



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

UNDP/GEF/YS/RWG-F.4/3
Date: 8 November 2007
English only

**Fourth Meeting of the Regional Working Group
for the Fisheries Component**
Sokcho, Republic of Korea, 7 - 9 November 2007

Draft Meeting Report

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1 OPENING OF THE MEETING

1.1 Welcome addresses

- 1.1.1 On behalf of the UNDP/GEF Yellow Sea Project, Mr Mark Walton, Project Officer, opened the meeting and welcomed the members of the Regional Working Group-Fisheries (RWG-F) to Sokcho, Rep. of Korea.
- 1.1.2 Mr. Walton gave an update on the project progress so far (publishing of the TDA and final stages of publishing the National Data and Information and Regional Synthesis reports). He stated that this meeting would focus on the SAP preparation and that during the meeting participants will be reviewing the management actions suggested by experts during the SAP Ad Hoc Working Group and assessing the technical feasibility of those actions. The meeting will also select actions that are suitable for demonstration activities.
- 1.1.3 Mr Walton also informed the meeting that members will have to discuss the follow-up activities for completed/ongoing actions such as the Expert Exchange. Other discussions would focus on the future activities like that of the Stock Assessment, Mariculture Disease and agreement of a work plan for the forthcoming year.
- 1.1.4 Mr. Jin Xianshi, the Chair of the Regional Working Group for Fisheries, welcomed the group to Sokcho. He informed members that there was a lot to cover on the agenda and hoped the members would co-operate closely to achieve goals of the meeting and project.
- 1.1.5 Ms Yeon also welcomed the RWG-F to Sokcho on behalf of the Korean members

1.2 Introduction of members

- 1.2.1 Members and other participants were invited to introduce themselves, and 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 Documents Available to the Meeting

- 2.1.1 The chairperson invited the Secretariat (Project Management Office) to introduce this agenda item.
- 2.1.2 Mr. Walton introduced the meeting's working and information documents prepared by the PMO (Document UNDP/GEF/YS/RWG-F.4/inf.1). The list of documents is attached as [Annex II](#).

2.2 Organisation of Work

- 2.2.1 Mr. Walton presented the provisional working programme for the meeting (Document UNDP/GEF/YS/RWG-F.4/inf.3), and informed the members that Agenda 6 would occupy a lot of time.
- 2.2.2 The meeting was conducted in English.

3 ADOPTION OF THE MEETING AGENDA

- 3.1 The Chairperson introduced the Provisional Agenda (Document UNDP/GEF/YS/RWG-F.4/1) and Provisional Annotated Agenda (Document UNDP/GEF/YS/RWG-F.4/2) prepared by the PMO.
- 3.2 There were no changes to the agenda, and the Meeting adopted the agenda which is attached as [Annex III](#) to this report.

4 EXPECTED OUTPUTS FROM THE 4TH RWG-F MEETING

- 4.1 The Chairperson invited the PMO to present the expected outputs of the meeting (Document UNDP/GEF/YS/RWG-F.4/4).
- 4.2 Mr. Walton presented the list of expected outputs to be achieved by the meeting, providing some details for each agenda item's objective, reiterating the meeting's focus on considering the actions needed to finalise the SAP.
- 4.3 Mr Jang raised a question about the role of the Mariculture advisor. Mr Walton responded that RWG meeting should decide on the purpose of the advisor. Mr Jin informed members that the budget could be used for other activities, Mr Jang suggested a mariculture expert exchange programme or the funds could be used for the disease workshops
- 4.4 The members noted the expected outputs.

5 REVIEW OF COMPLETED AND ON-GOING FISHERIES COMPONENT ACTIVITIES

5.1 Stock assessment

- 5.1.1 Mr. Jin gave a presentation on the Stock Assessment Report. (UNDP/GEF/YS/SA).
- 5.1.2 Mr Lee proposed organizing the work separately such that the report should be sectioned as:
- Estimation of population size
 - Stock assessment
 - Management practice

- Ecosystem based management

5.1.3 Mr Jin thanked Mr. Lee for his proposals, but stated the scope of the stock assessment contract did not include management issues

5.1.4 There followed a discussion on the types of data that are available in the Yellow Sea region, the models that should be used, the gaps in the data and what activities we need to do in the next year.

5.1.5 Mr Jin suggested that in this section we should just focus on the report and required modifications and proposed that the ideas from the reports sections “Major issues and priorities” and Recommendations” should be discussed during Section 7: Future Activities.

5.1.6 Members agreed to accept the report without further changes

5.1.7 Members noted the information given and appreciated the clarifications given by the various participants

5.2 Expert exchange

5.2.1 Mr. Jin suggested that this should be discussed under future activities.

5.2.2 Members agreed

5.3 Sustainable Mariculture workshop

5.3.1 Mr Walton informed members of the Symposium and Workshop held in Taean on Sustainable Mariculture, hosted by Mr Jang In Kwon.

5.3.2 Members noted the information given, no further actions were agreed.

5.4 Carrying capacity Workshop

5.4.1 Mr Walton informed members of the Carrying Capacity workshop held in Rongcheng hosted by Mr Fang Jian Guang, experts presented many different models to estimate carrying capacity and there was a good exchange of ideas and methods.

5.4.2 Members noted the information given

5.5 Mariculture Disease Diagnosis, Prevention and Control

5.5.1 Mr Walton informed members of the workshop in Cheju National University hosted by Dr Choi Kwang-Sik. He reported that discussions focussed on the need for the early warning system to prevent disease outbreaks. Disease workshop participants suggested that the NACA/OIE system presently in place

was too slow and the number of notifiable diseases may not be relevant for the YS region. Participants suggested a yearly workshop on the emerging mariculture diseases in the YS.

- 5.5.2 Members noted the information given and appreciated the clarifications given by the various participants, and agreed the need for a disease workshop.

5.6 First Regional Yellow Sea Science Conference

5.6.1 Mr. Walton reported that the conference was held in Hangzhou, China 14-16 August 2007. He provided a brief summary of the conference, the topics covered by the presentations and the poster session, and the discussion at the end of the conference.

5.6.2 Some of the ideas from the discussion and presentations were considered and incorporated by the SAP Ad-hoc Working Group as management actions for the SAP 6.

6 PREPARATION OF THE SAP

6.1 SAP Consultation & SAP Ad-hoc Meetings

6.1.1 The chairperson invited Mr. Walton to explain this agenda.

6.1.2 Mr. Walton briefly explained the purpose of the SAP, and that the project is now focusing on its next major milestone to produce an SAP for the region. He gave a brief overview on history of problem identification during TDA phase, and the processes leading up to the initiation of the SAP. He also gave brief summary of the outputs from the SAP Consultation and Ad-hoc Meetings.

6.2 Regional Targets

6.2.1 Mr Walton introduced the Ecosystem Quality Objectives or Regional targets explaining that they were conceived by experts at the 1st Ad Hoc Working Group. He mentioned that there were two major regional targets for fisheries:

- 25-30% reduction in catch and fishing effort;
- Rebuilding of depleted fish stocks to normal levels

6.2.2 Ms Yeon suggested that reduction in catch for ROK may not be appropriate as once stocks had been enhanced, catches may then increase in line with the increase in maximum sustainable yield. Members agreed to delete “catch and”.

6.2.3 Mr Walton raised the idea that was currently being discussed in the World Trade Organisation that of an “End to any subsidies that confer a benefit to enterprises engaging in the harvesting of wild caught fisheries”. He mentioned that there were some exceptions for artisanal fisheries.

- 6.2.4** Mr Kim suggested that it may be difficult for ROK as it was not eligible for the special and differential treatment for developing nations that China was entitled to.
- 6.2.5** Dr Jin reported he was unaware that China had any plans to ban subsidies.
- 6.2.6** Members agreed not to include this as a regional target.
- 6.2.7** For Mariculture, experts at the 1st Ad Hoc Working Group meeting proposed
- Sustainable/Polyculture/Optimization of the distribution and density of cultured spp. Improvement culture techniques.
- 6.2.8** Mr Jang suggested changing “Improvement of culture techniques” to ‘Improvement of sustainable mariculture techniques to reduce environmental stress” and deletion of the prior phrase as this was covered by the revised regional target.
- 6.2.9** **Following these explanations, members agreed on the revised regional targets ([Annex IV](#)).**

6.3 Proposed Management Actions

- 6.3.1** Mr Walton introduced the management actions (UNDP/GEF/YS/RWG-F.4.6, Annex 1.) proposed by experts prior to the 2nd Ad Hoc Working Group Meeting and amended during the meeting.
- 6.3.2** During the review of the document there was much deliberation on the wording of actions, clarifications of the actions and some discussion to ensure consistency across the actions.
- 6.3.3** Major changes included:
- The removal of most references to illegal fishing as this was not mentioned in the causal chain analysis.
 - Under “Improvement in stock management” the legislative action “Self-regulation system by fishermen themselves and community-based management in the coastal areas. Widen the no of species for which landings data is recorded with independent checks” was moved to Technical and a new Legislative Action was formulated “Improvement of regulations related to all aspects of the marine environment. Strengthen policies to encourage the use of EBFM”
 - “Development of the diseases diagnosis and control techniques. Establishment of a network for an early warning and diagnosis system of diseases” was adopted as the ideal technical management action for Effective disease control.
- 6.3.4** The members agreed on a final version of the table attached as [Annex IV](#)

6.4 Feasibility Studies

- 6.4.1** Mr. Walton explained the feasibility assessment of the management actions. He noted that the members need only carry out feasibility assessment of “technical management actions achievable by the year 2020,” score the actions, and provide rationale for the scoring. He added that the members could also comment on the Institutional and Legislative actions.
- 6.4.2** The technical feasibility study results are attached as [Annex IV](#), rationale for the scoring is also provided

6.5 Potential Demonstration Activities

- 6.5.1** Mr. Walton introduced this agenda, explaining the selection criteria produced by the SAP Ad-Hoc Working Group to guide in choosing demonstration activities.
- 6.5.2** Mr Walton also mentioned that once the members had selected the actions for demonstration they should indicate how they are to be demonstrated, what is to be measured and what are the outcomes
- 6.5.3** Working groups were formed to review the criteria, then based on the criteria, each group proposed management actions to be demonstrated.
- 6.5.4** The groups deliberated and selected 7 management actions to demonstrate.
- 6.5.5** Members also endeavoured to prioritise the demonstration activities, but after an in-depth discussion it was agreed that the proposal substance would be given a greater weighting by the independent reviewers than any prioritisation provided by the members.
- 6.5.6** Mr Walton explained that the actions decided on by the group will need approval by PSC and suggested short listing the demonstration activities as there was no guarantee that all actions will be advertised.
- 6.5.7** However the further short listing of the actions proved difficult.
- 6.5.8** Finally members agreed that all actions should be included and are listed in [Annex V](#)
- i) Effect of closed season/area fishing
 - ii) Evaluation of effect of stock enhancement
 - iii) Effectiveness of boat buy-back measures
 - iv) Improvement in fisheries management system
 - v) Identification of optimal mesh size
 - vi) Integrated multi-trophic aquaculture.
 - vii) Land-based shrimp culture farm using limited water exchange

7 ACTIVITIES TO BE IMPLEMENTED FROM 2008 ONWARDS

7.1 Stock assessment

7.1.1 Following the recommendations from the Stock Assessment Report by Mr Jin members discussed the formation of Working Groups to harmonise stock assessment methods. TOR will be released by 7 December 2007 and proposal deadline is 28 February 2008.

7.1.2 After some discussion members agreed the need for 3 workshops, with a spring and autumn fisheries survey carried out by each country using identical gears and boats. A more detailed overview is given in [Annex VI](#).

7.1.3 The workshops are to be attended by 4-8 people in total the first Stock Assessment Workshop (SAW) is to be held in China, 25-27 March 2008. The purpose of the meeting is to:

1. Select target spp
2. Compare biological data (eg. Age determination and length measurements, stomach analysis, gonad development staging)
3. Discuss calibration of results
4. Discuss how to standardize the data collection methods
5. Discussion of data required for the second workshop.
6. Agreement of methodology for the country surveys

7.1.4 Members agreed to perform two fisheries surveys (One by China, one by ROK). These surveys are to use identical methods (bottom trawls) agreed at the 1st SAW. The First Stock Assessment Survey is to be performed over 5-7 days (excluding rough sea time) in May 2008

7.1.5 The 2nd SAW is to be held in ROK with the purpose to:

1. Discuss survey methodology;
2. Calibrate results from the survey; and
3. Review fisheries fleet data.

7.1.6 Depending on funding the Second Stock Assessment survey is to be performed in autumn, the exact dates are to be agreed in during the 2nd SAW, using same survey methods as previously agreed at the 1st SAW.

7.1.7 The Final Regional Stock Assessment Workshop is to be held in China in Spring 2009

7.2 Fisheries Carrying capacity

7.2.1 Mr Walton informed members that Ecosystem Component was going to produce estimation of primary productivity for the all areas of the Yellow Sea and this data may be useful for estimation of Fisheries Carrying Capacity.

7.2.2 Members agreed that there was not enough reliable data to produce a useful estimation of fisheries carrying capacity, and therefore it was better to leave the estimation of carrying capacity to mariculture as previously decided at the 3rd RWG-F meeting.

7.2.3 Members agreed that the budget should be used for mariculture demonstration activities.

7.3 Regional Fisheries and Ecosystem Management/Implementation Plans

7.3.1 Mr Walton referred to the budget line for this activity, however members thought that Ecosystem Based Management was still in its infancy and as there was no regional fisheries management plan, regional stock assessment was a more useful activity.

7.3.2 Members agreed that this budget should be used for the Regional Stock Assessment plans.

7.4 Expert Exchange (Changed to Young Scientist Exchange)

7.4.1 The chairperson suggested that this activity was now covered under the Regional Stock Assessment activity. Members suggested a young scientist exchange in its place.

7.4.2 The programme is aimed at young scientists with a background in stock assessment/fisheries resources that want to learn a particular skill or gain experience that is only available at institutions across the Yellow Sea.

7.4.3 Interested young fisheries scientists should submit applications to the PMO before 30 April 2008, detailing the aim of the visit, the institution, the duration, the outcomes and estimated budget.

7.4.4 Members agreed that the budget could be used to support a Young Scientist Exchange. PMO agreed to co-ordinate this activity.

7.5 Mariculture Advisor

7.5.1 Mr Walton reported that no action had been taken regarding this activity in 2007.

7.5.2 Mr Jang suggested that the budget could be used to fund a three day Regional Mariculture Conference.

7.5.3 Mr Fang and Mr Jang presented an outline of the conference ([Annex VII](#)). The major topics would include:

- Technologies to reduce environmental stress
- Emerging diseases, diagnosis and control
- Ecosystem-based mariculture management (EBM)

- 7.5.4 The conference is to be held in China 9-11 September 2008.
- 7.5.5 Members agreed that this was a useful activity, and agreed that the mariculture advisor budget should be used to fund this conference.

7.6 World Aquaculture Society

- 7.6.1 Mr Walton informed members of the forthcoming World Aquaculture Society meeting in Busan 19-23 May 2008. He asked members for their views on how YSLME project should contribute to the WAS conference. He suggested that the YSLME could host a session on project related activities, or rent a booth or just give a talk in one of the major sessions to broadcast the project's activities to wider audience.
- 7.6.2 Mr Jang informed members that he and Mr Choi (organiser of the YSLME mariculture disease) were involved in the organisation of the conference. He suggested we would have to move quickly if we wanted a session.
- 7.6.3 Mr Fang suggested that if YSLME would cover expenses then he would organise Chinese participants.
- 7.6.4 After discussion with the WAS organisers, members agreed that, PMO should chair a half-day session, inviting 7-8 scientists, rent a booth and present the mariculture activities that are supported by YSLME.

7.7 Mariculture workshop on Emerging Diseases

- 7.7.1 Mr Walton informed members that this was now covered under the Regional Mariculture Conference, and there was no longer a need to discuss this.

7.8 Other Activities

- 7.8.1 Mr Walton suggested that if there were any important fisheries meetings planned next year, YSLME may fund participation, providing members were reporting on the results from project activities
- 7.8.2 Members agreed that this was an important awareness raising activity for the project and should continue.
- 7.8.3 No further activities were suggested by members.

8 WORKPLAN FOR 2008

- 8.1 **Based on the activities discussed during the course of the meeting, members created and agreed on a workplan for 2008 for submission to the next PSC Meeting ([Annex VIII](#))**

9 OTHER BUSINESS

- 9.1 The Chairperson invited members to raise any other issues that needed to be considered by this meeting.
- 9.2 No other issues were raised.

10 DATE AND PLACE FOR 5TH RWG-FISHERIES MEETING

- 10.1 The Chairperson invited members to consider the date and place for the 5th RWG-F Meeting.
- 10.2 **Members agreed to have the Fifth RWG-F Meeting in Xi'an, China from 23-25 September 2008.**

11 ADOPTION OF THE MEETING REPORT

- 11.1 The Chairperson led the discussion of the draft meeting report. The report was reviewed, amended, and adopted by the Meeting.

12 CLOSURE OF THE MEETING

- 12.1 In closing, Mr. Jin thanked the members for their contribution to the meeting, and the PMO for arranging the meeting.
- 12.2 Following the closing statements, the Chairperson declared the meeting closed on 9th November 2007.

Annex I - List of Participants

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Annex II - List of Documents

Working Documents

UNDP/GEF/YS/RWG-F.4/1	Provisional Agenda
UNDP/GEF/YS/RWG-F.4/2	Provisional Annotated Agenda
UNDP/GEF/YS/RWG-F.4/3	Report of the Meeting (<i>to be prepared at the meeting</i>)
UNDP/GEF/YS/RWG-F.4/4	Expected Outputs from the 4 th RWG-F Meeting
UNDP/GEF/YS/RWG-F.4/5	2007 Completed and ongoing activities of the Fisheries Component
UNDP/GEF/YS/RWG-F.4/6	Preparation of the Strategic Action Programme (SAP)
UNDP/GEF/YS/RWG-F.4/7	Fisheries Component Activities for 2008 and Onwards
UNDP/GEF/YS/RWG-F.4/8	Fisheries Component's Workplan for 2008

Information Documents

UNDP/GEF/YS/RWG-F.4/inf.1	Provisional List of Documents
UNDP/GEF/YS/RWG-F.4/inf.2	Provisional List of Participants
UNDP/GEF/YS/RWG-F.4/inf.3	Provisional Working Programme for the Meeting
UNDP/GEF/YS/RWG-F.3/3	Report of "Third Meeting of the Regional Working Group for the Fisheries Component"
UNDP/GEF/YS/RSP.3/3	Report of the "Third Meeting of the Regional Scientific and Technical Panel"
UNDP/GEF/YS/PSC.3/3	Report of the "Third Meeting of the Project Steering Committee"
UNDP/GEF/YS/SA	Stock Assessment Report
UNDP/GEF/YS/SM	Sustainable Mariculture Symposium (Abstracts)
UNDP/GEF/YS/CC	Mariculture Carrying Capacity Symposium (Abstracts)
UNDP/GEF/YS/MD	Mariculture Disease Symposium (Abstracts)

Annex III – Agenda

- 1. OPENING OF THE MEETING**
 - 1.1 Welcome Addresses
 - 1.2 Introduction of Members
- 2. ORGANISATION OF THE MEETING**
 - 2.1 Documents Available to the Meeting
 - 2.2 Organisation of Work
- 3. ADOPTION OF THE MEETING AGENDA**
- 4. EXPECTED OUTPUTS FROM THE 4TH RWG-F MEETING**
- 5. REVIEW OF COMPLETED AND ON-GOING FISHERIES COMPONENT ACTIVITIES**
 - 5.1 Stock assessment
 - 5.2 Expert Exchange
 - 5.3 Sustainable Mariculture
 - 5.4 Mariculture Carrying Capacity
 - 5.5 Disease Diagnosis, Prevention and Control
 - 5.6 First Yellow Sea Regional Science Conference
- 6. PREPARATION OF THE SAP**
 - 6.1 SAP Consultation & SAP Ad-hoc Meetings
 - 6.2 Regional Targets & Proposed Management Actions
 - 6.3 Feasibility Studies
 - 6.4 Potential Demonstration Sites
 - 6.5 Remaining tasks
- 7. ACTIVITIES TO BE IMPLEMENTED FROM 2008 ONWARDS**
 - 7.1 Fisheries Carrying Capacity
 - 7.2 Regional Fisheries and Ecosystem Management / Implementation.
 - 7.3 Mariculture Advisor
 - 7.4 World Aquaculture Society
 - 7.5 Mariculture workshop on Emerging Diseases
 - 7.6 Other activities (Other important fisheries meetings)
- 8. WORKPLAN FOR 2008**
- 9. OTHER BUSINESS**
- 10. DATE AND PLACE FOR 5TH RWG-FISHERIES MEETING**

11. ADOPTION OF THE MEETING REPORT

12. CLOSURE OF THE MEETING

Annex IV: Table of Management actions

Problems and Targets			Preparation of Management Actions										
Problems identified in CCA	Regional target (2020)	General Actions	Ideal Management Actions			Analysis of Planned & On-going Management Actions			Feasible Management Actions by 2020			Technical feasibility studies	
			Technical	Institutional	Legislative	Technical	Institutional	Legislative	Technical	Institutional	Legislative	Technical	
Decline in landings of many commercial y-important species	25-30% reduction in fishing effort (2004)	Reduce no. of boat/power	Data linkage between the reduction in fishing effort and the fish biomass. Boat buy-back and control of new boat building. Reduction of fishing effort to optimum level keep biomass at biologically safe limits	Creation of alternative livelihoods until all ex-fishermen have new employment	Laws to reduce no of boats/power and licenses, combined with policies to encourage other livelihoods. Subsidies for alternative livelihoods and boat buyback	Boat buy-back has already been initiated as has control of new boat building	Creation of alternative livelihoods has already been initiated	Laws to reduce no of boats/power and licenses, combined with policies to encourage other livelihoods have already been initiated. Subsidies for alternative livelihoods and boat buyback	Boat buy-back and control of new boat building until fishing effort is reduced to optimum level to keep biomass at biologically safe levels	Creation of alternative livelihoods	Continued strengthening of the laws to reduce no of boats/power and licenses, combined with policies to encourage other livelihoods. Subsidies for alternative livelihoods and boat buyback	3	Reduction in fishing effort already implemented for several years. Some fishermen's resistance to boat buy back.
		Stop fishing in certain areas/ seasons	Identification of closed areas/seasons according to scientific knowledge of fish spp.	Increase in general public awareness of closed seasons and fishermen's awareness of regulations and future benefits. Capacity building for enforcement.	Improvement of regulations. Stop illegal fishing.	Some closed areas during spawning season for selected spp. In China - summer fishing ban. Insufficient knowledge	Mechanism for Increasing awareness of regulations.	Conservation acts to protect fish stocks.	More science based closure of areas and seasons. Summer fishing ban to be continued in China. Limitation of trawling to certain areas.	Increased public awareness of regulations	Conservation acts to protect fish stocks	4	Already legislated and implemented
		Increase in mesh size	Identification of optimal size at capture and reduction of by-catch	Increase in public awareness of regulations and future benefits. Capacity building for enforcement.	Improvement of regulations of size limits, monitoring and enforcement. Increase in funding for the enforcement.	Optimal size at capture is only known for some commercial species	Public awareness of regulations and future benefits is increasing	Some regulation in place but need to improve enforcement.	Improved selectivity of fishing gears.	Increase in Public awareness of regulations and future benefits	Improvement of regulations.	3	It is already improving, regulations to control mesh size
		Improvement in Stock management	Use of precautionary approach and ITQ & EBFM based on improved monitoring. Establishment of database and joint stock analysis/ assessment. Self-regulation system by fishermen themselves and community-based management in the coastal areas. Widen the no of species for which landings data is recorded with independent checks	Coordination between scientists, managers, fishermen, gov depts and regionally. Establish regional organisation.	Improvement of regulations related to all aspects of the marine environment. Strengthen policies to encourage the use of EBFM	ROK - TAC for limited number of spp. China-Reduction in landings and summer fishing ban. Widespread in ROK for self-regulation system by fishermen. Landings data only recorded for limited no of spp. Fisheries independent surveys	Insufficient coordination between scientists, managers, fishermen, gov depts and regionally. No regional organisation	Limited number of policies related to the use of EBFM	Introduction of EBFM based on improved monitoring and assessment. Self-regulation system by fishermen themselves and community-based management in the coastal areas	Improved coordination between scientists, managers, fishermen, gov depts and regionally. Establish regional organisation	Introduction of comprehensive policies to encourage the use of EBFM	2	EBFM is not practiced anywhere in the world

	Rebuilding of depleted fish stocks	Rebuilding Stocks	Stock enhancement and habitat improvement that take into account the environmental impacts	Coordination between scientists, managers, fishermen, gov depts and regionally	Improvement of policy for stock enhancement and habitat improvement.	Habitat improvement; many artificial reefs deployed and artificial seaweed beds.. Massive release of juveniles of many species .	Limited coordination between scientists, managers, fishermen, gov depts and regionally	Limited studies on the environmental impact into the policy of stock enhancement and habitat improvement. Improvement of policy of stock enhancement and habitat improvement .	Controlled stock enhancement based on sound scientific knowledge, with increased awareness of the ecosystem impacts. Habitat improvement to be continued	Better coordination between scientists, managers, fishermen, gov depts and regionally	Improvement of policy for stock enhancement and habitat improvement that take into account the ecosystem impacts.	3	knowledge improving but future budgets uncertain
Unsustainable mariculture practices	Improvement of sustainable mariculture techniques to reduce environmental stress	Develop Environmental-friendly mariculture models and technology	Increase implementation of Integrated Multi-trophic Aquaculture (IMTA)	Mechanism to increase the public awareness of the benefits of IMTA	Use the licenses for the control of farm area and species cultured based on carrying capacity.	Integrated Multi-trophic Aquaculture (IMTA) is implemented in some areas	Limited mechanisms to increase the public awareness of the benefits of IMTA	No specific licenses to regulate IMTA practise	Integrated Multi-trophic Aquaculture (IMTA) is implemented as the major technology. Increase the economic benefit from IMTA combined with Carrying capacity	Training and capacity building. Mechanism to increase the public awareness of the benefits of IMTA	Use the licenses for the control of farm area and species cultured based on carrying capacity.	3	Very likely in China already practiced in some areas. In ROK there are no suitable areas in the YS,
			Encourage the mariculture from inshore to offshore and innovating the new technologies	Mechanism to increase in Public awareness of the benefits of offshore aquaculture. Coordination between different ministries, local government and private sectors	The appliance of standards and regulations for offshore mariculture	There are some suitable innovative offshore aquaculture technologies adapted to different conditions	Limited number of demonstration sites on a commercial scale	Some regulations for encouraging sustainable offshore mariculture.	Development of standard offshore technologies to different conditions. GAP (Good Aquaculture Practice) demonstration in commercial scale	Mechanism to increase in Public awareness of the benefits of offshore aquaculture. Coordination between different ministries, local government and private sectors	Establishment of standards and regulations for offshore mariculture	3	Technology already developed, some offshore cages already established. But not many suitable places in YS (water depth)
		Reduce nutrient discharge	Establishment of land-based mariculture systems using limited water exchange including recirculating systems. Improvement of artificial diet	Mechanism for increasing public awareness of the benefits of limited-water exchange systems and artificial feeds.	Regulation to control nutrients discharge and to discourage use of trash fish	There is substantial development in improvement of artificial diet and limited water exchange aquaculture systems, recirculating systems. However these systems are only used by very limited numbers farmers.	Limited number of demonstration sites for commercial scale limited-water exchange systems. Subsidies available for artificial diets in Korea.	Preparing regulations to control nutrients discharge and policies to discourage use of trash fish	Establishment of Limited water exchange aquaculture systems and improvement of artificial diet is practised in commercial scale. GAP (Good Aquaculture Practice) demonstration in commercial scale	Establishment of a mechanism for increasing public awareness of the benefits of limited-water exchange systems and artificial feeds.	Improved regulations to control nutrients discharge and Policies to discourage use of trash fish	3	Land based system easily regulated. But may be some resistance from farmers
		Effective diseases Control	Development of the diseases diagnosis and control techniques. Establishment of a network for an early warning and diagnosis system of diseases	Improved coordination between governments, scientists and farmers.	Legislation for preventing infectious disease transmission	Diagnosis and control techniques for some diseases developed. National networks for diseases monitoring system established	Insufficient coordination between government, scientists and farmers.	Inadequate legislation for preventing infectious disease transmission	Diagnosis and control techniques for major diseases are established. The network for an early warning and diagnosis system of diseases is well operated	Coordination between governments, scientists and farmers is intensified.	Application of strict legislation for controlling diseases.	4	Farmers will become much more accepting of new techniques and management measures

Annex V: Demonstration activities

1. Effect of closed season/area fishing

- Some fishing village along Yellow Sea
- Monthly sampling and investigation of fishing village
- Collection of catch, fishing effort, cost, and income

Expected outputs:

- To analyze changes of the catch composition, size, weight before and after closure period
- To evaluate the fisherman's benefit from season/area fishing closures

2. Evaluation of effect of stock enhancement

- Coastal area
- Measure migration and distribution, growth, recapture rate using mark-recapture techniques

Expected output:

- To evaluate the migration,
- To assess growth rate
- To assess recapture rate

3. Effectiveness of boat buy-back measures

- Coastal area
- Collection of catch and fishing effort for major commercial fisheries

Expected outputs:

- To know about the reduction no. of fishing boats in the past
- To assess the no. of fishing boats to be reduced.
- Assess the variations in CPUE of major commercial fisheries

4. Improvement in Fisheries Management System

- Coastal area
- Collection of Fisheries Data and Catch Composition of Main Target Species
- Collection of information of management measures

Expected Output:

- Estimation of population size, optimum fishing effort and allowable catch
- To assess the effectiveness management systems of fisheries stocks

5. Identification of Optimal Mesh Size

- Coastal area
- To measure size composition and catch rate by different mesh sizes,
- Collection of information on size at First Maturity

Expected Output:

- Size Selectivity of Fishing Gears
- Evaluation of the effect of mesh size on the change in Size or Age Composition of Major Target Species

6. Integrated Multi-trophic Aquaculture

- Sungo Bay and ambient areas, China
- Ecological Benefit Enhancement demonstration- Chudao, Rongcheng, China
- Integrated Multi Trophic Aquaculture (IMTA) - Xunshan, Rongcheng, China

Expected outputs:

- To establish a economical and ecological benefit mariculture models
- To demonstrate the GAP to governments and farmers
- To increase the economic benefit by implementing the IMTA and offshore mariculture
- To assess the contribution of IMTA and offshore mariculture on environment comparing with monoculture and inshore mariculture
- To improve the ecosystem quality in inshore areas

7. Land-based shrimp culture farm using limited water exchange

- Mid-west coast of Korea
- 2 sites(HDPE-lined outdoor pond and greenhouse-enclosed raceway)
- Culture of shrimp in high density
- Easy to access for farmers all the year

Expected Outputs:

- To minimize impact on the external environment by treating wastewater
- To maintain shrimp culture sustainable by applying heterotrophic technology
- To keep facilities highly bio-secure and minimize the risk of viral infection from environment
- To increase production up to 15 times (in outdoor) to 50 times (in indoor) than traditional method

Annex VI: Regional Stock Assessment Plan

TOR released 7 December 2007

Proposals due in 28 February 2008

1st Workshop – China, 25 – 27 March 2008.

Groups of 2-4 people from each country

Purpose of the meeting:

1. Select target spp
2. Comparison of biological data (eg. Age determination and length measurements, stomach analysis, gonad development staging)
3. Discuss calibration of results
4. Discuss how to standardize the data collection methods
5. Discussion of data required for the second workshop.
6. Discussion of methodology for the country surveys

First Country surveys (before 15 June)

1. Bottom trawl surveys in 5-7 days (Excluding Rough Sea Time) in May 2008
2. The exact details of harmonization of gear and ships in order to standardize data collection methods will be agreed at the 1st Stock assessment workshop
3. A suggestion was made that commercial pair-trawlers can be used

Second workshop – Korea 10-12 June 2008

1. Discuss of survey methodology
2. Calibration of results from survey data
3. Review of fisheries fleet data,

Second Country Survey

Autumn survey – 5-7days using the same methodology and techniques as the spring survey

Final Workshop for Regional Stock Assessment of selected species in Spring 2009 (China)

Annex VII: Regional Mariculture Conference

Regional Science Conference on the sustainable Mariculture and control Diseases

Title: RSC on the sustainable mariculture in the Yellow Sea

Date: Sep. 9-11, 2008

Place: Qingdao or Weihai, China

Major topics:

- Innovated mariculture technologies to reduce environmental stress
- Immerging disease, diagnosis and its control
- Ecosystem-based mariculture management (EBM)

Schedule:

- Day 1: presentation by invited speakers from both countries
- Day 2: Discussion among three WGs including mariculture technology, diseases control and EBM
- Day 3: Wrap-up meeting with the results of discussion by three WGs

Number of invited speakers:

- about 15 speakers and panellists from each country (20 – 30 in total)

Description of organisation:

- YSLME/PMO will discuss topics and details with Dr. Fang, Jianguang (YSFRI, China) and Jang, In Kwon (NFRDI, Korea). The researchers and technicians of YSFRI (Yellow Sea Fisheries Research Institute) will help for the best accomplishment of the conference

Annex VIII: Workplan for 2008

ID	Task Name	Duration	Start	Finish	1st Half		2nd Half																	
					Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
1	OBJECTIVE I: FISHERIES COMPONENT	1194 days?	Mon 4/11/05	Fri 10/30/09																				
2	IA: STOCK ASSESSMENT	1167 days?	Mon 4/11/05	Wed 9/23/09																				
3	ACT 1: Review of existing data	417 days	Mon 4/11/05	Thu 11/9/06																				
4	Regional Working Group (WG) Meeting 1	4 days	Mon 4/11/05	Thu 4/14/05																				
5	<u>Contract to relevant national institutions (contract)</u>	101 days	Tue 10/4/05	Mon 2/20/06																				
6	<u>Revise national data and info (contract)-NFRDI-YSFRI</u>	290 days	Tue 10/4/05	Thu 11/9/06																				
7	ACT 2: Diagnosis of Stock Conditions	8 days	Fri 11/10/06	Tue 11/21/06																				
8	Finalisation of data and info at WG Meeting 3	4 days	Fri 11/10/06	Wed 11/15/06																				
9	Inputs to final TDA	4 days	Thu 11/16/06	Tue 11/21/06																				
10	ACT 3: Develop Common methodology of regional stock as	430 days?	Tue 1/3/06	Thu 8/23/07																				
11	<u>Gathering existing methods, prepare suggested methods (c</u>	152 days	Tue 1/3/06	Tue 8/1/06																				
12	Discuss the methods (WG Meeting 3)	4 days?	Tue 8/1/06	Fri 8/4/06																				
13	<u>Revise regional methods (consultant)</u>	95 days	Mon 8/7/06	Fri 12/15/06																				
14	Discuss and modify the methods (WG Meeting 4)	4 days	Mon 8/20/07	Thu 8/23/07																				
15	Finalise the method (WG Meeting 4)	4 days	Mon 8/20/07	Thu 8/23/07																				
16	ACT 4: Perform Demonstration of Joint-Regional Survey	564 days	Wed 10/19/05	Wed 12/12/07																				
17	Winter Survey	564 days	Wed 10/19/05	Wed 12/12/07																				
18	Prepare guidelines for survey (consultant)	80 days	Thu 8/23/07	Wed 12/12/07																				
19	Accept guidelines (Technical Meeting 1 - Qingdao)	2 days	Wed 10/17/07	Thu 10/18/07																				
20	Obtain and Assemble Equipment	54 days	Wed 10/19/05	Fri 12/30/05																				
21	Ship Rental for first Joint Survey	16 days	Wed 1/4/06	Wed 1/25/06																				
22	Analyse survey result (participants of survey)	67 days	Fri 1/27/06	Sun 4/30/06																				
23	Publish survey result (printing)(PMO)	65 days	Mon 5/1/06	Fri 7/28/06																				
24	Spring Survey	178 days	Thu 1/26/06	Fri 9/29/06																				
25	Prepare guidelines for survey (consultant)	1 day	Thu 1/26/06	Thu 1/26/06																				
26	Accept guidelines (Technical Meeting 2 - ?)	2 days	Mon 3/27/06	Tue 3/28/06																				
27	Obtain and Assemble Equipment	25 days	Wed 3/29/06	Mon 5/1/06																				
28	Ship Rental for Second Joint Survey	30 days	Mon 5/1/06	Sat 6/10/06																				
29	Analyse survey result (participants)	80 days	Mon 6/12/06	Fri 9/29/06																				
30	Publish survey result (printing)	22 days	Mon 10/2/06	Tue 10/31/06																				
31	ACT 5: Perform Initial Joint Regional Stock Assessment	773 days	Tue 10/10/06	Wed 9/23/09																				
32	Prepare a plan for stock assessment (Consultant)	114 days	Tue 10/10/06	Thu 3/15/07																				
33	Technical discussion on the plan (WG Meeting 4)	60 days	Wed 8/1/07	Tue 10/23/07																				
34	<u>Implement regional stock assessment</u>	155 days	Tue 8/7/07	Mon 3/10/08																				
35	Discuss results of assessment (WG Meeting 5)	4 days	Fri 8/1/08	Wed 8/6/08																				
36	<u>Additional assessment if necessary (contracts)</u>	261 days	Thu 8/7/08	Thu 8/6/09																				
37	Accept the assessment result (WG Meeting 6)??	4 days	Fri 8/7/09	Wed 8/12/09																				
38	Publication of assessment results (printing)	30 days	Thu 8/13/09	Wed 9/23/09																				
39	ACT 6: Create mechanism for regional multispecies stock a	451 days	Thu 11/17/05	Mon 8/6/07																				
40	Identify major barriers in stock assessment (WG Meeting 2)	4 days	Thu 11/17/05	Mon 11/21/05																				
41	Identify the species to be assessed (WG Meeting 2)	4 days	Thu 11/17/05	Mon 11/21/05																				
42	Prepare draft mechanism for annual assessment (Consultar	131 days	Mon 1/2/06	Fri 6/30/06																				
43	Discuss the draft mechanism (WG Meeting 3)	64 days	Tue 8/1/06	Fri 10/27/06																				
44	<u>Revise the draft mechanism (consultant)</u>	159 days	Tue 8/8/06	Thu 3/15/07																				
45	Finalisation of the mechanism (WG Meeting 4)	4 days	Wed 8/1/07	Mon 8/6/07																				
46	IB: CARRYING CAPACITY	827 days	Thu 9/1/05	Mon 10/27/08																				
47	ACT 1: Review of existing state of knowledge	245 days	Thu 9/1/05	Fri 8/4/06																				
48	<u>Contract to relevant national institutions for assessing infor</u>	101 days	Mon 10/3/05	Fri 2/17/06																				
49	Present at WG Meeting 2	4 days	Thu 11/17/05	Mon 11/21/05																				
50	Revise national state of knowledge	184 days	Sat 11/19/05	Tue 8/1/06																				
51	Finalisation of report (WG Meeting 3)	4 days	Tue 8/1/06	Fri 8/4/06																				
52	Inputs to final TDA	30 days	Thu 9/1/05	Tue 10/11/05																				
53	ACT 2: Fill in knowledge gaps for carrying capacity analysi:	131 days	Mon 1/2/06	Fri 6/30/06																				
54	<u>Prepare guidelines for carrying capacity (consultant)</u>	131 days	Mon 1/2/06	Fri 6/30/06																				
55	Act 3: Perform iterative series of analysis of carrying capac	283 days	Mon 8/7/06	Tue 9/4/07																				
56	<u>Prepare workplan for the analysis (consultant)</u>	25 days	Mon 8/7/06	Fri 9/8/06																				
57	Discuss and agree on the workplan (WG Meeting 4)	4 days	Wed 8/1/07	Mon 8/6/07																				

List of Acronyms

GEF	Global Environment Fund
PMO	Project Management Office
ROK	Republic of Korea
RWG-B	Regional Working Group – Biodiversity
RWG-P	Regional Working Group – Pollution
SAP	Strategic Action Programme
TDA	Transboundary Diagnostic Analysis
UNDP	United Nations Development Programme
WWF	World Wildlife Fund
YS	Yellow Sea
YSEPP	Yellow Sea Ecoregion Planning Programme