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# REGIONAL COMMISSION FOR FISHERIES

## Fifth meeting of the Working Group on Fisheries Management

## Iran (Islamic Republic of), Tehran, 9-12 October 2011

# PRELIMINARY REVIEW ON STOCK AND FISHERIES STATUS INDICATORS TO BE PRODUCED FROM THE RECOFI FISHERY MANAGEMENT DATABASE

**PURPOSE**

1. The purpose of this paper is to provide information to the Working Group on Fisheries Management (WGFM) about a possible range of indicators on stock and fisheries status in the Region that could be prepared from the information submitted based on the Recommendation RECOFI/6/2011/1, entitled "Recommendation on minimum data reporting in the RECOFI area" as adopted by RECOFI at its Sixth Session (Rome, Italy, 10-12 May 2011), for the purpose of ecosystem based fishery management of the Region.

**BACKGROUND**

2. The second meeting of the RECOFI Working Group on Fisheries Management (WGFM) (Cairo, Egypt, 27-30 October 2008) reviewed the major fisheries in the RECOFI region and identified a set of species of primary concern. The meeting further recommended a pragmatic management scheme based on an Ecosystem Approach to Fisheries Management with adaptive management procedures. The fifth Session of the RECOFI (Dubai, United Arab Emirates, 12-14 May 2009) adopted this recommendation and decided to hold a workshop specifically focusing on a review of data and statistics available in the region and stock status reporting.

3. Facing the lack of information commonly accessible through the Region, the FAO/RECOFI Regional Workshop on Stock Indicators and Stock Status Reporting (Tehran, Islamic Republic of Iran, 26–29 July 2009) focused its attention on identifying key issues in the region and determining the minimum data requirement to address those key issues from the perspective of monitoring stocks and fisheries status. The concept of minimum data requirement was further developed through the 3rd meeting of WGFM (Doha, Qatar, 20-22 October 2009) and the 4th meeting of WGFM (Muscut, Sultanate of Oman, 3-5 October 2010) and the 6th session of RECOFI (Rome, Italy, 10-12 May 2011) endorsed the Recommendation RECOFI/6/2011/1, entitled "Recommendation on minimum data reporting in the RECOFI area" together with its commitment to implement on January 2012.

4. The sixth session of RECOFI also agreed to hold the workshop to develop regional management plans with agreed operational objectives and conservation measures for fisheries management as one of the priority activities for 2011-2012. Indicators to monitor stock and fisheries status would be the fundamental component in developing the RECOFI management

plans and operational objectives. The Workshop on Minimum Data Collection and Reporting (Cairo, Egypt, 10-11 July 2011) considered it useful to identify a range of indicators that could be derived from the data submitted based on the Recommendation of the Minimum Data Reporting as initial step in preparing toward the RECOFI management plans, its operational objectives and possible conservation measures.

## A RANGE OF POTENTIAL INDICATORS

5. General objective of ecosystem approach of fishery management is to secure long-term sustainability of whole ecosystems, including human community. From fishery view point, this can be translated into a long-term sustainability of i) healthy ecosystem, especially of healthy status of fishery resources, ii) food security, and iii) social and economic contribution of ecosystem, specifically through fishery activities. In this regards, some of potential indicators include:

Healthy ecosystem and fishery resources:
- Amount of catch (when no constraints in efforts) **
- Trend in catch per unit effort **
- Species composition, occurrence of vulnerable species[1] **
- Size composition, or mean size of total catch +
- Abundance of priority species of interest or vulnerable species **

Food security:
- Amount of production **
- Amount of consumption
- Proportion of discards **
- Proportion of non-food use

Social and economic contribution:
- Number of primary employments *
- Number of secondary and tertiary employments
- Values added by fishery sector *
- Values added by fishery products through value chain
- Employment and value produced through non-fishery use of ecosystem

6. Here, the marks shows current capacity to produce such indicators based on the RECOFI capture database and the information to be submitted under the Minimum Data Reporting, indicating '**' fully capable, '*' partially capable, and '+' potential to estimate with minor additions and/or modifications, respectively. The same marks would be applied throughout this paper.

7. At the same time, the RECOFI specifically identified three main monitoring priorities in order to effectively detect possible deteriorations of ecosystem and fisheries resources of primary concerns, i.e. ecosystem-wide impacts of shrimp trawls, status of coastal finfish resources using groupers and emperors (identified as most vulnerable) as reference indicators of fishing pressure, and stock status of priority species, narrow-barred Spanish mackerels, as the first target. Minimum data reporting was developed to monitor those three components and targeted indicators as well as potentially useful indicators in addition under each category include:

[1] 'vulnerable species' here indicate those species that are more sensitive to exploitation pressure generally due to low productivity, slow growth and/or other ecological characteristics.

Impacts of shrimp trawls

*Targeted indicators:*

- Amounts of efforts (in total tows duration and number of fishing days) **
- Species composition of by-catch (in a sense of non-targeted catch, i.e. catch other than shrimps) **
- Amount of discards and its composition, if possible *
- Comparison of cost and benefits among fleet segments *
- Evaluation of effectiveness of mitigation devices *

*Other potentially useful indicators:*

- Extent of area of operations +
- Status indicators of major by-catch species **
- Evaluation of relative economic benefits in comparison with potential loss (through bycatch, deterioration of habitat, etc) +

Status of coastal finfish stocks with groupers and emperors as reference species groups

*Targeted indicators:*

- Amounts of efforts of three main gears (in number of fishing days) **
- Status indication of groupers and emperors through CPUEs of three main gears **
- Proportion of groupers and emperors catches by each gear **
- Species composition within species groups of groupers and emperors *

*Other potentially useful indicators:*

- Mean size of catch of groupers and emperors +

Stock status of narrow-barred Spanish mackerel

*Targeted indicators:*

- Amounts of efforts **
- Status indication through CPUEs **
- Abundance estimates *

*Other potentially useful indicators:*

- Evaluation of abundance estimates and their projections +

8. Adaptive fishery management requires monitoring of at least two components; one is on target objective, e.g. status of fishery resources and ecosystems, and the other on targets to control, e.g. fishing efforts, in other words, responses and actions. At the same time, ecosystem approach of fishery management is targeting toward sustainability of ecosystem and communities as a whole. Sustainability of fishery resources and ecosystem is an essential condition to achieve this objective, but not the only goal, and it is necessary to figure out proper balance among conflicting goals. It should be noted that some indicators could serve multiple roles, such as action indicator for one aspect and response indicator for other aspect. This paper only provides an extremely brief overview on current situation and the final set of standard monitoring indicators should be determined according to the management goals and its operation plans.

**SUGGESTED ACTION BY THE WORKING GROUP**

9. The Working Group is invited to review a range of indicators and to plan toward development of the RECOFI management plans, its operational objectives and possible conservation measures and corresponding monitoring indicators. Specifically, the Working Group is invited to comments on:

- what are the primary objectives of fishery management in the Region;
- whether the current data collection and sharing is adequate to establish fishery management operational plans to monitor and achieve those objectives, especially in the areas other than monitoring sustainability of ecosystem and fishery resources; and
- work plans toward developing and establishing the RECOFI fishery management scheme with management procedures, operational plans and corresponding indicators.