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

UNDP/GEF/YS/RWG-E.2/3
Date: 2 December 2005
English only

Second Meeting of the Regional Working Group for the Ecosystem Component
Shanghai, China, 29 November to 2 December 2005

Meeting Report

1 OPENING OF THE MEETING

1.1 Welcome addresses

1.1.1 On behalf of the United Nations Development Programme (UNDP) and United Nations Office for Project Services (UNOPS), Mr. Yihang Jiang, Project Manager, opened the meeting and welcomed the members of the Regional Working Group-Ecosystem (RWG-E) to China. Mr. Jiang specially welcomed the large number of observers, noting that the wide participation of relevant institutes and experts will assist with the successful implementation of the project.

1.1.2 Mr. Jiang mentioned that the Meeting would focus on the review of the data and information collection activity, finalisation of the upcoming co-operative study cruises, and providing guidance to upcoming activities that would contribute to the Transboundary Diagnostic Analysis (TDA). Finally, in order to facilitate the discussions and expected outputs of this meeting, Mr. Jiang gave an overview of the outcomes from the other four RWG meetings that had been held prior to this one.

1.1.3 Mr. Yoo Sinjae, Chairperson of the RWG-E, welcomed all participants to the meeting, and thanked the Chinese colleagues for arranging the meeting. He mentioned the critical time in which this meeting is being held, as it is a turning point for planning and achieving the tangible outputs expected of the Project by the middle of 2006.

1.2 Introduction of members

1.2.1 Participants were invited to introduce themselves and to give a brief introduction on their background and roles in the Project. The list of participants is attached to this report as Annex I.

2 ORGANISATION OF THE MEETING

2.1 Documentation Available to the Meeting

2.1.1 Mr. Yoo invited the Secretariat to introduce this agenda item. Ms. Connie Chiang of the Project Management Office (PMO) introduced the Meeting's working and information documents prepared by the PMO, with emphasis on activity progress reports and activities to be implemented.

2.2 Organisation of Work

2.2.1 The PMO presented the provisional working programme for the Meeting.

2.2.2 The Chairperson informed the Meeting about the organisation of work. It was agreed that, due to the nature of the agenda items to be discussed, the Meeting would be organised in plenary as far as possible. Sessional working groups would be formed if deemed necessary.

2.2.3 The meeting was conducted in English.

3 ADOPTION OF THE MEETING AGENDA

3.1 Mr. Yoo introduced the Provisional Agenda and Provisional Annotated Agenda.

3.2 Ms. Chiang mentioned that the PMO would like to give a presentation on the contracting procedures of UNOPS, and requested the Chairperson to allocate some time during the meeting to include this short session. The Chairperson suggested that this topic be included at the start of Agenda Item 6.

3.3 Mr. Yoo suggested that Agenda 5.2, "Co-operative Study Cruises," should be carried out via working groups to check and finalise the details of the cruises.

3.4 Following the above suggestions, members adopted the agenda with the above changes. The revised agenda is attached as Annex II to this report.

4 EXPECTED OUTPUTS FROM THE 2ND RWG-E MEETING

4.1 The Chairperson invited the Secretariat to present the expected outputs of the Meeting. Ms. Chiang presented a list of the outputs expected to be achieved, and provided some details for each agenda item's objective.

4.2 Mr. Jiang mentioned that the regional data synthesis activity should not be limited to producing the TDA, but together with the national data reviews, could also be used for producing additional publications on the status of the Yellow Sea ecosystem.

4.3 Mr. Yoo asked all participants to review the list of expected outputs, and make sure that they are clear on what to achieve for each agenda item.

4.4 As some participants were new to the Project, Mr. Yoo asked the PMO to explain the TDA and Strategic Action Programme (SAP) process. Mr. Jiang did so for the benefit of the meeting, and participants took note of Mr. Jiang's presentation.

4.5 A question was raised on what information the RWG-E could provide for the TDA and SAP. Mr. Jiang clarified that the RWG-E should define what they mean by "ecosystem," and how the ecosystem chapter of the TDA should incorporate and harmonise the various ecosystem-related characteristics from other Project components. Members recalled that the work of this group will focus on lower trophic levels. However, it was noted that the RWG-E should keep a comprehensive ecosystem perspective in preparing the ecosystem chapter of the TDA.

4.6 Mr. Jiang also informed the meeting that the draft Project's budget revision for 2005 had already been completed, without considering the outputs from this meeting. This was because the 2nd Regional Scientific and Technical Panel and Project Steering Committee would meet in less than two weeks after the completion of this meeting, and documents for these two meetings had to be finalised before the RWG-E Meeting. However, this should not prevent members from considering additional outputs and activities for the future.

4.7 Members noted the expected outputs for the meeting, and agreed to keep these in mind during the discussion of the relevant agenda items.

5 CONSIDERATION OF ON-GOING ACTIVITIES UNDER THE ECOSYSTEM COMPONENT

5.1 Data and Information Collection

5.1.1 Mr. Zhang Xuelei presented the progress report for the data and information collection activity of China, focusing on the biological data. Mr. Zhang showed some data on:

- phytoplankton from net samples;
- HAB events from 1970s to present;
- macrobenthos data from seasonal cruises, categorised into 4 major groups;
- sediment;
- salinity data averaged from 1958 to 1978; and
- a Chinese report on environment and biota in Yellow Sea.

5.1.2 Mr. Zhang noted that the data that have been collected are mostly raw data, and will need to be processed. He mentioned some data gaps, such as phytoplankton information is only from net samples, and some raw data are held by other institutes, not First Institute of Oceanography (FIO), and cannot be released to FIO. Mr. Zhang also showed some remote sensing data of monthly primary production in the Yellow Sea from 1997-2002, stating that the data was not yet calibrated.

5.1.3 Finally, Mr. Zhang showed data from case studies on ecosystem change in the Yellow Sea basin. These include trends in: environmental and community changes, transparency, nutrient availability, and aquaculture development.

5.1.4 Mr. Qiao Fangli presented China's physical data collected to date, namely, temperature and salinity in the Yellow Sea, by month, from 1930 to the present. Mr. Yoo asked whether any analysis for long-term changes would be carried out, and Mr. Qiao said that he could do so.

5.1.5 Mr. Heo Seung presented the progress report for Korea's data and information collection activity, showing:

- some physical data;
- phytoplankton distribution in 1992;
- zooplankton from 1978 to present;
- benthos in 1992;
- HAB monitoring by National Fisheries Research and Development Institute (NFRDI) from 1984 to present; and
- the sampling areas and stations.

5.1.6 As it was not clear whether the presented data could produce a time series picture of the Yellow Sea ecosystem, members were requested to produce a table for each country showing the minimum available data from each decade (from before 1960 to 2000), and which data had already been collected by each team (see Annex III).

5.1.7 Mr. Hong Jae-Sang mentioned three benthos data sets that may be available for the Yellow Sea: 1958-59 and 1975-76 surveys carried out by China, and 1953-71 survey carried out by a Japanese research institute through dredging. Contractors were encouraged to look into these data sets to see whether the data are usable.

5.1.8 During the discussions, participants talked about how to present the data in a standardised format, such as how to aggregate the information by temporal and spatial scales, and how to present the final product to the consultant that will carry out the regional synthesis. It was suggested that spatial aggregation could be shown by dividing the Yellow Sea into three zones – coastal areas of Korea, coastal areas of China, middle of Yellow Sea – or into five zones by nutrient supply areas – well-mixed areas, fronts, middle of sea, warm current area, mouth of Yangtze River. **Members agreed that all sampling points with the associated data should be provided in the final report, as this would assist the completion of regional synthesis.**

5.1.9 As no consensus could be reached on dividing the Yellow Sea into zones, **participants agreed that the national reports should show, as much as possible, data of the variables as agreed during the 1st RWG-E Meeting. The reports should also include "status indices."** A table of status indices was produced (See Annex IV). However, as the final list of indices used to present the data are dependent on the specifics of actual data that will be collected, it was emphasised that this table is tentative.

5.1.10 Participants further agreed that at the end of February 2006, members should exchange their metadata, e.g. sampling gear used, or limitations of datasets. Only then, will the members decide on the most robust/practical indices to use, will finalise the table of indices, and present the final product according to the indices.

5.1.11 The Chairperson agreed to prepare a draft table of metadata that will be used by the data collection teams to finalise the presentation of data.

5.1.12 Members agreed that the data collection teams should complete the final draft of their report by 15 February 2006, in order to allow time to compare the data and finalise the presentation.

5.2 Co-operative Study Cruises

5.2.1 Ms. Chiang explained the need to re-visit the Ecosystem Component's requirements for the co-operative study cruises, mainly to finalise some outstanding issues concerning cruise personnel and their responsibilities, equipment needed, and the contracts for this activity.

5.2.2 Members reviewed and finalised the list of personnel, equipment needed, and work to be done during the cruise. Members also included in the table, the tentative work to be done during the spring cruise (benthos, sediment core sampling). The table is attached as Annex V.

5.2.3 Ms. Chiang alerted the Meeting that the Fisheries Component needed another person for its team, and was examining the possibility of whether the Ecosystem Group could reduce one on-board person since all other groups had finalised their personnel.

5.2.4 Given the amount of work needed to be done during the cruise by the Ecosystem Group, members concluded that they could not reduce their number of on-board members. There was a brief discussion on whether the Biodiversity Group could reduce one of their members. **The PMO agreed to inform the Fisheries Group of**

this decision, and will resolve the matter after discussing with the Fisheries and Biodiversity Groups.

6 ACTIVITIES TO BE IMPLEMENTED DURING 2005 TO 2006

6.1 Introduction of UNOPS Contracting Procedures

6.1.1 Before members began discussing the upcoming activities, Ms. Chiang explained the general UNOPS contracting procedures, in order to provide members with a better understanding of the different types of contracts and responsibilities of all contracting parties. Ms. Chiang emphasised that the PMO should be copied on all correspondence between the contractor and UNOPS, when contracts are directly executed by UNOPS. This will enable the PMO to keep track of the implementation process, and to follow up if problems arise with the contracts.

6.1.2 Members took note of the information provided, and will follow the procedures in due course.

6.2 Regional Data and Information Synthesis

6.2.1 Members reviewed the draft job description and qualifications for the consultant to carry out this task, and suggested some changes. Members also suggested persons that are qualified to carry out this task. The PMO will contact the suggested consultants, and ask them to bid for the work that will be carried out from January to June 2006.

6.2.2 **The meeting agreed with the job description that is attached as Annex VI.**

6.3 Regional Synthesis for Assessing Carrying Capacity

6.3.1 During the discussion, members felt that the definition of "ecosystem carrying capacity" should first be agreed on, in order to determine how to implement this activity. Members felt that information on productivity in the 1st and 2nd trophic levels can be obtained, and can be provided to the Fisheries Group to contribute to assessing the ecosystem's carrying capacity.

6.3.2 The discussion resulted in the conclusion that this activity is more relevant to the SAP Phase because the determination of carrying capacity will be used in the management actions to be included in the SAP. It was suggested that the consultant could first obtain information on methodology to assess carrying capacity. **In the meantime, members agreed to draft the Terms of Reference (TOR) for this activity, and the Chairperson will forward the final TOR to the PMO.**

6.4 Regional Synthesis for Identifying and Ranking Stresses on the Ecosystem

6.4.1 **Members agreed that this activity should be combined with the regional data synthesis**. Furthermore, the national data collection activity will provide relevant information to the regional data synthesis. **Members agreed that the funds for this activity should be reallocated for other activities.**

6.5 Strategy for Monitoring Changes in Ecosystem

6.5.1 **Members agreed that this activity would be more appropriately titled, "Regional Guidelines for Monitoring Changes in the Ecosystem."**

6.5.2 Members reviewed the draft job description and qualifications for the consultant to carry out this task, and suggested some changes. Members also suggested persons that are qualified to carry out this task based on the tasks listed. The PMO will contact the suggested consultants, and ask them to bid for the work that will be carried out from July to December 2006.

6.5.3 **The agreed job description is attached as Annex VI.**

6.6 Demonstration of New and Innovative Technologies for Monitoring Ecosystem

6.6.1 Mr. Zhu Mingyuan briefly explained how the continuous plankton recorder (CPR) might be used for monitoring via ship-of-opportunities, and would be first tested during the spring co-operative study cruise. Discussions featured on how the CPR could be used on the cruise, as there might be complications with the equipment being caught up in the numerous fish nets in the sea. As the CPR will be delivered to First Institute of Oceanography, FIO noted that its cruise staff should undergo training and be familiar with using the equipment before the spring cruise.

6.6.2 Since the CPR will be kept at FIO, **FIO agreed that future activities using the CPR should be relevant to the Project's and long-term monitoring objectives, and the data generated from the equipment should be shared with the project partners**.

6.7 Capacity Building – Regional Workshop on Remote Sensing

6.7.1 Mr. Yoo gave a presentation on the background of using remote sensing to understand primary productivity in the Yellow Sea. He stated that there is currently insufficient understanding of this subject due to the high variation in available spatial and temporal data; however, satellite data can help to solve some of these variability problems, although with limitations, as the Yellow Sea belongs to Case 2 waters.

6.7.2 Mr. Yoo suggested two kinds of workshops could be held: 1) a technical workshop to compare and recommend the best ocean colour algorithm suitable for the Yellow Sea; or 2) a training workshop on using remote sensing. He informed the meeting that as there is no operational algorithm that can be used in the Yellow Sea, it might be better if the technical workshop could be organised at a later stage.

6.7.3 As there will be many other related events from now until 2007, members felt that the remote sensing workshop could be held in conjunction with one of the pre-planned activities, some of which include the Project's science conference, EAS Congress, and a Korea-Japan remote sensing workshop. This issue will be finalised during the 3rd RWG-E Meeting.

6.7.4 Participants felt that an originally-planned training workshop on carrying capacity would not be too useful. **Members agreed that the funds for this activity should be reallocated for activities to fill gaps in carrying capacity estimation**.

6.8 Preparation of the Ecosystem Component in the Draft TDA

6.8.1 Members reviewed the preliminary causal chain analysis prepared during the 1st RWG-E Meeting, and noted for which impacts and causes data will be available, or from which Project Component the data might be available.

6.8.2 The revised causal chain analysis is attached as Annex VII.

7 WORKPLAN FOR 2005 TO 2006

7.1 Members reviewed the workplan for 2005 to 2006. **The meeting agreed to compile a table showing the agreements, actions and deadlines for the activities.** The table of actions, responsible persons and deadlines was discussed and agreed, and is shown below.

Agreement / Action	Responsible Party	Deadline	Status of Action (as of 1 Dec 2005)
Data & Information Collection			
Action: complete the final draft report to allow time to compare the data and finalise the presentation	China / Korea data collection teams	15 Feb 06	
Action: prepare a draft table of metadata to be used by the data collection teams to finalise the presentation of data	RWG-E Chairperson	20 Feb 06	
Action: exchange their metadata, then, decide on the most robust/practical indices to use in final presentation	China / Korea data collection teams	28 Feb. 06	
Action: provide sampling points in the final report, to assist with regional synthesis	China / Korea data collection teams	31 Mar. 06	
Action: final reports to show, as much as possible, data according to agreed table	China / Korea data collection teams	31 Mar. 06	
Co-operative Study Cruise - Winter			
Agreed: not to reduce on-board personnel	RWG-E Members	30 Nov. 05	Done
Action: inform RWG-B, F groups of change in RWG-B team member	PMO	5 Dec. 05	

Agreement / Action	**Responsible Party**	**Deadline**	**Status of Action (as of 1 Dec 2005)**
Spring Cruise **Action:** finalise # persons, benthos / core samples, budget estimation	Dr. Hong / Zhang / RWG-E Chairperson	9 Dec. 05	
Consultant – Regional Data Synthesis (Jan – Jun 06) **Action:** send SOW to recommended consultants **Action**: completion of synthesis	PMO Consultant	Week of 5 Dec. 05 30 Jun 06	
Consultant – Regional synthesis to assess carrying capacity (Aug 06 – July 2007) **Action:** draft TOR and provide to PMO for advertising **Action**: completion of synthesis	RWG-E Members and Chairperson Consultant	31 May 06 31 July 2007	
Consultant – Regional Synthesis for Identifying and Ranking Stresses on the Ecosystem (Jan – Jun 06) **Agreed:** combine activity with regional data synthesis **Action**: completion of synthesis **Action**: reallocate this budget to other activity	RWG-E Members Consultant RWG-E Members and PMO	1 Dec. 05 30 Jun 06 10 Dec. 05	
Strategy for Monitoring Changes in Ecosystem (Jul - Dec 06) **Action:** changed title from “strategy” to “regional guidelines; finalised job description **Action**: send SOW to recommended consultants **Action**: completion of guidelines	RWG-E Members PMO Consultant	30 Nov. 05 Jun 06 30 Dec 06	done

Agreement / Action	Responsible Party	Deadline	Status of Action (as of 1 Dec 2005)
Demonstration of New and Innovative Technologies for Monitoring Ecosystem			
Action: test CPR on spring cruise	China E cruise team	May 06	
Agreed: future activities using CPR should contribute to YSLME Project	FIO	On-going	
Regional Remote Sensing Workshop			
Action: RS workshop co-held with other events (science conference, EAS congress, Korea-Japan workshop in 2007)	PMO and RWG-E Chairperson will discuss further and finalise	3rd RWG-E Mtg	
Training on Carrying Capacity			
Action: reallocate budget for other activity to fill gaps in carrying capacity estimation	RWG-E members and PMO	1 Dec. 05	
Causal chain analysis			
Action: revised based on current known data	RWG-E members	1 Dec. 05	done
Action: final report to include national CCA based on best available data	China / Korea data collection teams	31 Mar. 06	
Next RWG-E Meeting			
Agreed: 3rd RWG-E Meeting will be held in Jeju, Korea, 12-15 Sept. 2006	RWG-E members and PMO	1 Dec. 05	PMO will make arrangements in mid 2006

8 OTHER BUSINESS

8.1 The Chairperson invited members to raise any other issues that need to be considered by this Meeting.

8.2 Mr. Jiang asked all members to keep to the agreed meeting dates, as last minute changes create lots of additional work for the PMO to arrange the meeting and

accommodations. Changes in agreed meeting dates could also potentially delay the project's implementation schedule. Mr. Jiang commended this group for maintaining consistency in its membership, which resulted in consistent and fluid discussions, as all members were familiar with the history of the project and issues agreed on since the last RWG-E Meeting.

8.3 Finally, Mr. Jiang mentioned that members should continue their regular communications between each other and the PMO, as this enabled everyone to keep up to date on the progress of implementation.

9 DATE AND PLACE FOR 3RD RWG-E MEETING

9.1 The Chairperson invited members to consider the date and place for the 3rd RWG-E Meeting.

9.2 **Members agreed to have the Third RWG-E Meeting in Jeju, Korea, from 12-15 September 2006.**

10 ADOPTION OF THE MEETING REPORT

10.1 The Chairperson led the discussion of the draft meeting report prepared by the Secretariat. The report was reviewed, amended, and adopted by the Meeting.

11 CLOSURE OF THE MEETING

11.1 The Chairperson, participants, PMO and FIO were thanked for their contributions to a successful Meeting. The Meeting closed at 11:30 A.M. on 2nd December 2005.

Annex I

List of Participants

People's Republic of China	
Mr. ZHU Mingyuan Professor First Institute of Oceanography, SOA 6 Xianxialing Road Hi-Tech Industrial Park Qingdao, Shandong 266001 Tel: 86-532-8896-7447 Fax: 86-532-8896-7548 Mobile: 86-136-0898-3422 Email: myzhu@public.qd.sd.cn	**Mr. ZHANG Xuelei** Professor First Institute of Oceanography, SOA 6 Xianxialing Road Hi-Tech Industrial Park Qingdao, Shandong 266001 Tel: 86-532-8896-7476 Fax: 86-532-8896-7548 Email: zhangxl@fio.org.cn
Mr. QIAO Fangli Deputy Director First Institute of Oceanography, SOA 6 Xianxialing Road Hi-Tech Industrial Park Qingdao, Shandong 266001 Tel: 86-532-8896-7400 Fax: 86-532-8896-5544 Email: qiaofl@fio.org.cn	
Republic of Korea	
Mr. YOO Sinjae Senior Scientist Korea Ocean Research and Development Institute (KORDI) 1270 Sa-dong Sangnok-gu Ansan-si Gyeonggi-do 426-744 Tel: 82-31-400-6221 Fax: 82-31-408-5934 Email: sjyoo@kordi.re.kr	**Mr. HONG Jae-Sang** Professor Department of Oceanography Inha University Incheon 402-751 Tel: 82-32-860-7705 Fax: 82-32-863-7468 Email: jshong@inha.ac.kr
Ms. KANG Young Shil Chief, Oceanography and Marine Environment Team West Sea Fisheries Research Institute (NFRDI) 707, Eulwang-dong, Jung-gu Incheon 400-420 Tel : 82-32-745-0550 Fax : 82-32-745-0549 E-mail : yskang@nfrdi.re.kr	**Mr. KANG Daeseok** Professor Div. of Environmental System Engineering Pukyung National University 599-1 Daeyeon 3-dong, Nam-gu Busan 608-737 Tel: 82-51-620-6442 Fax: 82-51-621-8168 E-mail: dskang@pknu.ac.kr

Project Management Office (PMO)	
Mr. Yihang JIANG Project Manager UNDP/GEF Yellow Sea Project Korea Ocean Research and Development Institute 1270 Sa-dong Sangnok-gu Ansan-si Gyeonggi-do 426-744 Republic of Korea Tel: 82-31-400-7825 Fax: 82-31-400-7826 email: yihang@yslme.org	**Ms. Connie CHIANG** Environment Officer UNDP/GEF Yellow Sea Project Korea Ocean Research and Development Institute 1270 Sa-dong Sangnok-gu Ansan-si Gyeonggi-do 426-744 Republic of Korea Tel: 82-31-400-7833 Fax: 82-31-400-7826 email: connie@yslme.org
Ms. Junghwa KIM Secretary UNDP/GEF Yellow Sea Project Korea Ocean Research and Development Institute 1270 Sa-dong Sangnok-gu Ansan-si Gyeonggi-do 426-744 Republic of Korea Tel: 82-31-400-7829 Fax: 82-31-400-7826 email: junghwa@yslme.org	
Observers	
Ms. LI Ruixiang Research Professor First Institute of Oceanography, SOA 6 Xianxialing Road, Hi-Tech Industrial Park Qingdao, Shandong 266061, P.R. China Tel: 86-532-8896-7451 Fax: 86-532-896-7447 Email: liruixiang@fio.org.cn	**Mr. ZHANG Zhaohui** First Institute of Oceanography, SOA 6 Xianxialing Road, Hi-Tech Industrial Park Qingdao, Shandong 266061, P.R. China Tel: 86-532-8896-7476 Fax: 86-532-8896-7447 Email: zhang@fio.org.cn
Mr. LUO Mingbo Fisheries Environment Division East China Sea Fisheries Research Institute 300 Jungong Road Shanghai 200090 China Tel: 86-21-6568-4690 Fax: 86-21-6568-3926 Email: minbl@sohu.com	**Mr. YE Shufeng** East China Sea Environmental Monitoring Center, SOA 630 Dongtang Road Pudong New Area 200137 Shanghai, China Tel: 86-21-5109-5836 Fax: 86-21-5867-3946 Email: ysf6@vip.sina.com

Ms. XU Zhaoli East China Sea Fisheries Research Institute 300 Jungong Road Shanghai 200090 China Tel: 86-21-6568-0798 Fax: 86-21-6568-6991 Email: xiaomin@public4.sta.net.cn	**Mr. CHAO Min** East China Sea Fisheries Research Institute 300 Jungong Road Shanghai 200090 China Tel: 86-21-6568-4690 Fax: 86-21-6568-3926 Email:
Mr. HEO Seung Researcher West Sea Fisheries Research Institute (NFRDI) 707, Eulwang-dong, Jung-gu, Incheon, 400-420. KOREA Tel: 82-32-745-0533; 82-11-9316-1723 Fax: 82-32-745-0549 E-mail: sheo@nfrdi.re.kr; seungheo@hanmail.net	
Secretariat	
Ms. WANG Wenqi Vice Director of Foreign Affairs Office First Institute of Oceanography, SOA 6 Xianxialing Road Hi-Tech Industrial Park Qingdao, Shandong 266001 China Tel: 86-532-8896-3909 Fax: 86-532-8896-7548 Email: wangwq@fio.org.cn	

Annex II

Agenda

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7. WORKPLAN FOR 2005 TO 2006

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11. CLOSURE OF THE MEETING

Annex III

Status of Data Availability and Collection

*** and + denote the level of available data or collected data, with 3 marks as most available or mostly collected, and 1 mark denoting least available or very few data collected.**

Table 1. Status for Korea.

		before 1960	1960's	1970's	1980's	1990's	2000's	Remarks
Phytoplankton								
local	available							
	collected							
coastal	available				**	**	**	
	collected				??	??	??	collected by NFRDI+KORDI
open ocean	available				**	**	**	
	collected				?	?	?	collected by KORDI
Zooplankton								
local	available				*	*	*	
	collected				?	?	?	
coastal	available		*	*	**	**	**	divide data from NFRDI monitoring system
	collected							
open ocean	available		*	*	**	**	**	
	collected		?	?	3,000	3,000	3,000	(50st)*(6time/y)*(10yrs)
Benthos								
local	available						*	

		before 1960	1960's	1970's	1980's	1990's	2000's	Remarks
	collected						?	3
coastal	available				**	**		
	collected				?	20		# of data sets collected
open ocean	available				**	**		
	collected				?	29		
					1	2		1. 1982-85 by KORDI Atlas
								2. 1992 by Inha Univ.
HAB								
local	available							
	collected							
coastal	available				**	**	**	
	collected				5	27	36	# of HAB events from 1984-present of HAB monitoring system by NFRDI
open ocean	available							
	collected							

Table 2. Status for China.

		before 1960	1960's	1970's	1980's	1990's	2000's
Phytoplankton							
local	available	N/A	+	N/A	++	++	++
	collected	N/A	+	N/A	++	++	+
coastal	available	1958 seasonal	N/A	N/A	1984-85 seasonal	1992-93 twice	Spring & Summer
	collected	-	N/A	N/A	yes	atlas	-
open ocean	available	1958 seasonal	N/A	N/A	1984-85 seasonal	1992-93 twice	Spring & Summer
	collected	-	N/A	N/A	yes	atlas	-
Zooplankton							
local	available	N/A	?	N/A	++	++	++
	collected	N/A	?	N/A	++	+	+
coastal	available	1958 seasonal	N/A	N/A	1984-85 seasonal	1992-93 twice	Spring & Summer
	collected	-	N/A	N/A	atlas	atlas	-
open ocean	available	1958 seasonal	N/A	N/A	1984-85 seasonal	1992-93 twice	Spring & Summer
	collected	-	N/A	N/A	atlas	atlas	-
Benthos							
local	available	N/A	N/A	N/A	N/A	N/A	N/A
	collected	N/A	N/A	N/A	N/A	N/A	N/A
coastal	available	1958 seasonal	N/A	N/A	1984-85 seasonal	++	Spring & Summer
	collected	-	N/A	N/A	atlas	atlas	-

		before 1960	**1960's**	**1970's**	**1980's**	**1990's**	**2000's**
open ocean	available	1958 seasonal	N/A	N/A	1984-85 seasonal	++	Spring & Summer
	collected	-	N/A	N/A	atlas	atlas	-
HAB							
local	available	N/A	N/A	yes	yes	yes	yes
	collected	N/A	N/A	yes	yes	yes	yes
coastal	available	N/A	N/A	yes	yes	yes	yes
	collected	N/A	N/A	yes	yes	yes	yes
open ocean	available	N/A	N/A	N/A	N/A	N/A	N/A
	collected	N/A	N/A	N/A	N/A	N/A	N/A

Annex IV

Status Indices

Phytoplankton	diatom/dinoflagellate (species number)
	species richness
	dominant species (up to 3 top species)
Zooplankton	total biomass (wet wt)
	% composition of abundance of 4 major groups
Benthos	biomass (wet wt) for 3 major groups - Molluscs, Crustaceans, Polychaetes
	abundance (3 major groups) - Molluscs, Crustaceans, Polychaetes
HAB	area
	# events / yr
	duration
	causative species
	cell density (wherever data available)

Annex V

Final Equipment and Personnel Manifest for Co-operative Study Cruises – Ecosystem Group

Winter Cruise

	bacteria		Micro-zooplankton	phytoplankton					zooplankton	Misc
	abundance	production		abundance/water sample	net sample	pico/size fraction/chl	HPLC	production	net sample	
# stations	50	10	50	50	50	50	50	10	50	
Inter-comparison stations				10	10				10	
who (Chinese)	Xu Zongjun	Fang Xisheng	Song Hongjun	Sun Ping	Sun Ping	Wang Hongping	Xu Zongjun	Wang Hongping	Song Hongjun	Zhang Xuelei
who (Koreans)	Hyun Jung Ho	Hyun Jung Ho	Yang Eun Jin	Yoo Man Ho	Yoo Man Ho	Kim Sun Young	Roh Seung Mok	Ro, Seung Mok	Heo Seung	
equipments (China)	filtering apparatus				77um net	filtering apparatus	filtering apparatus, liquefied N storage		Chinese plankton Net (150, 505 um)	CTD
equipments (Korea)	filtering apparatus	incubator			net (60um)	filtering apparatus (vacuum pump)	filtering apparatus	incubator, filtering apparatus	NORPAC 330um net	

	bacteria		Micro-zooplankton	phytoplankton					zooplankton	Misc
	abundance	production		abundance/water sample	net sample	pico/size fraction/chl	HPLC	production	net sample	
expendables (China)	200 vials, 200 filters, preservatives		200 vials, glyceraldehyde	240 bottles, preservatives	60 bottles, preservatives	200 vials, 200 filters (5um) (GFF), screen (20um), preservatives	200 filters (GFF)	100 filters (GFF), C14	60 plastic bottles, formalin	
expendables (Korea)								thymidine		

Spring Cruise (in addition to items of Winter Cruise)

	Benthos		Sediment Core	Remarks
	grain size, organic matter	Benthos		
# stations	Dr. Hong will provide		5	
Inter-comparison stations				
who (Chinese)	1 more			
who (Koreans)	2 more			
equipments (China)	sampler and grab		Gravity sampler	
equipments (Korea)	Van Veen grab			end Feb. 06 - decide on equipment for benthos
expendables (China)				
expendables (Korea)				

Annex VI

Upcoming Activities in 2006

Consultant for Ecosystem Component's Regional Data and Information Synthesis

Description of Required Services

A consultant will be hired to carry out the main responsibility of preparing a regional synthesis report containing an assessment of national ecosystem data and information collected from China and Korea. The report should contain:

1) An assessment of the national ecosystem data and information collected from China and Korea, and the national reports;
2) A synthesis and summary of the national data and co-operative study cruise results to provide a regional picture of Yellow Sea ecosystem status, trends, and gaps (illustrated through appropriate tables and graphics);
3) Recommendations to fill the gaps; and
4) Present the results in a draft write-up for the Ecosystem Chapter of the TDA.

Qualifications:

The incumbent should have the following qualifications:

- At least 15 years proven track record in the area of coastal and marine ecosystem management and/or research.
- Strong natural science background with knowledge of marine ecosystem management and policies.
- Familiarity with regional marine ecosystem research institutions and management agencies.
- Familiarity with working in the region.
- Good interpersonal skills, and ability to liaise with governments, relevant research institutions, and relevant data centres in the region.
- Proficiency in English.

Deliverables and Deadlines

The commissioned assignment should be carried out from January through July 2006, according to the following schedule:

Task	Deadline
Provide workplan to PMO	January 2006
Synthesis report	January – July 2006
Final report and financial statement	1 July 2006

Expected Outputs/Results

The final product should be a report following the suggested table of contents listed below.

SUGGESTED FINAL TABLE OF CONTENTS

I. Background of assignment
II. Methods used to carry out assignment
III. Regional synthesis of data and information
IV. Information gaps and recommendations to fill the gaps
V. Draft chapter for TDA
VI. Persons / institutions visited or interviewed

Consultant to Prepare Regional Guidelines for Monitoring Changes in the Ecosystem

A consultant will be hired to carry out the main responsibility of preparing regional guidelines for monitoring changes in ecosystem status. The report should contain:

1) A review and assessment of existing monitoring methods, and their pros and cons;
2) A list of parameters and/or indicators that may be used to monitor and detect changes in ecosystem status;
3) Recommendations on new ecosystem monitoring methodologies;
4) Recommendations on inter-calibration of sampling and analysis methodologies; and
5) Recommendations on managing and sharing ecosystem monitoring data.

Qualifications:

The consultant selected to carry out this task should have the following qualifications:

- At least 15 years proven track record in the area of coastal and marine ecosystem management and/or research.
- Strong natural science background with knowledge of marine ecosystem monitoring, management, and policies.
- Familiarity with ecosystem data management.
- Familiarity with working in the region.
- Good interpersonal skills, and ability to liaise with governments, relevant research institutions, and relevant data centres in the region.
- Proficiency in English.

The commissioned assignment should be carried out from July through December 2006.

Expected Outputs/Results

The final product should be a report following the suggested table of contents listed below.

SUGGESTED FINAL REPORT TABLE OF CONTENTS

I. Background of assignment
II. Methods used to carry out assignment
III. Review and assessment of existing monitoring methods
IV. Indicators to monitor changes in ecosystem status
V. Recommendations for new ecosystem monitoring methodologies
VI. Recommendations on sampling and analysis methodologies;
VII. Recommendations on managing and sharing ecosystem monitoring data

Annex VII

Revised Causal Chain Analysis – Ecosystem Component

Problem	Environmental Impacts	Socio-economic impacts	Immediate causes (technical)	Underlying causes	Root causes	Governance analysis	Legal data
Change in ecosystem structure	reduction in value of commercial fishery resources	loss in fisherman's income	pollution	refer to RWGP			refer to RWGP
	changes in benthic resources*	loss of aesthetic and recreational value for tourism	over harvesting	inc demand for fishery products, illegal fishing activities	refer to RWGF	inadequate fisheries management, enforcement of laws	refer to RWGF
		loss in fisherman's income	oceanographic conditions*	regional climate system*	climate change*		
	changes in biodiversity*	loss of aesthetic and recreational value for tourism	introduction of exotic species (refer RWGB)	inc in cargo traffic, introduced species for aquaculture (refer RWGB)		lack of ballast water regulation (national)?, regulations on exotic species	relevant national laws, regulations, articles, acts, strategies, plans
		loss of potential value of biological resources	Eutrophication (refer RWGP)	changes in land use patterns, insufficient treatment, increased use of fertilizers (refer RWGB, P)	population inc in coastal areas (se)	insufficient investment plans, lack of guidelines for agricultural practices, lack of appropriate development plans	"

Problem	Environmental Impacts	Socio-economic impacts	Immediate causes (technical)	Underlying causes	Root causes	Governance analysis	Legal data
	increased vulnerability to harmful marine organisms*	threats to human health	decreased freshwater input (se)	damming, diversion (se)	economic expansion (se)	inappropriate investment plans	"
		decrease in fisheries consumption			urbanisation		"
	increased vulnerability to perturbation**	increased management costs	Aquaculture (RWGF)	demand for fishery product (RWGF)	population, lifestyle (se)	refer to RWGF	"
Change in ecosystem productivity	deteriorating water quality	increased management costs	pollution	refer to RWGP			refer RWGP
		loss of aesthetic and recreational value for tourism	increased sediment input**	change in land use, construction (se)	increased demand for land (se)	lack of appropriate development plans	relevant national laws, regulations, articles, acts, strategies, plans
	source and sink capacity*	vulnerability to natural disasters	atmospheric deposition (RWGP?)**	natural and anthropogenic sources**	urbanisation, desertification (se)	lack of appropriate understanding of processes, insufficient investment	"
			change in nutrient availability & freshwater input (RWGP)	construction, damming, diversion (se)	economic expansion (se)	inappropriate investment plans	"
	fishery recruitment (RWGF)	loss in fisherman's income				inappropriate investment plans	"

Problem	Environmental Impacts	Socio-economic impacts	Immediate causes (technical)	Underlying causes	Root causes	Governance analysis	Legal data
		loss of employment	oceanographic conditions*	regional climate system*	climate change*	inadequate capacity in prediction and preparedness	"
Habitat modification	change in coastal landscape (RWGB)	loss of cultural resources	change in sediment input**	damming, diversion, construction activities on land (se)	pop, econ expansion (se)	lack of appropriate development plans	"
	loss of spawning and nursery grounds (RWGF)	loss in fisherman's income	sand extraction (se)	inc. in demand for construction materials (se)	pop, econ expansion (se)	insufficient enforcement, inappropriate management	"
	Biodiversity*	loss of aesthetic and recreational value for tourism	bottom trawling (RWGF)	inc. demand for demersal fish (RWGF)	refer to RWGF	insufficient enforcement	refer to RWGF
		loss of potential value of biological resources	coastal development (reclamation) (se)	inc land demand (se)	population, urbanisation, econ expansion (se)	lack of appropriate development plans	relevant national laws, regulations, articles, acts, strategies, plans
	habitat diversity	loss of aesthetic and recreational value for tourism					
		vulnerability to natural disasters					

Notes: thick lines around immediate and underlying causes show a one-to-one relationship between each immediate cause and its underlying cause.

*** Denotes data available from ecosystem group. **Denotes data may be available, and each team should try its best to look for it.**