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**UNDP/GEF PROJECT ENTITLED “REDUCING ENVIRONMENTAL STRESS IN THE  
YELLOW SEA LARGE MARINE ECOSYSTEM”**

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UNDP/GEF/YS/JC.1/3  
Date: 18 October 2005  
English only

**Technical Meeting for the Co-operative Study Cruises  
In the Yellow Sea Marine Basin  
For the UNDP/GEF Yellow Sea Project  
*Qingdao, China, 17-18 October 2005***

**Meeting Report**



## **1. OPENING OF THE MEETING**

### **1.1 Welcome addresses**

1.1.1 On behalf of the UNDP/GEF Yellow Sea project, the Project Manager, Mr. Yihang Jiang, opened the meeting and welcomed all participants to Qingdao, He briefly introduced the tasks that need to be discussed and resolved during the meeting to enable the undertaking of a successful co-operative study cruise between China and Korea. Mr. Jiang noted especially the attendance of the observers, some of which would participate in the survey cruise, and warmly welcomed them to the meeting.

### **1.2 Introduction of the members**

1.2.1 Participants of the Technical Meeting for the Co-operative Cruise were invited to introduce themselves and each gave a description of their involvement in the project. The list of participants is attached to this report as [Annex I](#).

## **2. ORGANISATION OF THE MEETING**

### **2.1 Election of Officers**

2.1.1 Mr. Huh Hyung-Tack of the National Project Co-ordinator, Korea nominated Mr. Yihang Jiang of the YSLME Project Management Office (PMO) for the position of Chairperson.

2.1.2 Mr. Zhu Wenxi of the Department of International Cooperation, State Oceanic Administration, China, seconded the nomination and Mr. Jiang was duly elected as Chairperson.

### **2.2 Documentation Available to the Meeting**

2.2.1 The Chairperson invited the Secretariat to introduce the documents prepared for the meeting.

2.2.2 Mr. Jeffrey Archer from the PMO introduced the list of documents (UNDP/GEF/YS/JC.1/inf1) and informed the meeting that the documents in front of them included the discussion documents; Workplan for the Co-operative Study Cruises in the Yellow Sea Marine Basin; Proposed Outcomes and Outputs of the Cooperative Study Cruises in the Yellow Sea Marine Basin; and three documents for Consideration of the Observation and Sampling Requirements for the Fishery, Ecosystem and Pollution Components; and informational documents including; General Information on the research vessel "Bei Dou". Also included in the documentation was the published copy of the report of the First Meeting of the Regional Scientific and Technical Panel.

## 2.3 Organisation of Work

- 2.3.1 Mr. Archer introduced the document UNDP/GEF/YS/JC.1/inf.3 describing the Provisional Working Programme for the meeting and noted that the meeting would be conducted in plenary as best as possible.
- 2.3.2 The Chairperson mentioned that sessional working groups may be required where necessary to address a number of the issues in the meeting, and that an informal brainstorming session was also required in the evening of 17 October 2005.

## 3. ADOPTION OF THE MEETING AGENDA

- 3.1 The Chairperson invited participants to consider the Provisional Agenda (Document UNDP/GEF/YS/JC.1/1) and Annotated Provisional Agenda (Document UNDP/GEF/YS/JC.1/2), prepared by the Secretariat, and to propose any amendments or additions that they might wish.
- 3.2 ***The meeting adopted*** the agenda with no modification, which is attached as [Annex II](#) to this report.

## 4. INTRODUCTION OF THE PLAN FOR CO-OPERATIVE STUDY CRUISES

### 4.1 Workplan of the Co-operative Study Cruises

- 4.1.1 The Project Manager introduced document UNDP/GEF/YS/JC.1/4, the Workplan for Co-operative Study Cruises in the Yellow Sea Marine Basin, prepared by the PMO and based on the discussions and agreements of the First Meeting of the Regional Scientific and Technical Panel (RSTP) of the project.
- 4.1.2 Mr. Jeffrey Archer presented a brief overview of the workplan, describing the agreed dates, the proposed route, sampling stations and transect locations, and the personnel allocations made for each working group that will be onboard during the survey.
- 4.1.3 Mr. Zhu Wenxi informed the group that in accordance with the relevant regulations of the People's Republic of China (PRC), approval of the co-operative study cruise is required 6 months before the initiation of any cruise. He further informed the meeting that the approval process has been started with several of the required ministries. He cautioned that if the cruise plan was changed dramatically it may affect, and thus delay, the approval process.
- 4.1.4 The Chairperson voiced his appreciation for this information and asked all meeting participants to keep this in mind during the discussions. He mentioned his hope that there would be a possibility of some adjustments in the approval process should a small change in the survey cruise plan be necessary. He added that by his knowledge a change in the survey's Chief Scientist or the parameters to be surveyed can affect the approval process.
- 4.1.5 Mr. Yoo Sinjae added that Korea most likely has the same approval policy and highlighted the urgency to consider also the spring cruise now due to the lack of time before this survey takes place.

4.1.6 The meeting discussed and agreed that the spring cruise is considered concurrently with the winter survey cruise and government approvals are sought simultaneously.

#### **4.2 Expected Outputs and Outcomes of the Cruises**

4.2.1 The Chairperson invited the secretariat to introduce this agenda item referring to document UNDP/GEF/YS/JC.1/5.

4.2.2 Mr. Jeffrey Archer gave a brief overview of the outcomes and outputs expected from the cooperative survey cruise by the YSLME Project. He stated that the overall outcomes included acquiring a better understanding of the status and conditions of the Yellow Sea Marine basin ecosystem, the condition and quality of the Yellow Sea marine basin habitat and the biological and physical dynamics of the Yellow Sea marine basin system. More specifically the data/information collected from both surveys will allow the project to determine status and changes in benthic and pelagic resources, quality and availability of bottom and pelagic habitats, abundance and distribution of organisms in the Yellow Sea marine basin, status of marine pollution and water quality in the Yellow Sea marine basin; and provide us with basic basin-wide information on the marine environment of the Yellow Sea. This data/information will allow us to identify trends, and/or predict changes under prevailing ecosystem conditions and identify or prioritise interventions for the SAP phase of the project.

4.2.3 He went on to describe the ultimate outcomes of the cooperative cruise which included: regionally agreed methods for observation, monitoring and sampling of marine environmental parameters in the Yellow Sea; an enhanced co-operative mechanism for regional marine environment monitoring and observation; upgraded skills in basin-wide observation and monitoring; a better scientific understanding of the basin-wide marine environment/ecosystem status; identification of data/information and knowledge gaps; and an increased mutual understanding and trust amongst the participating institutions.

4.2.4 Finally Mr. Archer summarised the expected outputs of the survey which included the data and reports as a result of the survey activities, recommendations and items to be addressed for the next survey in spring, and a preliminary analysis of collected data.

4.2.5 ***The meeting discussed and noted*** the expected outcomes and outputs of the cooperative study cruise.

#### **5. STATUS REPORT ON GOVERNMENT APPROVAL FOR THE CO-OPERATIVE STUDY CRUISES PLAN**

5.1 The Chairperson invited the National Project Co-ordinators (NPCs) to provide information on the status of government approval for the co-operative study cruises, based on the workplan provided by the PMO to the NPCs.

5.2 Mr. Zhu Wenxi, as representative of the NPC for China, reported that the NPC had reviewed the draft cruise plan provided by the PMO and that the same plan had been distributed to other scientists from their advisory body for foreign related activities for

their review. He informed the meeting that a comment from the advisory body on the plan may be made within two weeks and that assured the group that they will try to expedite the approval process and avoid any great change in plans. He urged again for the group to finalise the cruise plan without any big changes to ensure a swift approval process. He further recommended that focal institutes and chief scientists be nominated as a requirement for the approval.

5.3 Mr. Huh Hyung-Tack as NPC for Korea reported that the status is similar in Korea in that the proposal had been submitted to the Ministry of Maritime Affairs and Fisheries (MOMAF) in Korea, and was distributed to various institutions for review. A meeting was called with various experts relevant to the activity, and a slightly modified plan of the cruise was prepared as a result and will be presented today for the consideration of the group. He further mentioned that there is little time left for the approval process but may still be possible.

5.4 **The meeting noted** the reports made by the NPCs.

## 6. CONSIDERATION OF TECHNICAL ISSUES FOR THE CO-OPERATIVE STUDY CRUISES

6.1 The Chairperson invited the Chairpersons of the Regional Working Groups (RWGs) for Fisheries, Ecosystem and Pollution to present the requirements for their respective RWGs for the winter and spring co-operative study cruises including requirements for transects and sampling stations, observation and sampling, data and other technical issues.

6.2 The Chairperson invited the group to discuss the sampling stations plan first, and noted the agreement reached at the RSTP meeting regarding the distribution of stations; however adjustments could be made to this during the meeting. He mentioned that the members should keep in mind the requirements of the approval process for the cruises.

6.3 **The members of the Fisheries, Ecosystem and Pollution groups discussed** their sampling station requirements **and collectively agreed** to add 4 more environmental stations to cover their combined spatial requirements.

6.4 The meeting then considered the working time of the cruise, and felt that the cruise time required for the agreed observation stations will be too long. **The meeting discussed and agreed** to reduce several stations.

6.5 Following extensive discussion on the observation stations, **the meeting agreed on** changes to the proposed winter cruise that were not substantively different compared to the plan agreed by the RSTP. **The meeting also discussed and agreed upon** the survey plan of the spring cruise. The final agreed observation areas and stations for both winter and spring is provided in Annex III.

6.6 The meeting then considered the logistical requirements for the various components participating in the co-operative study cruises and constructed a table indicating: the samples that were required; the equipment necessary; provided names for the personnel responsible for the function of the equipment during the cruise; and highlighted the equipment needed to be purchased. **The meeting agreed** to examine ways to facilitate the acquisition of equipment that was lacking, and in consideration of the time limitation. The summary table for all component requirements is attached as Annex IV.

- 6.7 The Project Manager stated that the data would remain property of GEF, with the principle and understanding that the data will be shared equally between the participating countries. In order to implement this principle, in particular to allow the relocation of the samples to Korea, there is need to get approval from the respective governmental agencies; according to the Chinese Government regulation, the approval shall be on a case-by-case basis.
- 6.8 Mr. Zhu Wenxi suggested that the PMO provide a detailed list of sample types that are required to be relocated to Korea as soon as possible, to seek approval from the government agency.
- 6.9 The Project Manager stated that in order to have better guidelines in the future for data management and sharing for the project, the PMO will prepare a policy paper and present it to the next Project Steering Committee for consideration and approval, as requested by the RSTP at its first meeting.
- 6.10 The Chairperson then asked the group to discuss and develop budgets for the cruise activities adding that they should include equipment, post-cruise sampling transportation and analysis costs, expendables and non-expendable costs and hardship allowance and travel costs for the participating scientists.
- 6.11 The Project Manager also informed the group that that equipment purchased by the Project using GEF funds will be considered the property of UNDP.
- 6.12 Mr. Wang Qixiang described the budget requirements as it related to the Biodiversity component, describing the need to survey both seabirds and marine mammals during the cruise. Mr. Wang, on behalf of the Chinese biodiversity group cited the budget required to undertake the survey of the above animals during the cruise. **The meeting considered** the budget and no major issue was raised at that point based on the understanding that further consultation with Korea was required.
- 6.13 The Chairperson emphasised to the group that this was only the consideration of the Chinese side and further consultation and agreement with the Korean side, and the Chairperson of the Regional Working Group for Biodiversity, was required, and that there may be some adjustments to the budget needed as a result. Mr. Wang Qixiang stated that he would endeavour to do this after the meeting and would seek the assistance of the Korean NPC to obtain an agreement.
- 6.14 Mr. Yoo Sinjae presented the combined-country budget requirements for the Ecosystem component, and described the elements for this component. **The meeting discussed** the thorough budget arrangement and **there were no major concerns.**
- 6.15 Mr. Jin Xianshi presented the budget arrangement for the Fisheries component. There was some discussion on the elements of the budget in particular on possible double-up of costs in some of the item lines referring to sample analysis and non-standard use of line item descriptions.
- 6.16 Mr. Oh Jae Ryoung presented the budget for the Pollution component, and described the costs associated with the treatment and analysis of samples based on the number of agreed sampling stations in the cruise plan. **The meeting considered** this and **there was no disagreement** based on the understanding that the costs may change in relation to the final number of sampling stations (and therefore samples) that will be agreed upon.

- 6.17 **The meeting further considered** the financial arrangement for the co-operative study cruise, to be considered in preparation of the respective contracts and **agreed** detailed budget breakdowns to the PMO at the close of the session. These are attached in Annex V.

## 7. LOGISTICAL ARRANGEMENTS FOR THE CO-OPERATIVE STUDY CRUISES

- 7.1 The Chairperson invited Dr. Jin Xianshi of the Yellow Sea Fisheries Research Institute to present general information about the research vessel “Bei Dou”, and other relevant information about the winter cruise.
- 7.2 Mr. Jin Xianshi described the details on the preparation of the research vessel, preparation of necessary equipment, transport of equipment and personnel, and the function and responsibilities of scientists on-board. He also described the general conditions of the boat and the equipment and facilities available for personnel.
- 7.3 **The meeting expressed** its appreciation to Dr. Jin for the information and arrangement, which will make the co-operative cruises possible and successful.

## 8. WORKPLAN FOR PREPARATION OF THE CO-OPERATIVE STUDY CRUISES

- 8.1 The Chairperson invited Mr. Jeffrey Archer to give, as an example, a presentation of the draft workplan, relating to the preparation of the winter study cruise for each component, including a schedule of activities that will follow the cruise.
- 8.2 **The meeting discussed**, made additions/modifications to the draft workplan in Microsoft Project format, and **agreed** the workplan, which is attached in Annex VI. A GANTT chart of combined activities is attached in Annex VII.
- 8.3 Mr. Yoo Sinjae suggested that an extra Technical Meeting for the Co-operative Survey Cruises be held after the completion of the first cruise, and before the initiation of the second to facilitate the organisation, and quality of, the second co-operative study cruise .
- 8.4 The Project Manager proposed the months of March to April as a good time for such a meeting. **The meeting agreed** to this and the PMO will make the necessary arrangements for the meeting.

## 9. OTHER BUSINESS

- 9.1 The Chairman invited members to raise any other issues that need to be considered by this meeting.
- 9.2 **The meeting unanimously elected** Mr. Jin Xianshi as Chief Scientist by the meeting for the winter cruise. The meeting agreed that the Chief Scientist should have authorisation and flexibility during the cruise, based on the agreed workplan. Necessary adjustments would be made by the Chief Scientist during the cruise according to the weather and other conditions.
- 9.3 Mr. Zhu Wenxi asked the meeting to provide the names of the Chief Scientist from Korea for the co-operative cruise.



- 9.4 Mr. Yang-Jae Im was nominated as the Chief Scientist of the Korean group to be on-board the research vessel. He will act as contact person for Korea during the entire cruise.

## 10. ADOPTION OF THE MEETING REPORT

- 10.1 **The report was** considered paragraph by paragraph and **adopted** as contained in this document.
- 10.2 The Chairman moved the formal motion for the adoption of the report of the First Technical Meeting for the Co-operative Study Cruises of the YSLME which was passed by acclamation.

## 11. CLOSURE OF THE MEETING

- 11.1 The Chairperson thanked the participants of the meeting, the Project Manager, PMO staff and observers for their hard and constructive work.
- 11.2 On behalf of all participants, the Project Manager thanked Mr. Jin for the arrangements of the meeting that ensured its success.
- 11.3 Mr. Oh Jae Ryoung gave his thanks to Mr. Jin Xianshi for the arrangements of the meeting that he and his institute made. He also gave thanks to all who helped in the operation of the meeting and voiced his best wishes for the progress of the project for the future.
- 11.4 The meeting was formally closed at 17:00 hrs, October 18<sup>th</sup>, 2005.



## Annex I

## List of Participants

<p><b>Mr. HUH Hyung-Tack</b>  Dept. of Oceanography  Sr. Scientist Emeritus, KORDI  Fellow, Korean Academy Of Science &amp; Technology, Chairman, IOC/WESTPAC  253, Yonghyun-Dong, Nam-Gu  Incheon 402-751  Tel: 82-31-400-6201  Fax: 82-31-408-5934  Email: <a href="mailto:hthuh@kordi.re.kr">hthuh@kordi.re.kr</a></p>	<p><b>Mr. WEN Quan</b>  SOA Key Lab of Coastal Ecosystem and Environment Research  National Marine Environment Monitoring Centre  42 Linghe Street  Dalian 116023  Tel: 86-411-8478-2522  Fax: 86-411-8478-2522  Email: <a href="mailto:gwen@nmemc.gov.cn">gwen@nmemc.gov.cn</a></p>
<p><b>Mr. JIN Xianshi</b>  Fishery Biologist  Director of Fishable Resources &amp; Ecosystem Management Division  Yellow Sea Fisheries Research Institute  106 Nanjing Road, Qingdao 266071  Tel: 86-532-584-9430/583-6344  Fax: 86-532-581-1514  Email: <a href="mailto:jin@ysfri.ac.cn">jin@ysfri.ac.cn</a></p>	<p><b>Mr. YOO Sinjae</b>  Senior Research Scientist  Marine Living Resources Research Division  Korean Ocean Research and Development Institute  1270 Sa-dong Sangnok-gu Ansan-si  Gyeonggi-do 426-744, Republic of Korea  Tel: 82-31-400-6221  Fax: 82-31-408-5934  Email: <a href="mailto:sjyoo@kordi.re.kr">sjyoo@kordi.re.kr</a></p>
<p><b>Mr. OH Jae Ryoung</b>  Head  Marine Environmental Risk Assessment Research Division  South Sea Institute - Korea Ocean Research and Development Institute (KORDI)  391 Jangmok-ri, Jangmok-myon  Geoje, Gyungnam, 656-830  Republic of Korea  Tel: 82-55-639-8670  Fax: 82-55-639-8689  Email: <a href="mailto:jroh@kordi.re.kr">jroh@kordi.re.kr</a></p>	<p><b>Mr. Zhang Xuelei</b>  Associate Professor  First Institute of Oceanography, SOA  6 Xianxialing Road Hi-Tech Industrial Park  Qingdao, 266061  Tel: 86-532-896-7447  Fax: 86-532-896-7447  Email: <a href="mailto:zhangxl@fio.org.cn">zhangxl@fio.org.cn</a></p>
<p><b>Ms. YEON In Ja</b>  Senior Scientist  West Sea Fisheries Research Institute  National Fisheries Research &amp; Development Institute (NFRDI)  707, Ulwang-dong, Jung-gu, Incheon,  400-420, Republic of KOREA  Tel: 82-32-745-0551  Fax: 82-32-745-0549  Email: <a href="mailto:ijyeon@nfrdi.re.kr">ijyeon@nfrdi.re.kr</a></p>	<p><b>Mr. Zhu Wenxi</b>  Department of International Co-operation  State Oceanic Administration  1 Fuxingmenwai Avenue  Beijing 100860  Tel: 86-6804-8051  Fax: 86-106803-0799  Email: <a href="mailto:wzxzhu@soa.gov.cn">wxzhu@soa.gov.cn</a></p>

<b>Observers</b>	
<p><b>Mr. Chen Shang</b>  Research Professor  First Institute of Oceanography  State Oceanic Administration  6 Xianxialing, Qingdao  Shangdong Province, 2660061  P.R. China  Tel: 86-532-8896-7476  Fax: 86-532-8896-7447  Email: <a href="mailto:schen@fio.org.cn">schen@fio.org.cn</a></p>	<p><b>Mr. WANG Qixiang</b>  First Institute of Oceanography  State Oceanic Administration  6 Xianxialing, Qingdao  Shangdong Province, 2660061  P.R. China  Tel: 86-532-8896-7447  Fax: 86-532-8896-7447  Email: <a href="mailto:wqxbx@163.com">wqxbx@163.com</a></p>
<p><b>Mr. XU Zongjun</b>  First Institute of Oceanography  State Oceanic Administration  6 Xianxialing, Qingdao  Shangdong Province, 2660061  P.R. China  Tel: 86-532-8896-7447  Fax: 86-532-8896-7447  Email: <a href="mailto:xzj@fio.org.cn">xzj@fio.org.cn</a></p>	<p><b>Ms. SUN Ping</b>  First Institute of Oceanography  State Oceanic Administration  6 Xianxialing, Qingdao  Shangdong Province, 2660061  P.R. China  Tel: 86-532-8896-7447  Fax: 86-532-8896-7447  Email: <a href="mailto:Sharry_cn@hotmail.com">Sharry_cn@hotmail.com</a></p>
<b>Project Management Office (PMO)</b>	
<p><b>Mr. Yihang JIANG</b>  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: <a href="mailto:yihang@yslme.org">yihang@yslme.org</a></p>	<p><b>Mr. Jeffrey ARCHER</b>  Fisheries 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: 82-31-400-7832  Fax: 82-31-400-7826  Email: <a href="mailto:jeff@yslme.org">jeff@yslme.org</a></p>

## **Annex II**

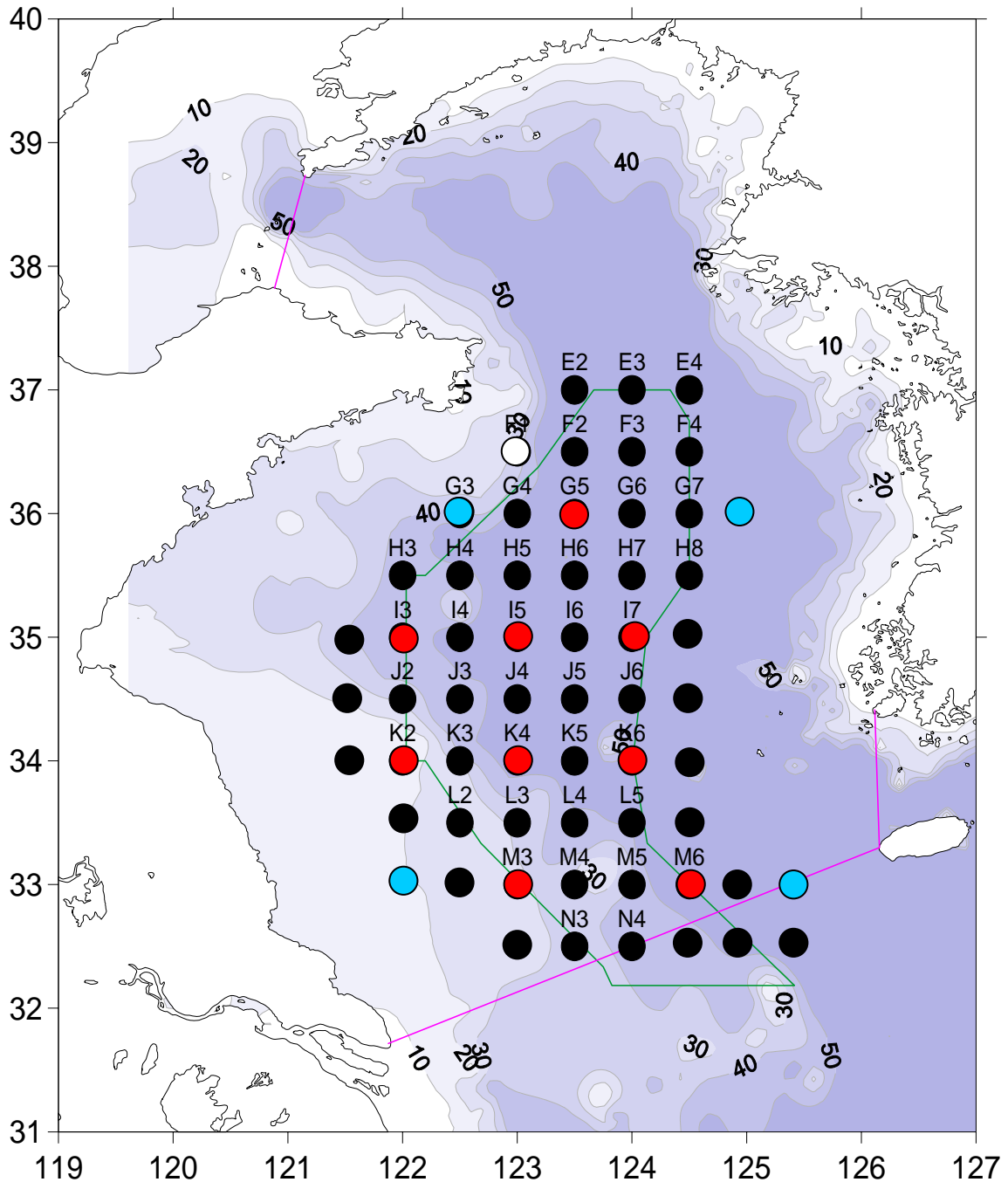
### **Agenda**

- 1. OPENING OF THE MEETING**
- 2. ORGANISATION OF THE MEETING**
  - 2.1 Election of Officers
  - 2.2 Documentation Available to the Meeting
  - 2.3 Organisation of Work
- 3. ADOPTION OF THE MEETING AGENDA**
- 4. INTRODUCTION OF THE PLAN FOR CO-OPERATIVE STUDY CRUISES**
  - 4.1 Workplan of the Co-operative Study Cruises
  - 4.2 Expected Outputs and Outcomes of the Cruises
- 5. STATUS REPORT ON GOVERNMENT APPROVAL FOR THE CO-OPERATIVE STUDY CRUISES PLAN**
- 6. CONSIDERATION OF TECHNICAL ISSUES FOR THE CO-OPERATIVE STUDY CRUISES**
  - 6.1 Observation Area/Route, Transect and Sampling Stations
  - 6.2 Observation and Sampling requirements for the Fishery Component
  - 6.3 Observation and Sampling requirements for the Ecosystem Component
  - 6.4 Observation and Sampling requirements for the Pollution Component
  - 6.5 Data Analysis: Methods, Quality and Comparison of Final Results
  - 6.6 Other Technical Issues
- 7. LOGISTICAL ARRANGEMENTS FOR THE CO-OPERATIVE STUDY CRUISES**
  - 7.1 Preparation of Research Vessel
  - 7.2 Preparation of Necessary Equipment
  - 7.3 Consideration of Scientists On-board and Their Responsibilities
  - 7.4 Transportation of Equipment and Personnel
  - 7.5 Other arrangements
- 8. WORKPLAN FOR PREPARATION OF THE CO-OPERATIVE STUDY CRUISES**
- 9. OTHER BUSINESS**
- 10. ADOPTION OF THE MEETING REPORT**
- 11. CLOSURE OF THE MEETING**



### Annex III Agreed Locations of Sampling Stations.

#### WINTER CRUISE

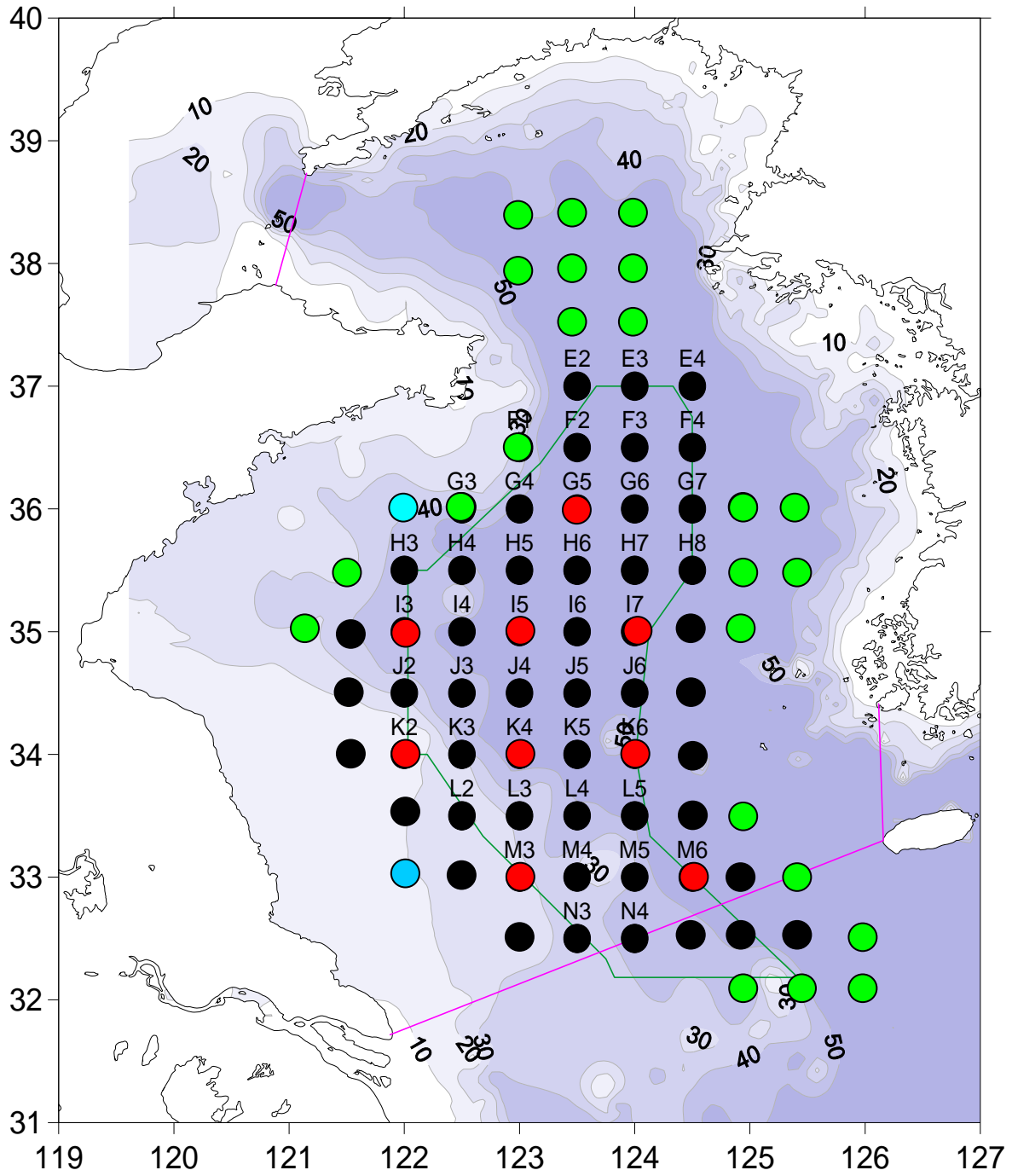


— Yellow sea boundary

Total 50 stations

- = Environmental Stations Only
- = Deleted stations
- = Previously deleted station

### SPRING CRUISE



— Yellow sea boundary

**Total 71 stations**

- = Environment stations only
- = Deleted Stations
- = Additions
- = existing winter agreements



## Annex IV

### Logistical Requirements

Note: Shaded areas refer to equipment that is required to be purchased before, or for the cruise.

	SAMPLING ACTIVITY	EQUIPMENT REQUIRED	ASSOCIATED PERSONNEL
<b>Fisheries</b>	Bottom Trawl	Y,2 (X size), 1 net (X size)	Jin,Xianshi, Fangqun Dai, Jianming Sun, Ruisheng Chen, Yang Jae Im, Jung Hwa Choi
	Pelagic Trawl	Y,1 (X size)	
	Acoustic sampling	Y, SIMRAD EK500, 38 kHz	Zhao,Xianyong, Seok Gwan Choi
	Biological sampling	Y, 2 , Electric balances,sensitivity 0.1g,0.01 g, measuring board	
	Ichthyoplankton netting	Y, 2 Bongo nets (X microns), 4 Horizontal netting	Wan, Ruijing, Hak Jin Hwang, Jin Koo Kim
<b>Ecosystem</b>	<b>Bacterial Productivity and Abundance</b>		
	Bacterial abundance	Cytometer	Zongjun Xu
	Bacterial productivity	Thymidine incubation	Xisheng Fang
			Jung Ho Hyun
	<b>Micro-zooplankton</b>		
	Abundance	Microscope	Eun Jin Yang
	Grazing	Incubation & counting	Hyu Chang Choi
	<b>Phytoplankton productivity and abundance</b>		
	Net samples (china needs calibration), water samples, pico-phytoplankton	Net, water samples, cytometer	Hongping Wang
	HPLC	HPLC, filtering apparatus, Liquified nitrogen storage	Ping Sun
	P-E incubation	Incubation apparatus	Xuelei Zhang
	Chlorophyll-a (& phaeo- pigments)	Filtering apparatus and fluorometer	Roh Seung Mok
	<b>Zooplankton</b>		
	Abundance, biomass (505, China) (330?, Korea)		Hongjun Song
	Inter-comparison		Heo Seung,Shon Jae Kyoung
	<b>CTD + Rosette samples</b>	Submersible Fluorometer, PAR sensor, transmissometer (Beam attenuation), DO sensor	Xuelei Zhang
	Light (Spectral light)	Spectro-radiometer, PAR sensor	
<b>Pollution</b>	<b>Routine Parameters</b>		
	Temperature	CTD sensor	No name given

	<b>SAMPLING ACTIVITY</b>	<b>EQUIPMENT REQUIRED</b>	<b>ASSOCIATED PERSONNEL</b>
	Salinity	CTD sensor	No name given
	pH	pH sensor	No name given
	Transparency	Turbidity meter	No name given
	DO	DO sensor, Titrator, magnetic stirrer, sample bottles	No name given
	COD	Sample bottle	No name given
	SS	SS sensor	No name given
	Chlorophyll a	Chlorophyll a sensor, Fluorescence sensor	No name given
	<b>Nutrients</b>		
	Nitrate	Technicon, FIA, UV-Vis Spec	No name given
	Nitrite		No name given
	Ammonium		No name given
	Phosphate		No name given
	Silicate		No name given
	<b>Organic Pollutants</b>	Sampler and sample bottles, acid, filtration system, shaker, separatory funnels, glass bottle	Jiang Yuewen
	<b>Heavy metals</b>	Sampler, sample bottles, acids, filtration system, LDPE or Teflon bottles	He Guangkai, Na Guangshui, Un Hyuk Yim, Sung Young HA, Pan Soo Park
Biodiversity	<b>Marine Mammals</b>	Digital video recorder, telescope	Qixiang Wang
	<b>Seabirds</b>	Digital video recorder, telescope	Qixiang Wang

## Annex V

### Budget Summary by Component

#### A. Fisheries Component

Budget Item	Unit cost (USD)	Units	Subtotal	Purchase country	Budget Distribution	
					China	Korea

#### Prepare for Joint Survey

Prepare reagents and chemicals for analyses	10.00	300.00	3,000.00	China	100%	
Bottles and fish boxes and baskets	15.00	300.00	4,500.00	China	100%	
Dissection tools and measuring boards	50.00	40.00	2,000.00	China	100%	
Meeting in each nation	140.00	20.00	2,800.00	Korea, China	50%	50%
Transportation for scientists	650.00	5.00	3,250.00	Korean	100%	
Prepare unified methods and standards	110.00	20.00	2,200.00	Korean&Chinese	45%	55%
Adjust in situ instruments and devices	500.00	2.00	1,000.00	China	100%	
<b>Subtotal</b>			<b>18,750.00</b>			

<b>Hardship allowance</b>	<b>30.00</b>	<b>210</b>	<b>6,300.00</b>		<b>50%</b>	<b>50%</b>
			<b>6,300.00</b>			

#### After survey

Improve analytical procedures and methods	650.00	5.00	3,250.00	Korean scientists		100%
Processing of biological specimens in Lab.	70.00	120.00	8,400.00	In China	50%	50%
Acoustic estimation and preparing data in Lab.	110.00	30.00	3,300.00	In China	60%	40%
Cost of energy and Lab.	50.00	15.00	750.00	In China	100%	
Preparing cruise report meeting	110.00	38.00	4,180.00	In Korea	60.0%	40.0%
Air tickets	650.00	2.00	1,300.00	Chinese scientists	100%	
Meeting in each nation	140.00	20.00	2,800.00	Korea, China	50%	50%
Stomach contents analysis	60.00	30.00	1,800.00	In China and Korea	50%	50%
Identification of egg and larvae	60.00	30.00	1,800.00	In China and Korea	50%	50%
Move all facilities and devices to Institutions in Korea and China	30.00	100.00	3,000.00	Korean & Chinese	10%	90%
Data analysis	60.00	30.00	1,800.00	In China and Korea	50%	50%
Preparing the survey results report	110.00	36.00	3,960.00	In China and Korea	50%	50%
<b>Subtotal</b>			<b>36,340.00</b>			

#### Equipment (Purchase and transport)

Electronic balances	4,500.00	2.00	9,000.00	(sensitivity 0.1g,0.01 g)	100%	
Ichthyoplankton nets	3,500.00	2.00	7,000.00	2 Bongo, 4Horizontal nets	100%	
			<b>16,000.00</b>			

**Total** **77,390.00**

**B. Pollution Component**

Item			China			Korea			Total			Remarks
			Unit Cost (US \$)	Units	Sub-total	Unit Cost (US \$)	Units	Sub-total	Unit Cost (US \$)	Units	Sub-total	
Cost of samples analysis in laboratory	<b>Water column</b>	metals	100	25	2,500	100	25	2,500	<b>100</b>	<b>50</b>	<b>5,000</b>	Cu, Pb, Zn, Cd, Cr, Hg and As
		TOC	20	50	1,000	20	50	1,000	<b>20</b>	<b>100</b>	<b>2,000</b>	
		TPH	20	25	500	20	25	500	<b>20</b>	<b>50</b>	<b>1,000</b>	
		PAHs	150	50	7,500	150	50	7,500	<b>150</b>	<b>100</b>	<b>15,000</b>	
		PCBs	150	50	7,500	150	50	7,500	<b>150</b>	<b>100</b>	<b>15,000</b>	
		OCPs	150	50	7,500	150	50	7,500	<b>150</b>	<b>100</b>	<b>15,000</b>	
Analysis of nutrients			80	75	6,000	80	75	6,000	<b>80</b>	<b>150</b>	<b>12,000</b>	5 nutrients
Analysis of Organics	<b>Biota</b>	PAHs	220	15	3,300	220	15	3,300	<b>220</b>	<b>30</b>	<b>6,600</b>	
		PCBs	220	15	3,300	220	15	3,300	<b>220</b>	<b>30</b>	<b>6,600</b>	
		OCPs	220	15	3,300	220	15	3,300	<b>220</b>	<b>30</b>	<b>6,600</b>	
Analysis of Metals	<b>Biota</b>	metals	100	15	1,500	100	15	1,500	<b>100</b>	<b>30</b>	<b>3,000</b>	
Communication (including phone and cable) cost					150			150			<b>300</b>	
Filtration membrane			9	20	180	3	20	60	<b>20</b>	<b>12</b>	<b>240</b>	Acetate Fiber Filter
Filtration membrane			100	5	500			0	<b>100</b>	<b>5</b>	<b>500</b>	Glass Fiber Filter(options, if the online water analyzer with Chl a sensors, this item may be deleted)
Hardship allowance			30	90	2,700	30	90	2,700	<b>30</b>	<b>180</b>	<b>5,400</b>	6 persons, 30 days,per person
Personnel transportation costs		China	200	3	600				<b>200</b>	<b>3</b>	<b>600</b>	3 persons 1 round trips (Dalian-Qingdao-Dalian)
		Korea				450	3	1,350	<b>450</b>	<b>3</b>	<b>1,350</b>	3 persons 1 round trips (Korea-Qingdao-Korea)

Item		China			Korea			Total			Remarks
		Unit Cost (US \$)	Units	Sub-total	Unit Cost (US \$)	Units	Sub-total	Unit Cost (US \$)	Units	Sub-total	
Equipment transportation costs	China	350	1	350				350	1	350	spectrometer, sensor, pH meter, sampler, samples containers, 1 round trips (Dalian-Qingdao-Dalian)
	Korea				500	1	500	500	1	500	1 round trips (Korea - Qingdao-Korea)
Samples transportation costs	China	450	1	450				450	1	450	deliver samples to laboratories, once per cruise
	Korea				750	1	750	750	1	750	deliver samples from Qingdao to Korean laboratories, once per cruise
PC Software		300	2	600				300	2	600	
<b>Grant Total</b>				<b>49,430</b>			<b>49,410</b>			<b>98,840</b>	

**C. Ecosystem Component**

Budget Item	Budget Distribution		Row Totals
	China	Korea	
<b>Purchase</b>	5,300	4,375	9,675
<b>Analysis</b>	14,400	2,000	16,400
<b>Expendables</b>	6,160	1,000	7,160
<b>Eq. +sample transport</b>	120	4,000	4,120
<b>Insurance</b>	840	2,600	3,440
<b>After-cruise salary</b>	18,000	18,000	36,000
<b>Personnel travel</b>	90	7,000	7,090
<b>Hardship allowance</b>	3,600	3,600	7,200
<b>Subtotal</b>	<b>48,510</b>	<b>42,575</b>	
<b>Total</b>			<b>91,085</b>

**D. Biodiversity Component**

Budget Item	Units	Number of Units	Budget Distribution	
			China	Korea
<b>Hardship</b>	30	22	660	No info
<b>Equipment</b>				No info
Purchase	0	0	0	No info
Transport	0	0	0	No info
Expendibles	0	0	0	No info
DVD-disc	2.5	100	250	No info
Non-expendibles	0	0	0	No info
Digital video camera	1650	1	1,650	No info
Telescope	540	1	540	No info
Tripod	50	1	50	No info
<b>Personnel Travel</b>	0	0	0	No info
<b>After Cruise Costs</b>	0	0	0	No info
Image&Date Analysis			2,300	No info
Report draft			460	No info
<b>Total</b>			<b>5,910</b>	No info

## Annex VI

### Workplan for the Cooperative Cruise Survey

The following are the proposed workplans as contributed by the different components (with the exception of Biodiversity):

#### A. Ecosystem Component

ITEM		DESCRIPTION	TIMELINE
1		Begin procurement of equipments	End of Oct
2		Meetings of National Working Group for Ecosystem	
	Meeting	Discuss and agree on the detailed methods and sampling plan.	by Nov 24
3		Meetings of Regional Working Group for Ecosystem	
	Meeting	Discuss and agree on the detailed methods and sampling plan.	by Dec 2
4		Procure expendables	
	Meeting 1:	Discuss and agree on the detailed methods and sampling plan.	by Dec 10
5		prepare for the cruise on-board Bei-Dou	Jan1-3
6		Collecting samples and other information ?Conduct basin-scale surveys specifically targeting bacterioplankton, phytoplankton, zooplankton, and benthos	
7		Sample and data analysis	Within 3 months after the cruise
8		Visit of Korean scientist to China for sample analysis	Within 2 months after the cruise
9		Assessment of current productivity and structure in the lower trophic level	
	Meeting 2:	Synthesize the results from different levels and discuss how to make an overall assessment.	Within five months after the cruise

**B. Fisheries Component**

DESCRIPTION	TIMELINE
<b>Prepare for Joint Survey</b>	Sept.- Dec.31
Prepare reagents and chemicals for analyses	Sept.- Dec.31
Bottles and fish boxes and baskets	Sept.- Dec.31
Dissection tools and measuring boards	Sept.- Dec.31
Transportation for scientists	Jan.3
Prepare unified methods and standards	Jan.3
Adjust in situ instruments and devices	Jan.4
<b>After survey</b>	
Improve analytical procedures and methods	Feb. 25-Mar 27
Processing of biological specimens in Lab.	Feb. 28-Mar.26
Preparing cruise report meeting	Mar.28-April 7, 3days
Air tickets	Mar.28-April 7, 4days
Stomach contents analysis	Mar.7-April 7
Identification of egg and larvae	Mar.7-April 7
Move all facilities and devices to Institutions in Korea and China	Mar. 28
Data analysis	Mar.7-April 7
Preparing the survey results report	April 15-30

**C. Pollution Component**

	DESCRIPTION	TIMELINE
1	Refine the workplan	Aug – Sep of 2005:
	Prepare the agents and chemicals for analyses	
	Prepare the methods and standards	
2	Participate inter calibration exercise among the laboratories (if possible)	Oct – Dec of 2005:
	Summarize the results from inter-calibration exercise	
3	Improve the analytical procedures and methods	Nov of 2005
	Prepare devices and storage bottles	
	Prepare all the standards and reagents	
	Decide the data format and recording tables	
4	Adjust in-situ instruments, devices or samplers	Dec of 2005:
	Move all facilities and devices to Qingdao	
5	Implement the co- survey plan	Jan of 2006:
	Separate samples and deliver to different labs	
6	Analyses all samples in land-based labs	Feb – April of 2006:
	Process data	
	Exchange data	
	Discuss the findings or issues	
	Analyses data	
7	Final report on first joint survey with data set and preliminary analysis	May of 2006:
	Reporting	



## **Annex VII**

### **MS Project Workplan for the Cooperative Cruise Survey**

The following is a GANTT Chart version combining all proposed component workplans (with the exception of Biodiversity)