



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

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**Third Meeting of the Regional Scientific and Technical Panel
for the UNDP/GEF Yellow Sea Project**
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**Report
On Implementation of
Regional Working Group for Fisheries**

by

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1. Introduction

According to the workplan of working group for fisheries components in 2006, the following activities have taken.

1) Yellow Sea Fisheries Research Institute, China and National Fisheries Research and Development Institute, Korea have completed and sent same formatted database and reports to PMO, and presented the reports during the 3rd Meeting of the Regional Working Group for the Fisheries Component in Rongcheng, China, 25 -28 October 2006.

2) A consultant from Pukyong National University, Korea, was contracted to prepare the regional synthesis, and the draft final report is completed. During the 3rd RWG-F Meeting, the consultant presented his results-to-date, highlight the regional status and trends of importance, and show the fisheries data gaps.

3) A consultant from the Yellow Sea Fisheries Research Institute, China was contracted to Prepare Report of Fisheries Regional Stock Assessment Methods and Suggestions for a Comprehensive Strategy, and the last version of the report is completed. During the 3rd RWG-F Meeting, the consultant presented his results-to-date, highlight the relevant findings and explain the proposed methodology towards a Joint-Regional Fisheries Stock Assessment in the Yellow Sea Large Marine Ecosystem, highlighting the suggested frequency of assessments, potential constraints and the species to be addressed.

4) PMO mariculture advisor, Mr. G. Ivan Soto, presented document related to Carrying Capacity issues. Mr. Soto noted that the consultancy to conduct a carrying capacity study was advertised early in 2006 for bidding but the bids were withdrawn. Therefore, the PMO considered necessary to present at this meeting an overview of the current methodologies being used worldwide to determine carrying capacity. The report included a summary of approaches towards carrying capacity of coastal waters for specific aquaculture practices.

5) A consultant from Pusan National University, Korea, was contracted to prepare a detailed proposal for a Joint Applied Research Programme for Sustainable Mariculture as well as a Set of Technical Guidelines with a Detailed Workplan for Training Courses on Sustainable Mariculture and Diseases, Diagnosis and Control Techniques. The preliminary version of the report is completed. During the 3rd RWG-F Meeting, the consultant presented his results-to-date, highlight the regional status and trends of importance, and suggested a Joint Programme on Sustainable Mariculture.

6) A Consulting Firm, Marine Resources Assessment Group Ltd. (MRAG) from the UK was contracted, based on the open bidding process, to assess information on existing national laws, regulations, regional and international conventions applied to the YSLME, highlighting the legislative issues and including a study of the feasibility of a regional agreement on sustainable use of fisheries resources and, with this information, prepare a draft document of "Plan for a Regional Agreement on Sustainable Use of YSLME Fisheries Resources" for the consideration of the YSLME member countries. The preliminary version of the report is completed and presented during the 3rd RWG-F Meeting.

7) UNDP/GEF Yellow Sea Project was represented at the APFIC meeting through the participation of RWG-F members, Dr. In Kwon JANG and Dr. Xianshi JIN, three presentations were given during the meeting.

2. Activities

2.1 National data and information collection

Based on the tasks listed in the Statement of Work issued by the PMO, Yellow Sea Fisheries Research Institute, China and National Fisheries Research and Development Institute, Korea have completed and sent same formatted database and reports to PMO, and presented the reports during the 3rd Meeting of the Regional Working Group for the Fisheries Component in Rongcheng, China, 25 -28 October 2006.

On behalf of the Yellow Sea Fisheries Research Institute, China, Mr. Jin Xianshi presented the report on National Data and Information Collection Activity. Mr. Jin presented the activity's progress-to-date for China fisheries national review, explaining the types of data and information that have been collected, the sources of data, the data and information gaps, assessment methods, socio-economic data, such as national laws and international agreements. He noted, among others, that: i) the stock of largehead hairtail has declined in the Yellow Sea; ii) anchovy stock has become an important fishery since 1990s; (iii) stock of the small yellow croaker has recovered during recent years in the Chinese side of the Yellow Sea and, iii) the usefulness of several models to estimate Maximum Sustainable Yield (MSY) and highlighted the availability of useful tools such as ECOPATH.

Mr. Jin described major fisheries management measures in China: i) control of fishing effort; ii) output control; and, iii) ban fishing in summer; and iv) management of mariculture.

On behalf of the National Fisheries Research and Development Institute, Korea, three persons presented the national data and information collection report from Korea. Mr. Sohn Myoung Ho presented the first part of the Korean national report related to fisheries data collection and highlighted the high biodiversity of the Yellow Sea region, major trends found and the results of trawl survey. He noted that the total landings of major commercial important species have steadily decreased since 1987. He highlighted that largehead hairtail landings decreased dramatically for the same period of time. He also described that the size of fishing vessels became smaller but with stronger power since new equipment has been included in many fishing boats due to improvements in technology. He mentioned that dominant species has been changed from large demersal species to small pelagic species in the last decade. He also described the gaps in data and information such as the fishermen's reluctance to share his data and highlighted the importance to conduct a cooperative survey to gather the data required to improve any further analysis.

Mr. Jang In Kwon presented the second part of the Korean national report related to mariculture data collection and highlighted that the mariculture production in the Yellow Sea (Korea) considered fish (18 species), shellfish (15 species), seaweeds (10 species), crustaceans (2 species) and others (3 species). He noted, among others, that while the production of finfish, shellfish and crustaceans increased the total production of seaweeds decreased by around 18% in the last 10 years. He proposed a few suggestions for a further Joint Applied Research Programme for Sustainable Mariculture in the Yellow Sea Region and noted that this research programme may focus on: i) non-enclosed systems (polyculture) in China; and, ii) enclosed systems (shrimp culture with zero water exchange) in Korea. It was noted that with this joint research, it would be possible to minimize the environmental impacts from mariculture.

Mr. Kim Dohoon presented the third part of the Korean national report related to socio-economic data collection and highlighted that the number of fishing vessels in Korean Yellow Sea has remained stable since year 2000 and that the number of fishermen has shown a decrease in all provinces except Gyeonggi province.

2.2 Regional data and information synthesis

The results from the activity to collect national fisheries data and information from China and Republic of Korea were compiled to create a regional synthesis, a consultant from Pukyong National University, Korea, Dr. LEE Jang-Uk, was contracted to prepare the regional synthesis, and the draft final report is completed. During the 3rd RWG-F Meeting, the consultant presented his results-to-date, highlight the regional status and trends of importance, and show the fisheries data gaps. This work was carried out from June to September 2006. The results of the regional synthesis will contribute to the Fisheries Chapter of the Transboundary Diagnostic Analysis (TDA).

During the 3rd RWG-F Meeting, Dr. LEE Jang-Uk, presented his findings highlighting major issues in fisheries status and trends, biological and economical data, mariculture and the socio-economic condition in the Yellow Sea areas of the participating countries. He highlighted major issues on Fisheries: i) Heavy exploitation of capture fisheries in the Yellow Sea; ii) Stable fishing effort and increasingly level of fisheries; and, iii) Increase of catch per unit of effort (CPUE) and the importance to conduct a fisheries stock assessment. He also noted that for the biological and economic data the issues considered were: i) Differences in growth parameters per analysed species and the importance to improve age estimation techniques; ii) Differences in reproduction and spawning characteristics for some species and the importance to develop an "index of recruitment for commercially important species"; iii) Scarcity of enough information on migration and distribution of commercial species; and, iv) Limited information on bottom trawls surveys and the importance of joint-cruises.

Dr. Lee also emphasized major issues for mariculture: i) Steadily increase of aquaculture production; ii) Increasing demand for aquaculture areas; and, iii) A predominantly mariculture of shellfish and seaweed in the Yellow Sea. He also noted that in regards to the analysis of socio-economic issues the major findings were: i) Only general descriptions have been provided by the national reports without the detailed analyses required for long-term data interpretation; and, ii) The need to collect long-term data on fisheries economics as well as to include expertise on economic data analysis in future studies. He finally recommended the establishment of a regional fisheries database.

Following the discussion of the national and regional synthesis reports, The meeting realized that these results were very important outcomes of the project, and agreed to publish the final versions of national reports and the regional synthesis after the revisions according to the comments provided.

2.3 Stock Assessment

A comprehensive report on existing stock assessment methods and suggestions for a comprehensive strategy for joint-regional stock assessment was carried out from June to September 2006. A consultant from the Yellow Sea Fisheries Research Institute, China, Dr. Jin Xianshi was contracted to develop this activity, and the last version of the report is completed. The results of the regional synthesis will contribute to the Fisheries Chapter of the Transboundary Diagnostic Analysis (TDA). During the 3rd RWG-F Meeting, the consultant presented his results-to-date, highlight the relevant findings and explain the proposed methodology towards a Joint-Regional Fisheries Stock Assessment in the Yellow Sea Large Marine Ecosystem, highlighting the suggested frequency of assessments, potential constraints and the species to be addressed. The report includes: i) A comprehensive report on the current techniques used to model carrying capacity both locally and internationally and a comparison with other methodologies; ii) A list of the sources of data and information collected throughout the report; iii) A list of major issues and priorities that need to be addressed in the Yellow Sea region; and, iv) A suggested methodology to

develop a series of joint-regional stock assessment in the Yellow Sea Large Marine Ecosystem.

During the 3rd RWG-F Meeting, Dr. Jin presented his report entitled: "Comprehensive Regional Report on Stock Assessment Methods and Suggestions for a Comprehensive Strategy for a Joint-Regional Stock Assessment". The major methods to estimate fisheries stock that commonly used globally or regionally with explanation on the applications and requirements of these methods were provided. He also listed major problems to identify the appropriate method to be used in this project.

Dr. Jin also suggested a list of activities within three major steps: (i) "Establishment of Scientific Working Groups (WGs)"; (ii) Establishment of an Exchanging Mechanism of Survey and Fisheries Data"; and (iii) Establishment of a Joint-Survey Mechanism". He recommended a methodology for the "Joint-regional Fisheries Stock Assessment Programme" considering the following: i) Implementation of a collection system of accurate catch and effort and biological data; ii) Selection of a suitable model from the existing classical mathematical models for reiterative use in fisheries stock assessment in the YS region; iii) Expert consultation towards the development of new models based on the classical/new models used in other regions; iv) Implementation of a collaborative research programme towards a joint-prediction system of stock size of commercially important species in the region; and, v) Implementation of a joint-scientific survey programme considering variables such as scope, frequency, sampling strategies and survey design.

Following the discussion of the consultant report, **The meeting realized** that these results were very important outcomes of the project, and agreed to publish the **final versions of** report after the revisions according to the comments provided.

2.4 Guidelines for Carrying Capacity Analysis

PMO mariculture advisor, Mr. G. Ivan Soto, presented document related to Carrying Capacity issues. Mr. Soto noted that the consultancy to conduct a carrying capacity study was advertised early in 2006 for bidding but the bids were withdrawn. Therefore, the PMO considered necessary to present at this meeting an overview of the current methodologies being used worldwide to determine carrying capacity. The report included a summary of approaches towards carrying capacity of coastal waters for specific aquaculture practices. The following steps for the implementation of Carrying Capacity and Assimilative Capacity were suggested: i) Scoping Study; ii) Review of Regulation and Monitoring of Aquaculture; and, iii) Implementation of a Demonstration site.

He also proposed that the Scoping Study should consider a review of the current major approaches to determine Carrying Capacity; the identification of carrying capacity approaches suitable to be implemented in the YSLME region; and, outlines for a prioritize field research in the YSLME region. Finally, the "Implementation of a Demonstration Site" considered major issues suggested to be addressed towards the identification and implementation of a demo site(s) in the YSLME region in order to undertake a Carrying Capacity approach. The set up for this activity will demand all the theoretical considerations from previous steps.

Following extensively discussions on carrying capacity issues, the meeting agreed on the following:

- The RWG-F will tackle carrying capacity issues from the fisheries and mariculture perspectives separately.
- It will be more appropriate that the initial effort should focus on carrying capacity for mariculture first since these experiences could be used for fisheries in the

- future.
- There is a need of an “expert consultation” that could provide a proposal to approach other major carrying capacity issues in future.

2.5 Sustainable mariculture

The results from the review of the existing issues affecting the sustainability of mariculture in the YSLME region were compiled to suggest a Joint Programme on Sustainable Mariculture. A consultant from Pusan National University, Korea, Dr. Chung Ik-Kyo was contracted to prepare a detailed proposal for a Joint Applied Research Programme for Sustainable Mariculture as well as a Set of Technical Guidelines with a Detailed Workplan for Training Courses on Sustainable Mariculture and Diseases, Diagnosis and Control Techniques. The preliminary version of the report is completed. This work was carried out from February to September 2006. The results from this activity aim to contribute to the Fisheries Chapter of the Transboundary Diagnostic Analysis (TDA). During the 3rd RWG-F Meeting, the consultant presented his results-to-date, highlight the regional status and trends of importance, and suggest a Joint Programme on Sustainable Mariculture.

During the 3rd RWG-F Meeting, Dr. Chung presented his findings and highlighted the regional mariculture status and trends of importance, and suggested a Joint Programme on Sustainable Mariculture. He noted that the target is the development and implementation of a “Joint-regional applied research programme for sustainable mariculture” and described the activity within three major components: i) Application of the Ecosystem Based Aquaculture Management; and, ii) Application of the Integrated Coastal Zone Management with specific aquaculture practice. Dr. Chung described the logical framework for the development of a Joint-Regional Applied Programme for Sustainable Mariculture. He also noted that his approach considered: i) major issues affecting sustainability of Yellow Sea mariculture; and, ii) suggested actions to be taken.

Following the discussion of the consultant report, The meeting realized that these results were very important outcomes of the project, and agreed to publish the final versions of report after the revisions according to the comments provided.

2.6 Law, regulations and Fisheries Management Plans

A Consulting Firm, Marine Resources Assessment Group Ltd. (MRAG) from the UK was contracted, based on the open bidding process, to assess information on existing national laws, regulations, regional and international conventions applied to the YSLME, highlighting the legislative issues and including a study of the feasibility of a regional agreement on sustainable use of fisheries resources and, with this information, prepare a draft document of “Plan for a Regional Agreement on Sustainable Use of YSLME Fisheries Resources” for the consideration of the YSLME member countries. This plan will include measures for overcoming the legislative issues, measures for strengthening laws and regulations, suggestions of ways to improve and strengthen enforcement and the feasibility and mechanism of implementing the “FAO Code of Conduct for Responsible Fisheries” in a regional management plan for fisheries resources in the Yellow Sea. The preliminary version of the report is completed. This work was carried out from May to September 2006. The results from this activity aim to contribute to the Fisheries Chapter of the Transboundary Diagnostic Analysis (TDA) and to the Strategic Action Programme (SAP).

During the 3rd RWG-F Meeting, Dr. Kim Dohoon, on behalf of MRAG, explained that the plan included measures for addressing the legislative issues, measures for strengthening laws and regulations, suggestions of ways to improve and strengthen enforcement and the feasibility and mechanism of implementing the “FAO Code of Conduct for Responsible Fisheries” in a regional management plan for fisheries resources in the Yellow Sea.

Dr. Kim mentioned that the report summarized the existing national laws, regulations, regional and international conventions as it applies to the Yellow Sea. He highlighted that the draft plan for a regional agreement emphasized that international instruments encourage states to establish Regional Fisheries Organizations (RFOs) where appropriate, and to strengthen existing RFOs in order to improve their effectiveness in establishing and implementing conservation and management measures. Dr. Kim went on to describe the outlines of the GENERAL MANAGEMENT PLAN addressing, among others, the FAO principles cited in the Code of Conduct. The outlines of the draft agreement included the scope, objectives and proposed activities.

The meeting noted that some major tasks contracted to MRAG were not fully covered by the report, e.g. the feasibility analysis to develop a regional agreement. It was also noted that the delay in the submission report to PMO seriously affected the review of the document.

The meeting agreed that:

- (i) PMO should provide the MRAG with the comments of the meeting clearly indicating to the consulting firm that the report should follow the TORs listed in the contract, and should address the identified regional problems listed in the approved Project Document; and
- (ii) MRAG should re-write the report addressing the suggestions made during this meeting.

2.7 Other Activities

Asia-Pacific Fishery Commission (APFIC) is a FAO Regional Fishery Body that acts as consultative forum working in partnership with other regional organisations and arrangements and members. During the meeting, 14 Asian countries agreed to cut trawling and push net fishing as a first step for reversing the production of low value trash fish and 'fishing down the food chain'. Concluding the APFIC meeting, the members also agreed to reduce capacity for harvesting trash fish by trimming down on trawling boats and push nets. "The bold agreement reached by the APFIC members is the outcome of two years of intense consultations between countries, our partners from international and regional organizations, and civil society", as it was noted by FAO representatives. In addition, it was agreed to promote the transformation of low value trash fish – species with little or no commercial value – into food for human consumption through better processing and post harvest handling, and to reduce fish meal content in aquaculture feed. A first set of recommendations to reshape fisheries policies was also adopted. Likewise, there was an agreement to the principle of 'co-management' or including stakeholders in the planning and implementation of fisheries management, through more equal sharing of authority and responsibility for the management of fisheries, and involving a partnership between government and local communities. The APFIC meeting also agreed to intensify cooperation for two emerging issues – managing fishing capacity and improving the region's access to trade markets through improved fish quality and safety standards.

UNDP/GEF Yellow Sea Project was represented at the APFIC meeting through the participation of RWG-F members, Dr. In Kwon JANG and Dr. Xianshi JIN, their reports "Status of Mariculture Activities in the Yellow Sea Coast of the Republic of Korea", and "Review of the Yellow Sea Fisheries Resources and Management Needs" were presented in session "Integrating fisheries into Large Marine Ecosystem/regional Seas arrangements". Dr. Jin was also invited to attend the FAO Panel "management tools & Interventions (focus on trash fish)", and presented a report of "Brief Introduction of Marine Fisheries Management in China".

3. Difficulties in implementation

- (1) the consultancy to conduct a carrying capacity study was advertised early in 2006 for bidding, but the bids were withdrawn. It will be more appropriate that the initial effort should focus on carrying capacity for mariculture first since these experiences could be used for fisheries in the future. There is a need of an “expert consultation” that could provide a proposal to approach other major carrying capacity issues in future.
- (2) some major tasks contracted to MRAG were not fully covered by the report, e.g. the feasibility analysis to develop a regional agreement. It was also noted that the delay in the submission report to PMO seriously affected the review of the document.
- (3) Joint cruises surveys for stock assessment have not yet conducted, and wait for approving.

4. Remarks

The activities planned of RWG-Fisheries have mostly gone smoothly, and efficiently. It is request to organize a workshop on stock assessment and carrying capacity.