioning of the FRRF, preventing field surveys to be carried out earlier this year, the activity has been extended to end next February. At that time, annual primary productivity maps and inter-annual variability of primary productivity in the Yellow Sea will be presented.

3.3.3 SAP demo activities - ecosystem

65. Three SAP demonstration activities have been initiated under the Ecosystem Component:

- Monitoring Jellyfish Bloom in the Yellow Sea;
- Assessing impacts of N:P:Si change on the Yellow Sea ecosystem; and
- Assessing and Monitoring the Impacts of Climate Change on the Yellow Sea's Ecosystem.

66. The monitoring of jellyfish has completed some field surveys using visual counting, as well as acoustic surveys (Fig. 28). So far, not so many jellyfish have been detected, compared to previous years. An underwater camera and its support system were made and tested in the field along with the visual counting and acoustic methods. However, due to the absence of giant jellyfish, the camera could not capture any results. Nevertheless, the performance of the camera proved that the system can visualise bubbles at the sea surface.

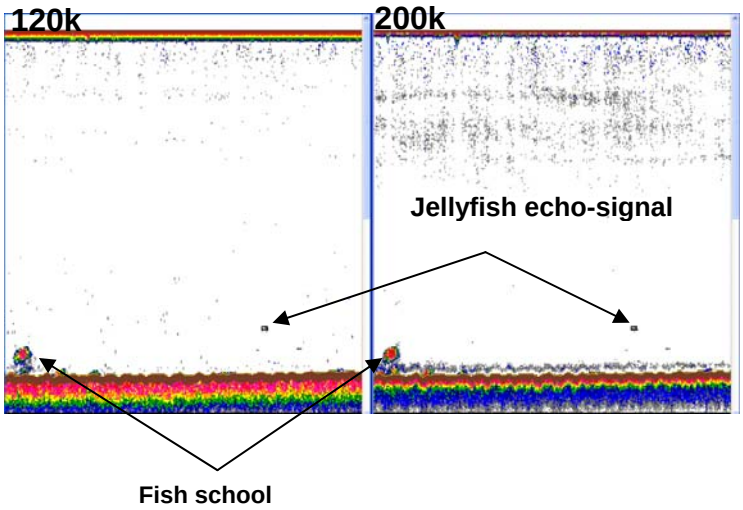


Fig 28. Jellyfish detected by echosounder in August 2008 (from Dr. Yoon Won Duk).

67. The activities on assessing changes in N:P:Si and climate change impacts have only just begun. The N:P:Si activity is investigating effects of nutrient ratio changes and response of phytoplankton and zooplankton. Results from the co-operative cruise will contribute to the activity, as well as historical data, and lab and mesocosm experiments. Expected outputs next year are showing that ratios did change, giving some examples of impacts of ratio change on the ecosystem and suggesting to policy makers and scientists the best monitoring strategy to use.

68. The activity to investigate effects of climate change on phytoplankton will compare historical data of physical & biological characteristics, and modelling to understand environmental changes and population dynamics of *Calanus sinicus*, as there is ample historical information on this species. Climate-related data have been collected, and change in phytoplankton over past decades analysed. Enrichment experiments on dust storm effects will be carried out, and *C. sinicus* historical data collected. This activity will propose regional guidelines on monitoring.

3.4 Pollution Component

3.4.1 Capacity building

69. Three capacity building activities were implemented for analyses of nutrients, inorganics and organics. This activity built upon the early rounds of inter-calibration exercises (see 3.4.2) held during 2006-2007. The purpose was to increase analytical ability and understanding of good practices in the process of sampling procedures, standard operation procedures, analysis, and QA/QC.

70. A group of 4 young scientists from the region visited FSS Queensland for nutrients analysis. This group was exposed to the full range of procedures starting with a field trip to Oxley Creek to demonstrate a range of sampling procedures and techniques, including the application of appropriate and relevant QA/QC procedures (incorporating field blanks, use of CRM's as sample unknowns, repeatability, reproducibility). An interesting exercise was the "finger test" whose result will show the contamination from the sampler's hands if samples are collected incorrectly (Figure 29). Laboratory work included total nutrient analyses and soluble analyses of samples applying a range of appropriate laboratory QA/QC's under the demonstration of experts of FSS. The analyses of total nutrients were carried out using various automatic auto-analysers. Finally, participants reviewed and evaluated all of the samples. As well as reviewing the sample results, QA/QC aspects such as the preparation of control charts, development and calculation of precision criteria e.g. repeatability, reproducibility, accuracy and acceptance criteria, were applied to the final analyses.

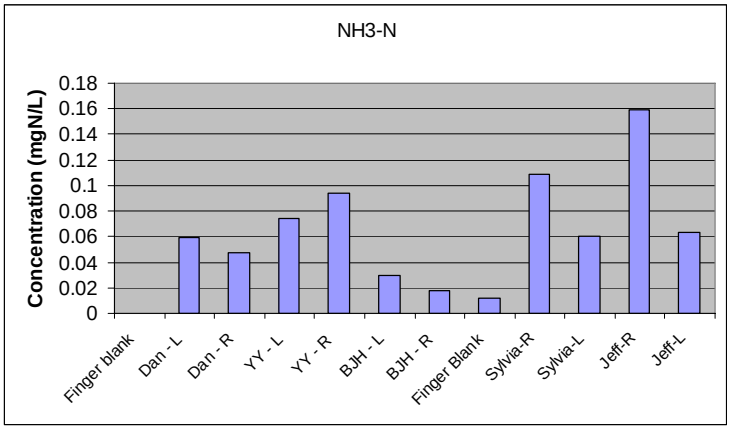


Fig. 29: Results of the finger test (from Ms. Yang Ying).

71. Two groups of scientists concurrently visited IAEA-MEL for capacity building in inorganic and organic analyses (Figure 30). Training was given in analyses of organic compounds and PCBs in sediment and biota samples. Similar to the nutrients capacity building, these 2 groups were also informed about good practices in sampling, sample treatment, analysis, and reporting. Discussions were also held on HAB, HAB toxins and their detection, PSP toxins, and speciation analyses of trace metals.

72. Participants from all 3 groups reported that they learned a lot from the visit and each could apply various items to their research work. All hoped that future analytical results would be more accurate and reliable upon applying the newly acquired skills.

Fig. 30: Participants and trainers at IAEA-MEL.

3.4.2 Data quality assurance - Inter-calibration exercises (nutrients, metals, organics)

73. Inter-calibration exercises continued with the 3rd round of nutrients analysis in seawater and 2nd round of inorganics and organics analyses. These exercises are on-going, with results expected at the end of the year or early next year. FSS continues to co-ordinate the nutrients exercise, while IAEA-MEL continues with the other 2 exercises. This exercise is not without some challenges, as many labs do not return results on time. While past results show that most results are within the acceptable range, results are not the only determining factor in such exercises. All participants should adhere to the rules, an important one which is carrying out the analyses within the agreed time frame.

3.4.3 Assessment workshops

74. A workshop on assessing marine pollution was convened in Shenyang, China, 2-4 June 2008, co-hosted by NMEMC and the Liaoning Oceanic and Fisheries Bureau. More than 20 scientists from China, ROK, United Kingdom, NOWPAP, and YSLME presented a wide range of monitoring and assessment work being carried out in the Yellow Sea. Suggestions on the objectives of monitoring and how to incorporate methods from outside the region were also provided. The discussion session allowed exchange of information, and noted some salient points to improve monitoring and assessing the data in this region. Participants also took the opportunity to expand their network to include scientists from other regions and institutes within the larger northeast Asian region. A CD containing the abstracts and presentations is available.

75. A member of the PMO participated in NOWPAP's 2nd Coastal Environmental Assessment Workshop, Toyama, Japan, 11 September 2008, and gave a presentation on the various kinds on assessment the project is undertaking. Besides technical assessment, such as modeling and prediction, mention was given to economic assessments that the project is undertaking, such as cost-benefit analysis and other economic tools that can be used to assess management actions.

3.4.4 SAP demo activities - pollution

76. Four SAP demonstration activities have been initiated under the Pollution Component:

- Management of recreational waters;
- Monitoring and assessing atmospheric deposition of pollutants;
- Calculation of nutrient loads in hot spot areas; and
- Monitoring and assessing sea-based sources of nutrients.

77. All activities are being implemented in Shandong and Liaoning coastal areas (Figure 31). Management of recreational waters is taking place in the Qingdao bathing beaches where information on faecal coliform, *Enteromorpha,* marine litter, and jellyfish are being collected. Although a current marine litter monitoring programme is already in place, this activity will investigate whether the programme should be revised to be more relevant to the needs of monitoring water quality of recreational waters.

Fig. 31: The selected study areas are located in Qingdao coastal waters.

78. The atmospheric deposition activity will calculate the amount of contaminants, evaluate major sources of PAHs, and evaluate atmospheric contribution to the overall trace metal and nutrients input in the northern Yellow Sea. Island sampling sites will be compared with polluted land areas to determine if pollution is from land or sea (Figure 32). The consultant for the activity will compare and share his data with ROK scientists who have similar information, thus, extending the on going co-operation of the pollution scientists in the region.

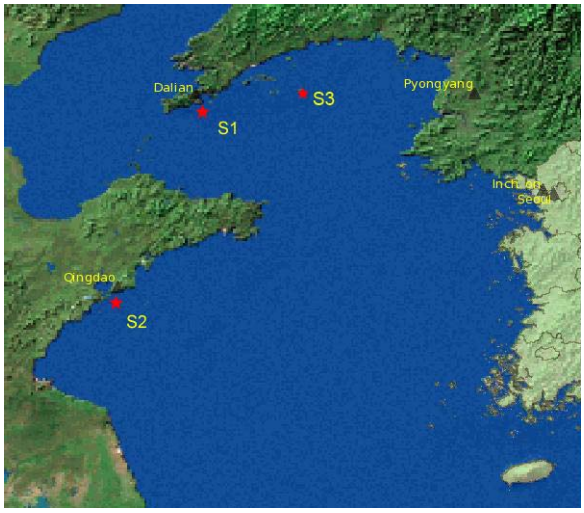


Fig. 32: Three monitoring sites at Laohutan Station (S1), Xiaomai Island (S2), and Changshan Island (S3).

79. The calculation of nutrient loading in hot spot will be implemented in the Yalu River basin, estuary, and coastal area of Dandong City (Figure 33). This site suffers from nutrients and oil as the main pollutants, with frequent HAB occurrences. The activity

will examine pollutants from land- and sea-based sources, identify major nutrient sources, and use models to estimate total loading.

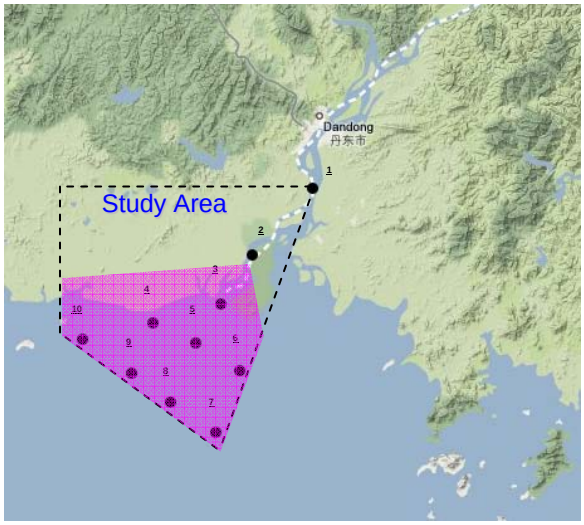


Fig. 33: Map of Yalu Estuary and the monitoring area/stations.

80. The fourth demo activity is also taking place in Liaoning Province (Figure 33). Surveys of mariculture ponds and bays in Qingduizi, near Yalu Estuary have been carried out. The early surveys showed that nutrients were higher in the ponds than in the bay (Fig. 34). Community structure and phytoplankton diversity in the bay have also been investigated. Future work will include additional surveys and transfer of knowledge for policy making.

Fig. 33: Mariculture ponds in Qingduizi Bay (from Liaoning Ocean and Fisheries Science Research Institute).

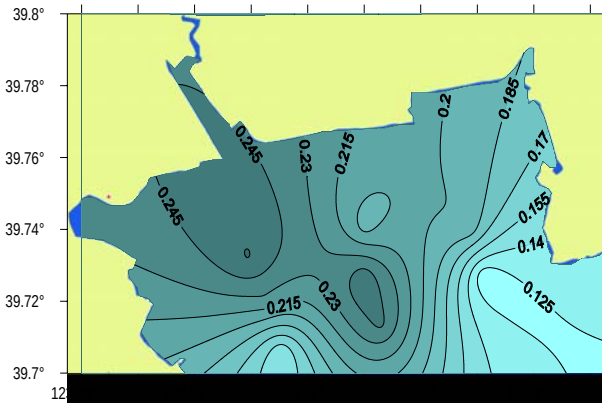


Fig. 34: Inorganic nitrogen in seawater in August 2008.

3.5 Investment Component

3.5.1 Yellow Sea Partnership

81. The YSP logo has been designed and accepted by members (Figure 35).

82. The third YSP Workshop was organised in Changwon, ROK, on 2 November 2008 in conjunction with the meeting of Ramsar Convention. Birds Korea, a member of the YSP, hosted the Workshop.

83. After presentations of current conservation activities by participating organisations, the meeting discussed effective co-operation under the YSP with emphasis on the following four issues: (i) bridging policy and science; (ii) specific areas or projects to

collaborate; (iii) practical steps for sustainable management of the YSP, including the preparation and implementation of the next workshop; and (iv) barriers and opportunities for co-operative efforts.

84. As a result of the intensive discussion, the meeting produced a number of suggestions to facilitate and enhance collaboration under the YSP. The meeting decided to organise the fourth workshop next year in China, acknowledging the importance of exchanging information and opinions through face-to-face communication.

Fig. 35: A logo of the Yellow Sea Partnership (designed by WWF, modified/adopted by the 2nd YSP workshop).

3.5.2 Youth Programme

85. The third Youth Programme was organised in Buan, ROK, from 19 to 21 August 2008 in co-operation with a number of organisations, including Buan Municipal Government, Korea Marine Rescue Center, KORDI, NOWPAP, China Ocean News, and the Sea Explorers of Korea (Figure 36).

86. Twenty middle/high-school students attended the Programme from the Yellow Sea's coastal provinces and cities: ten students from China and ten students from ROK. Professional scholars with expertise in marine ecosystem as well as officials at local government and international organisations were invited as lecturers.

87. The Programme (a 3-day activity consisting of classroom lectures, field activities, and group work) provided the students with an opportunity to understand the importance of the Yellow Sea and to observe and experience its ecosystem.

88. Through the Programme, the students achieved a better understanding of the Yellow Sea, and were encouraged to actively think and act for conservation. The students also nurtured a friendship with each other by sharing and exchanging views and opinions about marine environment conservation.

Fig. 36: Youth Programme organised with participants from China and ROK.

3.5.3 World Ocean Week

89. For World Ocean Day (8 June 2008), the Project organised drawing and photo competitions to raise public awareness of the importance of the Yellow Sea. (The World Ocean Day was proposed during the Earth Summit in Rio in 1992 to raise awareness of the need to manage the oceans and their resources in a good manner.)

90. More than 400 people, including elementary school students from China and ROK, participated in the competitions (Figure 37). Some selected pieces of work are available online at the Project's website.

Fig. 37: Pictures drawn by school children for World Ocean Day.

3.5.4 Voluntary Internship Programme and Model UN

91. As part of co-operative activities agreed in the Memorandum of Understanding with the Division of International Studies of Korea University, the Project co-hosted the Korea Model United Nations in Seoul, ROK on 14 February 2008 (Figure 38).

92. More than a hundred university students as well as high-school students participated in this simulation of the U.N. General Assembly, the U.N. Security Council, and other relevant bodies to broaden knowledge of various issues that the world faced and to exercise and improve diplomatic and negotiation skills required for debates.

93. Subsequently, twenty students from the University visited the PMO on 16 May 2008 to obtain a better understanding of the Project's activities. After the presentation by the PMO, the students exchanged their views and opinions with Project Manager and his staff members on the marine environmental issues as well as the role of the United Nations.

Fig. 38: Model United Nations co-organised with Korea University.

3.5.5 Associate Experts

94. The Project invited two Chinese government officers to this year's "Associate Expert Programme" to provide them with an opportunity to become familiar with the operational procedures of United Nations' international projects.

95. The Associate Experts, nominated by NPC for China, assisted the PMO in implementing various activities, including meeting preparation and public awareness activities. An intern with training in environmental economics, invited from SOA, started her three-month internship in September 2008 (Figure 39). Another intern is expected to start the Programme in late 2008/early 2009.

96. There was no appropriate candidate identified from ROK, although the position was advertised three times in 2008. Therefore, the Project decided to have no Associate Expert from ROK this year. The decision was informed to the NPC for ROK in July 2008.


Fig. 39: Ms. Jing Li, Associate Expert (second from left), attending the 5th RWG-E Meeting.

3.5.6 Small Grants Programme

97. Six projects, funded by the Small Grants Programme 2006, were completed successfully, and the Programme Report summarising those projects was published (available online at http://www.yslme.org/publication.htm) (Figure 40).

98. Five projects funded by the Programme 2007 were implemented as scheduled; three projects were completed already, that were conducted individually by the Korea Marine Rescue Center, the Liaoning Ocean and Fishery Department, and the Rongcheng Fisheries Association, Shandong Province.

99. Following the successful implementation of the Programme in the past two years, the Project decided to fund five projects under the Programme in 2008 as suggested by the RWG-I and agreed by the PSC.

100. The five grantees, selected from 14 submitted proposals by the External Review Panel, consisted of local environmental NGOs, local fisheries association, and universities (Table 3). It is worth noting that the quality of this year's proposals was high; there was a clear sign of the improvement in composing proposals during the last couple years of Programme implementation.

Project Title	Proponent
Resource Reliance of Surrounding Communities' Economy on Binzhou Shell Dyke Island and Wetland National Natural Reserve and Their Participations in the Management of the Reserve	School of Economics, Ocean University of China
Establishing preliminary guidelines, processes and basic designs for the enhancement, restoration and "Wise Use" of the "Mokpo Urban Wetland"	Birds Korea
Protecting the seagrass beds for a better future	Rongcheng Fisheries Association
Ecological pre-warning assessment on environmental quality in the core area in Yancheng Biosphere Reserve: heavy metal pollution status of macrobenthos caused by economic development in recent years	Nanjing University
Living with black-faced spoonbill, the symbol of peace in the Yellow Sea	PGA Wetlands Ecology Institute

Table 3: Projects selected for Small Grants Programme 2008.

Fig. 40: The cover of Small Grants Programme 2006 (publication).

3.5.7 Data and information management

101. The Project established the Regional GIS and Meta Databases in 2006 at the CKJORC. The CKJORC provided the Project with necessary consulting services to develop, operate, and maintain the databases.

102. Under the contract made in 2008 with the Project, CKJORC improved the databases by updating existing data and information, by strengthening the network with other relevant databases, and by enhancing the interface/functions of the databases to allow easy retrieval and presentation of data (Figure 41).

103. Following the agreement made by the 4th RWG-I Meeting, CKJORC also organised the Technical Workshop on Regional GIS Databases (Qingdao, China, 23-24 August 2008) as the Project's activity to create ideas and solutions to enhance the information services provided by the databases. The participants consisted of regional experts from relevant organisations, including NOWPAP.

104. RWG-I suggested developing the mirror site during the Project's second phase when more data and information are available (Document, UNDP/GEF/YS/RWG-I.5/3).

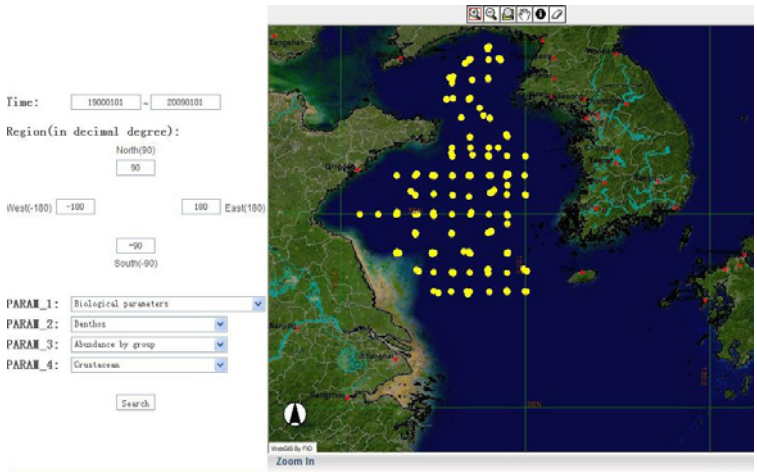


Fig. 41: GIS map with data query function provided by Regional Databases.

3.5.8 CBA of mariculture and other SAP demo activities

105. The Project will initiate CBA of some SAP demonstration activities such as the activity for improving sustainable mariculture techniques. ("Guideline for Economic Analyses of Environmental Management Actions for the Yellow Sea," published in 2008, will be used a reference for the CBA work.)

106. The objectives of the analyses are to assess the cost-benefit performance of the activities and to show how economic analyses can be used for better ecosystem management as one kind of decision-support tool. Specifically, the study is expected to:

- Suggest recommendations on whether and how the demonstrated activities should be implemented on a widespread basis with their economic aspects considered;
- Provide governments with guidelines on how the CBA method should be used for better ecosystem management; and
- Provide a suggestion to integrate economic analyses into the workplan of relevant authorities to assist them in designing and implementing their conservation activities.

107. The CBA works, to be completed by Summer/Fall 2009, will be conducted in close co-operation with the organisations/individuals who implement the concerned demonstration/pilot activities.

3.6 National co-ordination and implementation

108. National co-ordination has been largely strengthened during the reporting period, which is one of the major achievements of the project. The following facts demonstrated effective national co-ordination:

- Agreement on the co-operative cruise was reached with compromise proposed by the governments of the participating countries, following more than 2 years of negotiations. The cruises were finally organised in winter and summer of 2008 with substantive outcomes in data and samples collection.

- During the preparation of the SAP for the Yellow Sea, it was agreed at the Special Meeting of PSC that a YSLME Commission should be established as the co-ordinating mechanism for protection of the marine environment in the Yellow Sea. The main tasks of the Commission will be co-ordination of the national and regional efforts in implementing the SAP. It was agreed in principle that DPRK would join the Commission to allow full co-ordination and collaboration among all the coastal countries in the Yellow Sea.

- Under the effective co-ordination of the Inter-ministry Co-ordinating Committee, the preparation of the NSAPs has been implemented smoothly, which largely contributed to the more effective national co-ordination in the region.

3.7 Cross Component Issues - SAP cross component demonstration activity

109. A biodiversity-pollution cross component SAP demo activity recently got underway in Ganghwa tidal flats, ROK, to show how regular monitoring and assessment of the ecosystem and exchange of information across different responsible agencies can help improve the marine habitats through controlling marine pollution in the Yellow Sea (Figure 42). Estimation of pollution loading, types of pollutants, current status of pollution, information exchange, establishment of monitoring programme and management plans, and benthic microcosm study will be carried out to identify the relationship between pollution and biodiversity. Through these activities, it is hoped that the proposed biodiversity habitat management can be applied to other biodiversity studies in the Yellow Sea region.

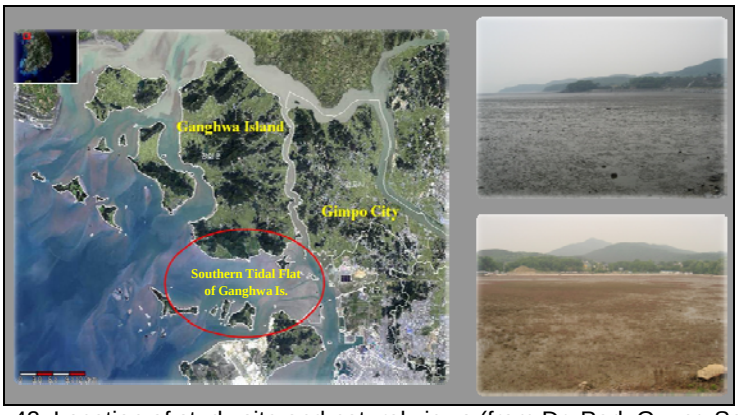


Fig. 42: Location of study site and natural views (from Dr. Park Gyung Soo).

4 FINANCIAL REPORT 2008

110. This year, China and ROK provided additional co-financing. SOA North Sea Branch contributed USD 100,000 to the summer co-operative cruise, while ROK has committed USD 120,000 for capacity building and NSAP preparation.

111. The expenditure report is attached as Annex II.

5 REPORT ON THE PROJECT MANAGEMENT OFFICE

5.1 Facilities and Office Operation

112. With continuous support from KORDI, the PMO office has run smoothly this year with adequate office space. The location of the Secretariat remains in place for the remainder of the project, as there is adequate space to comfortably accommodate 2 additional staff, usually, Associate Experts.

113. Since March, PMO began operating the UNOPS Atlas financial system instead of using the Imprest account. Having access to Atlas helps to ensure that all transactions recorded in the project accounts are accurate and in accordance with UNOPS Financial Rules and Regulations and other relevant procedures. Working directly through Atlas also enables the project to track all contract payments and comply with other budget-related issues.

114. The PMO continues to operate within UNOPS' rules and regulations.

115. Ms. Euidea YUN, IT staff, was on maternity leave for 4 months during the beginning of the year. A temporary IT staff, Mr. Wooyeol BAEK, was hired to oversee all IT functions during this period. Mr. Baek ensured that all IT functions continued to be met, and also helped with publications and designing an online calendar which all staff could access anywhere internet connection was available.

116. The Inventory Report listing the PMO's assets is attached as Annex III.

5.2 Project Website, Partnership Website, and Newsletter

Google API

117. After four years of operation, the project website, www.yslme.org, keeps the aim of "information dissemination" which is fully sufficient and works as a linkage among the UNDP/GEF Yellow Sea members. It disseminates background information about the project, the staff and partners, the latest news on implementation, project reports and meeting documents, and relevant stories about the Yellow Sea.

118. Additionally, the Google Earth API (Application Programmable Interface) was established and is accessible from the project website with multi plug-ins based on MS Internet Explorer (Figure 43). It provides visual effects for the Yellow Sea area with scientific data, and can explore the region and other parts of the world. The site has default functions like Status Bar, Navigation Control, Grid, Overview Map, Scale Legend, Atmosphere, Mouse Navigation. Zooplankton biomass (mg/m^3) calculated with wet weight in 2000 and abundance (inds./m^3) of four zooplankton assemblages in 2000 (inds./ m^3) in the surface of Yellow Sea is one layer which can be navigated. In later stages, this site will provide more layers of data. Without needing professional GIS tools, the Google Earth API allows users to access geographical information.

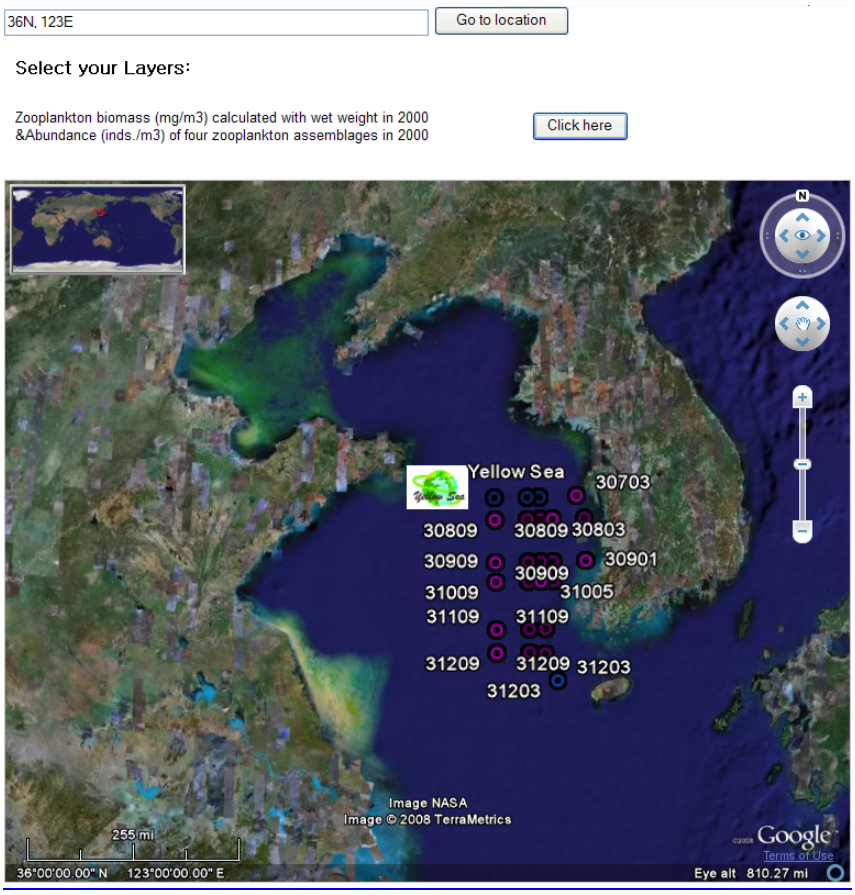


Fig. 43: Google API showing example of zooplankton data.

Partnership Website (Figure 44)

119. The website helps to promote environmentally-sustainable management and use of the marine and coastal resources in the Yellow Sea for the Yellow Sea Partners. The platform takes advantage of the free tools and services offered and supported by

UNEP/GEF IW:LEARN website toolkit. With the toolkit, each partner may update its news by itself, directly to the website.

Fig. 44: The YSP website.

Newsletters

120. The full set of newsletters from 2005 is accessible from the project website. The newsletters describe all past events, workshops, and activities implemented by the project (Figure 45). The PMO continues to seek better ways to communicate with the public and transmit information. Suggestions in this regard are welcome.

Vol.4 No.1

Vol.4 No.2

Vol.4 No.3 Vol.4 No.4

Fig. 45: Newsletters issued in 2008.

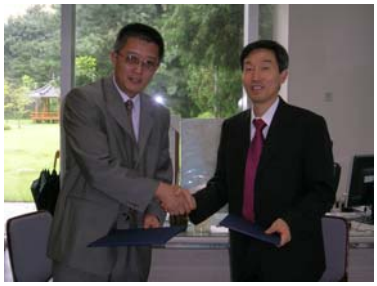
6 CO-OPERATION WITH OTHER ORGANISATIONS AND PROJECTS

6.1 Exchange of Memorandum on Co-operation

121. The project continued efforts to establish and strengthen co-operation with additional organisations. In 2008, the project exchanged MOUs with the following organisations:

- Law School, Ocean University of China (30 June 2008);
- KORDI (13 August 2008); and
- Ministry of Land, Transport and Maritime Affairs, ROK (18 August 2008) (Figure 46).

122. The MoUs stated the scope and formats of the co-operation, specifiying activities and focal areas to collaborate on. Namely, the MoU with MLTM aimed to enhance the co-operation to promote the preparation of NSAP for ROK and to build and enhance the capacity of all stakeholders around the Yellow Sea. In line with the agreement with the MLTM, the MoU with KORDI focused on the co-operation in organising the TDA/SAP capacity building workshop and the Project's phase 2 working group. The MoU with Ocean University defined a comprehensive agreement to facilitate information-sharing and exchange by strengthening the partnership with the University and expanding the network with other universities.



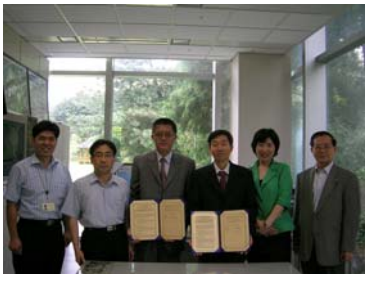


Fig. 46: Left photo: Mr. Yihang Jiang, Project Manager (left) exchanged the MoU with Mr. Won-Min Kim, Director General, MLTM, ROK (right).
Right photo: The MoU signing ceremony.

6.2 Co-operation with NOWPAP in Marine Litter Issues

123. The Project furthered co-operation with NOWPAP in various areas, particularly marine litter issues. Representatives of the Project attended two ICC campaigns organised by NOWPAP in September 2009 in Dalian, China and Vladivostok, Russia.

124. During the ICC Dalian, Mr. Quan Wen, Chairperson of Project's RWG for Pollution Component, presented management actions that were proposed by the SAP to address marine litter in the Yellow Sea, explaining a demonstration activity focusing on management of recreational waters. Mr. Sungjun Park, PMO Staff Member, reported to the ICC Vladivostok on the progress of Project's public awareness activities with respect to marine litter issues (Figure 47).

125. The Project will seek further co-operation with NOWPAP as well as other relevant organisations to solve marine litter problems in the Yellow Sea, while the Project conducts management actions as part of the SAP implementation. It is expected that such a co-operation will help in making regional conservation efforts more efficient and effective.

Fig. 47: Mr. Sungjun Park giving his talk at the ICC Vladivostok.

6.3 Synergy with WWF on Selection of Demonstration Projects and Small Grants

126. Following the MoU between the WWF/KORDI Yellow Sea Ecoregion Support Project and the YSLME project we coordinated the work plans and activity schedules of the both projects to maximise the use of resources by promoting complementary activities. WWF provided advice and support for many project activities including helping develop the SAP biodiversity management actions and attending the 5th RWG-Biodiversity meeting and Yellow Sea Partnership meeting.

127. The two projects worked together closely to select the potential biodiversity demonstration sites at a meeting with other parties in June 2008, and both project contributed data. The YSLME project concentrated on assessing the biological/physical aspects of these representative habitats, while the YSESP project assessed the management effectiveness and threats in these critical habitats. Both projects will use the information to select their sites where management actions from our jointly developed SAP will demonstrated.

128. The projects further co-operated acting as reviewers of proposals received for each others small grant programmes. This close cooperation has been instrumental in advancing both projects agendas for biodiversity conservation and greatly enhances our cost effectiveness.

6.4 Wetland Meeting with Other UNDP/GEF Funded Projects and Ramsar Convention

129. The project recently co-organised an "International Symposium on East Asian Coastal Wetlands" with the Getbol Forum, Birdlife International, the Common Wadden Sea Secretariat, and the Tidal Flat Research Center and was hosted by the MLTM (Figure 48). The Symposium was held immediately prior to the Ramsar COP 10 meeting in Changwon and attracted speakers from around the world. The conclusions from the symposium on the importance of recognizing the value of wetlands in terms of the ecosystem services they provide to the coastal population and the need to conserve them, were adopted as an annex to Resolution 22 of the Ramsar COP 10.

130. During the Ramsar COP 10 the project operated a booth in the convention centre, informing delegates and observers on the environmental challenges in the Yellow Sea and the project activities to remedy them (Figure 49).

Fig. 48: The International Symposium on East Asian Coastal Wetlands

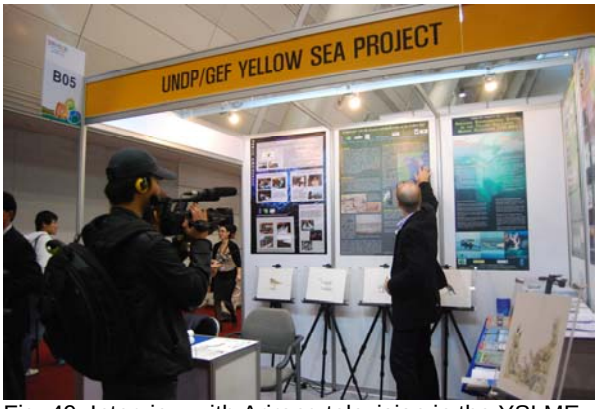


Fig. 49: Interview with Arirang television in the YSLME booth at the Ramsar COP 10

6.5 Collaboration with MLTM, KORDI, NMEMC on DPRK Activities

131. Section 2.7 already mentioned the project activities in which DPRK participated during the year. Through collaboration with MLTM, KORDI, and NMEMC, various MoUs were signed in order to engage DPRK in each of these activities. Funding from MLTM, KORDI, and China have enabled these activities to be realised. The project is grateful for these external resources that have allowed DPRK to be updated on the project's development. Discussions continue among all parties to examine additional activities that might be required or necessary in order for the region to have a more common starting point when implementing the SAP in the near future.

7 CHALLENGES TO PROJECT IMPLEMENTATION

132. Although the project has been running for four years, challenges to implementation still remain. To ensure successful project implementation in the remaining year and a half, it is critical that all challenges are addressed now. The RSTP and PSC are requested to pay attention to these challenges, to take action to eliminate them, or at least lessen their negative impacts. The challenges to project implementation are listed in Table 4.

Issue	Situation
Enhance the participation and roles of the IMCC	The IMCCs have been established in both countries with regular meetings. However, participation from a wide range of government agencies is still weak. This needs to be strengthened, especially since there is a possibility of SAP implementation.
Lack of a wide range of stakeholder, such as NGO, participation in decision making processes	Since project inception, the membership of only NWGs and RWGs has included slightly more institutions. However, new member involvement in the overall project was limited in scope and number and only on a short-term basis (Small Grants Programme). Considering the future of the project, it would be more effective and beneficial to the region if additional institutions, especially NGOs, have long-term involvement in the project that is not limited to technical issues. It should be noted that allowing long-term participation in more institutions from relevant stakeholders would bring more expertise and human resources to the project, and also help raise attention on the environmental problems faced by the Yellow Sea.
Unstable NWG and RWG membership	The members of some Regional Working Groups continue with membership changes. While the RWGs will not have its own meetings anymore, consistent membership is still required in order to see all activities until the end of the project. Stable membership will enable the group to understand the activities, and provide appropriate guidance.
Lack of institutional incentives	This issue has not been solved, and is related to the above. While recognition of the issue has been heightened, there still is no resolution to the situation. Considering that co-financing from all countries is required for the project's future, this issue warrants further discussion and solution.
Little regard for previously agreed deadlines and attention to reminders	There continues to be delays in meeting milestones stated in legally signed contracts for activities, although this has improved compared to the first year of the project. Contracted parties need to maintain a sense of urgency in order to maintain efficient project implementation, especially given the limited time of the rest of the project.

Table 4. Challenges to project implementation.

133. Although challenges remain in project implementation, there has been considerable progress since the early years. Some issues still remain, but most are considered low-risk, as the majority of the project's players are now aware of the issues that might derail efficient project implementation, and have made amends to limit such incidences from occurring. As the project moves towards implementation of the SAP, the remaining challenges serve as a reminder that there is still a need for a continued sense of commitment by all parties to the project and a faithful and optimistic outlook that the project, with an SAP in place, will provide the expected benefits to the region's marine environment and any future benefits the project may bring.

134. Recommendations to overcome the challenges are described in Section 8.

8 RECOMMENDATIONS FOR FUTURE IMPLEMENTATION

135. Following the implementation of the project activities since the last PSC meeting, the PMO would like to make the following recommendations for the consideration of the PSC:

(i) Regional and national co-operation and co-ordination have contributed largely to the successful implementation of the project. Therefore, it is recommended that the regional and national co-ordination and co-ordination should be further strengthened. In particular the role of IMCC should be strengthened.

(ii) The SAP for the Yellow Sea has been prepared with close consultation with the experts from the participating countries. Necessary actions have been taken to introduce the SAP to the governmental officers and experts of DPR Korea. It is recommended that all the stakeholders of the project take all necessary action to ensure the final endorsement of SAP, and consider relevant matters in implementing SAP.

(iii) Considering the importance to keep the momentum obtained from the project, and ensure effective implementation of SAP, the PSC instructed the PMO to start preparation of necessary documents for the 2nd phase of the project. It is recommended that the participating countries should positively consider the proposed actions in the draft PIF, including establishment of YSLME Commission and contribution of national co-financing resources for implementing the management actions proposed by the SAP.

(iv) It is important to involve all the coastal countries of the Yellow Sea in the project implementation. It is recommended that the all partners of the project positively consider the issue of full Involvement of DPR Korea in the project.

Annex I

Activities and Workshops Convened by the Project in 2008

5-9 Jan	SAP Drafting Group 1, Yantai, China
12 Jan	Co-operative Cruises Launching Ceremony, Qingdao, China
21-22 Jan	Ocean Colour 3 Workshop, Sendai, Japan
14-16 Feb	Model UN with Korea University, Seoul, ROK
13-15 Mar	SAP Drafting Group 2, Yoo Sung, ROK
17-21 Mar	YSLME-KORDI-NMEMC Workshop on Capacity Building for Environmental Pollution Monitoring and Assessment, Dalian, China
14-16 Apr	1st Fisheries Stock Assessment, Qingdao, China
6-7 May	3rd Ad-hoc Working Group for SAP, Hangzhou, China
8 May	2nd Special PSC Meeting, Hangzhou, China
19-23 May	World Aquaculture Society Conference, Busan, ROK
2-4 June	Marine Environmental Assessment Workshop, Shenyang, China
10-12 June	5th Technical Meeting for Co-operative Cruises, Yantai, China
19-21 Aug	International Youth Programme, Buan, ROK
19-21 Aug	2nd Fisheries Stock Assessment, Incheon, ROK
21-22 Aug	Introduction of TDA/SAP, Dalian, China
23-24 Aug	GIS Technical Workshop, Qingdao, China
26-28 Aug	1st Phase 2 Working Group, Dalian, China
2-4 Sep	5th RWG-Biodiversity Meeting, Weihai, China
9-11 Sep	Regional Mariculture Conference, Qingdao, China
23-25 Sep	5th RWG-Ecosystem Meeting, Taean, ROK
23-25 Sep	5th RWG-Fisheries Meeting, Shanghai, China
5-6 Oct	2nd Phase 2 Working Group, Shanghai, China
8-10 Oct	5th RWG-Pollution Meeting, Xiamen, China
14-16 Oct	5th RWG-Investment Meeting, Shanghai, China

27 Oct	International Wetlands Symposium, Changwon, ROK
2 Nov	YSP-3, Changwon, ROK
25-26 Nov	5th RSTP Meeting, Shanghai, China
27-28 Nov	5th PSC Meeting, Shanghai, China
15-16 Dec	YOC-2008 Final Workshop, Ansan, ROK

Annex II

Expenditure Report for 2008

<<Available upon request>>

Annex III

PMO's Inventory of Non-Expendable Property

Period	PROJECT EXPENDITURE						EXPENDITURE AMOUNT		Autho-rization	Ref
	BUDGET LINES	ACCOUNT	ACCOUNT DESCRIPTION				LC	US$ equi		
Dec.04	4205	72800	Office Equipment	LCD Projector	O-04-001	PLC-XT15KA(SANYO)	KRW 3,540,000	**3,361.82**	**34**	
Dec.04	4205	72800	Office Equipment	Scanner	O-04-002	EPSON Perfection 1270	KRW 102,000	**96.87**	**34**	
Dec.04	4201	72800	IT Equipment	Lap-top Computer	I-04-001	Toshiba	KRW 1,960,000	**1,861.35**	**34**	Inculding OS Software(130,000)
Dec.04	4201	72800	IT Equipment	Lap-top Computer	I-04-002	Toshiba	KRW 1,960,000	**1,861.35**	**34**	Inculding OS Software(130,000)
Dec.04	4302	72200	Furniture	Partition	F-04-001	KF124 * 2	KRW 354,400	**336.56**	**34**	
Jul.05	**4302**	**72200**	**Furniture**	**Partition**	F-04-001	**(KF124 * 2)**	**-KRW 91,314**	**(89.17)**		**Disposal on 2005**
Dec.04	4302	72200	Furniture	Partition	F-04-001	KF104W * 5	KRW 775,500	**736.47**	**34**	
Jul.05	**4302**	**72200**	**Furniture**	**Partition**	F-04-001	**(KF104W * 5)**	**-KRW 28,904**	**(28.23)**		**Disposal on 2005**
Dec.04	4302	72200	Furniture	Partition	F-04-001	KF084W *2	KRW 266,000	**252.61**	**34**	
Dec.04	4302	72200	Furniture	Connector	F-04-001	KF5214 T * 2	KRW 35,800	**34.00**	**34**	
Dec.04	4302	72200	Furniture	Connector	F-04-001	KF5114 L * 1	KRW 15,200	**14.43**	**34**	
Dec.04	4302	72200	Furniture	Connector	F-04-001	KF6014 * 6	KRW 49,800	**47.29**	**34**	
Dec.04	4302	72200	Furniture	Partition	F-04-001	KF126 * 5	KRW 1,055,000	**1,001.90**	**34**	
Jul.05	**4302**	**72200**	**Furniture**	**Partition**	F-04-001	**(KF126 * 5)**	**-KRW 42,527**	**(41.53)**		**Disposal on 2005**
Dec.04	4302	72200	Furniture	Partition	F-04-001	KF106 * 2	KRW 357,200	**339.22**	**34**	
Jul.05	**4302**	**72200**	**Furniture**	**Partition**	F-04-001	**(KF106 * 2)**	**-KRW 15,649**	**(15.28)**		**Disposal on 2005**
Dec.04	4302	72200	Furniture	Connector	F-04-001	KF5216 T * 1	KRW 21,400	**20.32**	**34**	
Dec.04	4302	72200	Furniture	Connector	F-04-001	KF5116 L * 1	KRW 20,000	**18.99**	**34**	
Dec.04	4302	72200	Furniture	Connector	F-04-001	KF6016 * 5	KRW 48,500	**46.06**	**34**	

Period	PROJECT EXPENDITURE						EXPENDITURE AMOUNT		Autho-rization	Ref
	BUDGET LINES	ACCOUNT	ACCOUNT DESCRIPTION				LC	US$ equi		
Jul.05	**4302**	**72200**	**Furniture**	**Partition**	F-04-001	**(KF6016 * 4)**	**-KRW 5,706**	**(5.57)**		**Disposal on 2005**
Dec.04	4302	72200	Furniture	Multi-Bar	F-04-001	KA0012 * 6	KRW 103,200	**98.01**	**34**	
Dec.04	4302	72200	Furniture	Multi-Bar	F-04-001	KA0008 * 1	KRW 12,400	**11.78**	**34**	
Dec.04	4302	72200	Furniture	Horizontal Shelf	F-04-001	KA0101 * 7	KRW 28,700	**27.26**	**34**	
Dec.04	4302	72200	Furniture	Supplies Shelf	F-04-001	KA0104 * 7	KRW 24,500	**23.27**	**34**	
Dec.04	4302	72200	Furniture	Pencil Case	F-04-001	KA0106 * 7	KRW 14,700	**13.96**	**34**	
Dec.04	4302	72200	Furniture	Shelve	F-04-001	KT3312 * 3	KRW 429,000	**407.41**	**34**	
Dec.04	4302	72200	Furniture	Chair	F-04-002	CH2301	KRW 112,500	**106.84**	**34**	
Dec.04	4302	72200	Furniture	Shelve	F-04-001	KT3010 * 3	KRW 130,200	**123.65**	**34**	
Dec.04	4302	72200	Furniture	Cabinet	F-04-003	SC0085W5 * 2	KRW 252,400	**239.70**	**34**	
Dec.04	4302	72200	Furniture	Cabinet	F-04-004	SB0082W2 * 2	KRW 95,400	**90.60**	**34**	
Dec.04	4302	72200	Furniture	Cabinet	F-04-005	SC0085W5 * 4	KRW 505,200	**479.77**	**34**	
Dec.04	4302	72200	Furniture	Cabinet	F-04-006	SC0082W2 *1	KRW 86,900	**82.53**	**34**	
Dec.04	4302	72200	Furniture	Cabinet Door	F-04-004	SB0082W2 * 5	KRW 238,500	**226.50**	**34**	
Dec.04	4302	72200	Furniture	Conference Table	F-04-007	SR118	KRW 214,500	**203.70**	**34**	
Dec.04	4302	72200	Furniture	Chair	F-04-008	CH0011AF * 6	KRW 605,400	**574.93**	**34**	
Dec.04	4302	72200	Furniture	Folding Table	F-04-009	CR9006 * 1	KRW 116,800	**110.92**	**34**	
Dec.04	4302	72200	Furniture	Cabinet	F-04-0010	SC982F 800	KRW 111,000	**105.41**	**34**	
Dec.04	4302	72200	Furniture	Cabinet	F-04-0011	SC982C 800	KRW 367,600	**349.10**	**34**	
Dec.04	4302	72200	Vehicle	Motor Vehicle	V-04-001	Hyundai Trajet 2.0 A/T	KRW 24,094,000	**22,881.29**	**30**	
Jul.05	4104/4201	72800	IT Equipment	Office Software	I-05-001	Windows XP Pro (Kor)	355,000	**354.65**	**PO%192 81-44,45**	krw 355,000 * 1ea
Jul.05	4104/4201	72800	IT Equipment	Office Software	I-05-002	MS windows XP Pro (Eng)	1,155,000	**1,153.85**	**PO%192 81-44,45**	krw 385,000 * 3ea
Jul.05	4104/4201	72800	IT Equipment	Office Software	I-05-003	MS windows XP Pro - OLP NL (Eng)	3,390,000	**3,386.61**	**PO%192 81-44,45**	krw 565,000 * 6ea
Jul.05	4104/4201	72800	IT Equipment	Office Software	I-05-004	H Office 2003 Pro - OLP NL (Kor)	456,000	**455.54**	**PO%192 81-44,45**	krw 456,000 * 1ea
Jul.05	4104/4201	72800	IT Equipment	Office Software	I-05-005	Acrobat 7.0 Std		**899.10**	**PO%192**	krw 300,000 * 3ea

Period	PROJECT EXPENDITURE						EXPENDITURE AMOUNT		Autho-rization	Ref
	BUDGET LINES	ACCOUNT	ACCOUNT DESCRIPTION				LC	US$ equi		
						(Eng)	900,000		**81-44,45**	
Nov.05	4104	72800	IT Equipment	Office Software	I-05-006	MS Project 2003 Std - OLP NL (Eng)	650,000	**623.20**	**PO#29386-14**	1ea
Nov.05	4201	72800	IT Equipment	Lap-top Computer	I-05-007	Fujitsu S6240-SDM16	1,700,000	**1,629.91**	**PO#29386-13**	
Apr.05	4201	72800	IT Equipment	Portable Hard Disk	I-05-008		CNY 640	**77.91**	**PO#19281-44**	
May.05	4201	72800	IT Equipment	Lap-top Computer	I-05-009	Fujitsu S7011SF16	KRW 1,760,000	**1,777.60**	**PO#19281-44**	
Jun.05	4201	72800	IT Equipment	DVD Read/Writer	I-05-0010			**198.98**	**PO#19281-44**	
Mar.05	4204	72200	Office Equipment	Copy machine	O-05-001	Cannon IC-D380H	KRW 550,000	**550.00**	**PO#17811-01**	
Apr.05	4210	72200	Office Equipment	Digital Camera	O-05-002	Nikon Coolpix3700	KRW 279,000	**281.36**	**PO#19281-38**	
Apr.05	4210	72200	Office Equipment	Type Writer	O-05-003	ET-3800 Kyungbang Co.	KRW 200,000	**201.69**	**PO#17811-07**	
May.05	4210	72200	Office Equipment	Safety Box	O-05-004	Bum Il ESD-104A(Digital Double Locking)	KRW 299,000	**301.99**	**PO#19281-38**	
May.05	4210	72200	Office Equipment	Conference Call Machine	O-05-005	SoundPointPro225	KRW 370,000	**372.38**	**PO#19281-38**	
Jul.05	4302	72200	Furniture	Task Chair	F-05-002	CH0011AF * 8 (615*530*785)	KRW 896,000	**883.72**	**PO#19281-39**	KRW 112,000
Jul.05	4302	72200	Furniture	Famillia Chair	F-05-003	CH2301 * 1 (620*595*870~970)	KRW 125,000	**123.29**	**PO#19281-39**	KRW 125,000
Jul.05	4302	72200	Furniture	Desk	F-05-004	TD016 * 2 (1600*800*720)	KRW 426,000	**420.16**	**PO#19281-39**	KRW 213,000
Jul.05	4302	72200	Furniture	Extension desk	F-05-005	SD912F * 1 (600*1200*720)	KRW 139,000	**137.09**	**PO#19281-39**	KRW 139,000
Jul.05	4302	72200	Furniture	Endless cabinet	F-05-006	SC982C * 2 (800*290*1920)	KRW 204,000	**201.20**	**PO#19281-39**	KRW 102,000
Jul.05	4302	72200	Furniture	Square table	F-05-007	SR024S * 1 (2400*900*720)	KRW 312,000	**307.72**	**PO#19281-39**	KRW 312,000
Jul.05	4302	72200	Furniture	Folding Table	F-05-008	CR9006 * 1	KRW 113,000	**111.45**	**PO#192**	KRW 113,000

Period	PROJECT EXPENDITURE						EXPENDITURE AMOUNT		Autho-rization	Ref
	BUDGET LINES	ACCOUNT	ACCOUNT DESCRIPTION				LC	US$ equi		
						(590~610*480~520*720)			81-39	
Jul.05	4302	72200	Furniture	Partition	F-05-001	KF104W * 9 (1000*66*1370)	KRW 1,557,000	**1,535.65**	PO#19281-39	KRW 173,000
Jul.05	4302	72200	Furniture	Partition Frame	F-05-001	KF0104 * 2 (1000*34*1370)	KRW 96,000	**94.68**	PO#19281-39	KRW 48,000
Jul.05	4302	72200	Furniture	Partition Frame	F-05-001	KF0124 * 5 (1200*34*1370)	KRW 265,000	**261.37**	PO#19281-39	KRW 53,000
Jul.05	4302	72200	Furniture	Partition tile	F-05-001	KF1106 * 4 (1000*14*600)	KRW 104,000	**102.57**	PO#19281-39	KRW 26,000
Jul.05	4302	72200	Furniture	Partition tile	F-05-001	KF1126 * 10 (1200*14*600)	KRW 300,000	**295.89**	PO#19281-39	KRW 30,000
Jul.05	4302	72200	Furniture	L Shape connector	F-05-001	KF5114 L * 6 (H: 1370)	KRW 96,000	**94.68**	PO#19281-39	KRW 16,000
Jul.05	4302	72200	Furniture	Endong	F-05-001	KF6014 * 10 (H: 1370)	KRW 90,000	**88.77**	PO#19281-39	KRW 9,000
Jul.05	4302	72200	Furniture	Leg	F-05-001	KF8001 * 2	KRW 44,000	**43.40**	PO#19281-39	KRW 22,000
Jul.05	4302	72200	Furniture	Shelf	F-05-001	KT3010 * 2 (1000*360*200)	KRW 96,000	**94.68**	PO#19281-39	KRW 48,000
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	System Case_Portavrace DSR with Matte Box	NZD 419.61	**309.84**	PO%35736-10	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Headphone_Sennheiser HD202 Closed back monitor	NZD 56.00	**41.35**	PO%35736-10	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Video Camcoder	NZD 4,747.50	**3,505.55**	PO%35736-10	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Video Light HVL20DW2	NZD 112.50	**83.07**	PO%35736-10	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Battery Pack - NPF970	NZD 483.76	**357.21**	PO%35736-10	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	AC Adaptor and Power Charger ACVQ1050D	NZD 237.96	**175.71**	PO%35736-10	

Period	PROJECT EXPENDITURE						EXPENDITURE AMOUNT		Autho-rization	Ref
	BUDGET LINES	ACCOUNT	ACCOUNT DESCRIPTION				LC	US$ equi		
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Wireless Lavaliere Mike Kit UWPC1	NZD 686.25	**506.73**	**PO%35736-10**	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Tripod/Stand	NZD 151.88	**112.15**	**PO%35736-10**	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	DVCAM Tapes VF58CPKS	NZD 239.00	**176.48**	**PO%35736-10**	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	IEEE DV Cable	SGD 145.00	**89.51**	**PO%35736-10**	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Headphone port adaptor	SGD 12.00	**7.41**	**PO%35736-10**	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Memory Stick	SGD 95.00	**58.64**	**PO%35736-10**	
Mar.06	4210	72200	Office Equipment	SONY Camcoder	O-06-001	Rain Cofer + Shipping		**99.90**	**PO%35736-10**	
Feb.06	4201	72800	IT Equipment	Lap-top Computer	I-06-001	Toshiba M50-03601S	KRW 1,400,000	**1,452.28**	**PO%35736-15**	
Jun.06	4201	72800	IT Equipment	Office Server	I-06-002	AS-PE1800 - Dell TM Power Edge TM 1800 Server	KRW 3,968,000	**4,252.95**	**PO%41557-12, PO%35736-15**	
Dec.06	4104	72800	IT Equipment	Office Software	I-06-003	Expert Choice Software	KRW 3,900,000	**4,190.98**	**PO%53903-03**	
Nov.06	4205	72200	Office Equipment	LCD Projector	O-06-002	Sony CX20		**1,560.00**	**PO%46928-08**	
Nov.06	4203	72200	Office Equipment	Printer	O-06-003	Cannon I90 Printer		**250.00**	**PO%46928-08**	
Nov.06	4210	72200	Office Equipment	Scanner	O-06-004	Scanner HP Scanjet7650	KRW 653,600	**688.00**	**PO%46928-08**	
Jun.07	4302	72200	Furniture	Shelves	F-07-001	Shelving units for container	KRW 170,000	**184.78**	**PO%61923-16**	
Jun.07	4302	72200	Furniture	Container	F-07-002	Container	KRW 1,200,000	**1,304.34**	**PO%61923-16**	
Jun.07	4302	72200	Furniture	Double drawer	F-07-003	TP0312W (420*560*570)	KRW 264,000	**286.96**	**PO%61923-16**	2EA
Jun.07	4302	72200	Furniture	Farmilar Chair	F-07-004	CH2301 (620*595*870~970)	KRW 126,000	**136.96**	**PO%61923-16**	1EA

Period	PROJECT EXPENDITURE						EXPENDITURE AMOUNT		Autho-rization	Ref
	BUDGET LINES	ACCOUNT	ACCOUNT DESCRIPTION				LC	US$ equi		
Jun.07	4302	72200	Furniture	Topline Desk	F-07-005	TD016 (1600*800*720)	KRW 213,000	**231.52**	**PO%619 23-16**	1EA
Jun.07	4302	72200	Furniture	L-shape Connector	F-07-003	KF5514 (H:1370)	KRW 19,000	**20.65**	**PO%619 23-16**	1EA
Jun.07	4302	72200	Furniture	Partition	F-07-003	KF068W (600*66*1770)	KRW 154,000	**167.39**	**PO%619 23-16**	1EA
Jun.07	4302	72200	Furniture	Partition	F-07-003	KF108W (1000*66*1770)	KRW 220,000	**239.13**	**PO%619 23-16**	1EA
Jun.07	4302	72200	Furniture	Partition	F-07-003	KF128W (1200*66*1770)	KRW 256,000	**278.26**	**PO%619 23-16**	1EA
Jun.07	4302	72200	Furniture	L-shape Connector	F-07-003	KF5118 (H:1770)	KRW 24,000	**26.09**	**PO%619 23-16**	1EA
Jun.07	4302	72200	Furniture	Ending Connector	F-07-003	KF6018 (H:1770)	KRW 24,000	**26.09**	**PO%619 23-16**	2EA
Jun.07	4302	72200	Furniture	Folding Table	F-07-006	CR9006 (630*525*720)	KRW 260,000	**282.61**	**PO%619 23-16**	2EA
Aug.08	4201	72800	IT Equipment	Lap-top Computer	I-08-001	Lenovo Thinkpad	KRW 1,145,400	**1,150.00**	**PO#101 563-03**	
Aug.08	4201	72800	IT Equipment	Lap-top Computer	I-08-002	Lenovo Thinkpad	KRW 1,145,400	**1,150.00**	**PO#101 563-03**	
				Total Amount as of Oct 2008				**76,469.69**		
						IT Equipment		26,476.26		
						Furniture		13,924.50		
						Vehicle		22,881.29		
						Office Equipment		13,187.65		

Annex IV

List of Acronyms

CBA	cost-benefit analysis
CDOM	coloured dissolved organic matter
CKJORC	China-Korea Joint Ocean Research Center
COP	conference of parties
CRM	certified reference material
DPRK	Democratic People's Republic of Korea
ECC	ecosystem carrying capacity
FIO	First Institute of Oceanography - China
FRRF	fast rate repetition flourimeter
FSS	Forensic Scientific Services - Australia
GEF	Global Environment Facility
GIS	geographic information system
HAB	harmful algal bloom
HPLC	high performance liquid chromatography
IAEA-MEL	International Atomic Energy Agency-Marine Environmental Laboratory
ICC	International Coastal Cleanup
IMCC	Inter-ministerial Co-ordinating Committee
IMTA	integrated multi-trophic aquaculture
IW:LEARN	International Waters:Learning Exchange and Resource Network
KEI	Korea Environment Institute - ROK
KORDI	Korea Ocean Research and Development Institute
MLTM	Ministry of Land, Transport and Maritime Affairs - ROK
MOMAF	Ministry of Maritime Affairs and Fisheries - ROK
MoU	Memorandum of Understanding
NFRDI	National Fisheries Research and Development Institute - ROK
NGO	Non-Governmental Organisation
NMEMC	National Marine Environment Monitoring Center - China
NOWPAP	Northwest Pacific Action Plan
NPC	National Project Co-ordinator
NWG	National Working Group
NSAP	National Yellow Sea Action Plan
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PIF	Project Identification Form
PMO	Project Management Office
PSAA	political and social acceptance analysis
PSC	Project Steering Committee
PSP	paralytic shellfish poisoning
QA/QC	quality assurance/quality control
ROK	Republic of Korea
RSTP	Regional Scientific and Technical Panel
RWG	Regional Working Group
RWG-F, E, B, I	Regional Working Group – Fisheries, Ecosystem, Biodiversity, Investment
SAP	Strategic Action Programme
SOA	State Oceanic Administration - China
TDA	Transboundary Diagnostic Analysis
TSM	total suspended matter
UN	United Nations

UNDP	United Nations Development Programme
UNOPS	United Nations Office for Project Services
WESTPAC	Western Pacific (Intergovernmental Oceanographic Commission of UNESCO, Sub-commission)
WSMRI	West Sea Mariculture Research Institute - ROK
WWF	World Wide Fund for Nature
YSESP	Yellow Sea Ecoregion Support Project
YSFRI	Yellow Sea Fisheries Research Institute - China
YSLME	Yellow Sea Large Marine Ecosystem
YSP	Yellow Sea Partnership