



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

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SCIENTIFIC AND TECHNICAL INPUTS FOR THE 2ND PHASE PROJECT DOCUMENT

As the project is now in its final phase with the drafting process of the Strategic Action Programme (SAP) complete and awaiting final approval by the PSC, planning for the implementation of the SAP needs to start. In order to attain GEF funding PMO is developing the 2nd Phase Project Document and the initial PIF document. For successful proposal PMO needs to identify the activities needed to implement each management action and the associated costs and source of co-funding. To achieve this, members of the 5th RWG- Fisheries will:

1. Review and familiarise themselves with the SAP Fisheries Management Actions (Annex 1)
2. Identify activities required under each management action (Annex 2).
3. Suggest inputs for 2nd Phase Project Documents

Members should review the SAP management actions and suggest activities that are required to implement each action both by the countries and PMO

Annex 1: SAP Fisheries Management Actions

Target 1 : 25-30% reduction in fishing effort¹

Management Actions1-1: Control fishing boat numbers

Reduction in fishing effort already has been implemented in the region for several years. Optional buy-back of fishing boats from fishermen will continue, a reduction of 25-30% of total marine fishing boats is recommended during 2004-2020 based on the current stock level. In addition, new boat building should be strictly controlled.

Management Action 1-2: Stop fishing in certain areas/ seasons

Closed season and areas for fishing have been used for many years. Limitation of fishing is implemented in certain areas, such as spawning and nursery grounds in the coastal waters, and is a useful measure to conserve fisheries resource. Closed seasons and areas for fishing need to be continued based on improved scientific knowledge. In China, after 12 years in practice, the summer fishing ban has been demonstrated to efficiently conserve juvenile fish stock, and should be continued. Marine protected areas for fishery resources need to be established for conservation of the spawners and genetic resources of living resources.

Management Action 1-3: Monitor and assess stock fluctuations

There is a need to improve quality of data and of stock and/or individual-level biological parameters. Stock assessment is the basis of fisheries management, and should be based on scientifically monitored data and independent information. Joint monitoring and analysis of major stocks, compatible data and assessment methodology need to be undertaken co-operatively as a demonstration of the benefits to the individual country. Establishment of regional database is recommended.

Target 2 : Rebuilding of over-exploited fish stocks

Management Action 2-1: Increase mesh size

Yellow Sea is exploited by many different types of fisheries all using different gears. The main fishing method used in the YSLME is the bottom trawl which is a fairly unselective in what it catches. Increasing mesh-size can reduce the percentage of juveniles caught. More selective fishing gears and optimum mesh-size based on the studies of gear performance and fish behaviour are recommended to reduce by-catch.

Management Action 2-2: Enhance stocks

To rebuild over-exploited stocks, degraded habitats for fishery resources will be improved by transplanting sea-grass and by controlling pollution and construction. Healthy, genetically diverse fry of high value fish and shellfish species will continue to be released into the sea in order to increase recruitment and help rebuild stocks. Designation of protected areas and building of artificial reefs in appropriate areas of the sea with suitable monitoring is

¹ Estimation of reduction required to avoid over-exploitation explained and presented at the First Yellow Sea Regional Science Conference^[69], the specification of management actions will be adjusted according to new regional knowledge, including the regional stock assessment organised under the project.

encouraged to conserve and increase fishery resources and improve their environment. Impact of the release of hatchery-raised juveniles and construction of artificial reefs on the ecosystem should be monitored and assessed.

Management Action 2-3: Improve fisheries management

Ecosystem-based fisheries management (EBFM) has been widely discussed worldwide due to the failure of single species management. Introduction of EBFM is suggested based on improved knowledge. Establishment of a self-regulation system by fishermen and community-based management in the coastal areas are recommended. Use of Total Allowable Catch (TAC) and Individual Transfer Quota (ITQ) based on survey and assessment should be encouraged in fisheries management. Fish landings should be substantially reduced to optimal levels to keep biomass at biologically safe levels. Each participating country should implement the reduction in fishing efforts to nationally acceptable level, making efforts to ensure effectiveness in securing the sustainability of provisioning services.

Target 3 : Improvement of mariculture techniques to reduce environmental stress

Management Action 3-1: Develop environment-friendly mariculture methods and technology

Yellow Sea region is one of the most productive areas in mariculture, many methods have been used. As an environment-friendly mariculture method, Integrated Multi-trophic Aquaculture (IMTA) is recommended as it will also increase economic benefit. Standard offshore technologies to different conditions should be developed. Good Aquaculture Practice (GAP) should be demonstrated at commercial scales.

Management Action 3-2: Reduce nutrient discharge

The development of mariculture in the region is the fastest in the world, in order to reduce its negative impacts on the ecosystem, limited water exchange aquaculture systems, recirculating systems are recommended to be established, and artificial diet improvement should be practiced on a commercial scale.

Management Action 3-3: Control diseases effectively

Mariculture diseases seriously affect the production. Diagnosis and control techniques for major diseases need to be developed and established. The network for an early warning and diagnosis system of diseases is suggested. New techniques and management measure to control disease should be introduced to the farmers.

5.1.1 Governance Actions

- Public awareness of the future benefits of a reduction of fishing boats, closed seasons/areas and improved regulations will bring, should be increased, especially among fishermen. A mechanism should be created to increase the public awareness of the benefits of IMTA, offshore aquaculture and limited-water exchange systems and artificial feeds.
- Alternative livelihoods should be provided until all ex-fishermen have new job opportunities, preferential taxation should be given to the fishermen who are engaged in non-fishing work, and subsidies for impoverished ex-fishermen are recommended ^[70].
- Training programmes should be encouraged to provide ex-fishermen with new

techniques, information and skills.

- Incorporation of stakeholders into the various decision-making systems related to marine resource management, coastal zone management, pollution management etc. is encouraged. Co-ordination is also desirable between scientists, managers, fishermen, farmers, government departments and countries.
- Various management measures have already been implemented. However, with the development of fisheries industries and international ocean environment, the current laws and regulations for fisheries management need to be improved to meet the requirements of today.
- Illegal fishing and mariculture should be strictly controlled. Capacity building for enforcement of relevant regulations should be increased.
- Licenses that control both farm area and species are recommended. Standards and regulations for offshore mariculture are needed to as this industry develops. Improved regulations to control nutrient discharge and diseases in mariculture are needed, and policies to discourage use of trash fish should be encouraged.
- Establishment of regional fishery scientific committee, as a subsidiary body of the YSLME Commission is recommended, to conduct joint monitoring and assessment for trans-boundary fish stock and ecosystem to evaluate trans-boundary resource and to provide advice for fishery management.

5.1.2 Indicators of management actions

The following indicators are considered for management actions that address the provisioning service function of YSLME:

- A 1/4 - 1/3 reduction in the number of motorized fishing boats by 2020 from 2004, and a harvesting level will meet the "surplus yield", implying that the stocks are kept at biologically safe levels to ensure sufficient reproductive capacity to maintain fisheries resources in a healthy condition. Recovery of some over-exploited commercial fish stocks.
- The release of billions of fry into the sea for stock enhancement after necessary evaluation in accordance with ecosystem stability.
- The establishment of at least ten protected areas for fishery resources in the Yellow Sea.
- Reduced environmental stress as a result of the widespread adoption of environment-friendly mariculture and sustainable mariculture techniques.
- Efficient operation of a network of an early warning and diagnosis system of mariculture diseases.

