# Management advisory for the Bay of Bengal Indian mackerel fishery

What is the BOBLME RFMAC

The BOBLME Project is supporting countries to implement an ecosystem approach to fisheries management of shared fishstocks in the Bay of Bengal. The EAFM framework has three tiers: working groups to provide technical information; a Regional Fisheries Management Advisory Committee (RFMAC) - to interpret the information and deliver ecosystem based fisheries management advice; and a Regional Fisheries Management Forum (RFMF) to deliberate on the advice and make decisions for national actions. The RFMAC comprises members from the eight BOBLME countries, SEAFDEC, FAO, BOBP-IGO and IUCN.
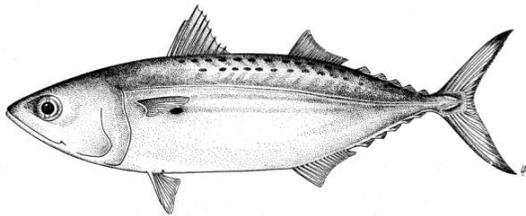
Indian mackerel (*Rastrelliger kanagurta*)

Major recommendations

1. **Improve the catch statistics for Indian mackerel.**

2. **Through the BOBLME Project, complete the genetics study to determine the stock structure of Indian mackerel in the Bay of Bengal**

3. **Establish in-country multi-agency committees to monitor the implementation of the national Indian mackerel management plans.**

Key messages

Indian mackerel is a relatively cheap nutritious fish that is important in food security in the Bay of Bengal countries

The stock status is uncertain. Annual catches have been relatively stable over the period 2003-2007 at between 100,000 and 120,000 t. However, catch statistics are not up to date and figures for the last 5 years are not available.

There is an urgent need to better understand the stock structure and improve catch statistics for Indian mackerel'

The BOBLME countries have made a range of key decisions relating to the development of the BOBLME Strategic Action Programme which will address the major issues relating to overexploitation of marine living resources. The above recommended actions are specific to the hilsa fishery and should be implemented in conjunction with the wider ranging actions that are intended to address the (i) *decline in overall availability of fish resources; (ii) changes in species composition of catches; (iii) high proportion of juvenile fish in the catch; and (iv) changes in marine biodiversity.* Please refer to the back page of this document for more information.

Ecosystem Status

Biological status of Indian mackerel (regional stock)

- **Stock status is unknown**

Management options and consequences:

Through the BOBLME Indian mackerel working group, clarify the stock structure of the Indian mackerel in the Bay of Bengal. Undertake a quantitative stock assessment to estimate management targets. Consequences: none (the work is currently funded)

What impact is the fishery having on the environment

- **There no major impacts on the seabed or water column**

Management options and consequences:

No immediate actions required: monitor the situation

What impact is the fishery having on endangered, threatened and protected species

- **Indian mackerel fishers catch sea turtles in bottom trawls and larger-mesh gillnets; and sharks in large purse seines**

Management options and consequences:

Monitor the catches of ETP species and include ETP species in an awareness programme. Consequences: monitoring and programmes will require funding

What impact is the fishery having on other species

- **The stock status of other retained species landed with Indian mackerel, especially in trawl and purse seine fisheries is poorly known**

Management options and consequences:

Through the BOBLME Indian mackerel working group, monitor the composition of fish species taken in the fishery (for example, using a trophic index).

What external factors threaten the fishery

- **Pollution of coastal waters may have sub-lethal effects on the fishstock**

Management options and consequences:

No immediate actions required: establish contacts with relevant pollution control agencies, obtain information on pollution levels and monitor the situation.

Socio-economic issues

In Sri Lanka, Tamil Nadu, West Bengal, Thailand and Indonesia catches of Indian mackerel are low (compared to total national landings), and the socio-economic importance of Indian mackerel fisheries may be small in terms of total employment and income generation.

Small pelagics such as Indian mackerel are a relatively low cost protein source for consumers. Indian mackerel serve an important socio-economic role in terms of food security

Regional Fisheries Management Advisory Committee
Advisory on the regional Indian mackerel fishery

Governance issues

Current management

- **There is no coordinated regional management of the Indian mackerel stock**

Management options and consequences:

National fisheries agencies develop and implement national Indian mackerel (or small pelagics) management plans.
Consequence: this will require allocation of resources.
Development of a regional management plan is part of the BOBLME Project objectives and should be available in 2013.

Implementation of an ecosystem approach to fisheries management

- **Supported by the BOBLME Project**
- **BOBP-IGO provides training on the Code of Conduct for Responsible Fisheries (the basis of EAFM)**

Management options and consequences:

Enable fisher representation in fisheries management. Consequences: funding and resources will be required in fisheries management agencies to facilitate consultations

Provide further capacity development and increase broad stakeholder awareness on EAFM. Consequences: Awareness and training programmes will need funding and coordination

Data and information

- **There are no integrated data management or collection activities for Indian mackerel**
- **There is little catch and effort data on Indian mackerel especially as catch and effort information is aggregated with that of other species.**

Management options and consequences:

Improve catch and effort statistics and the stock assessment of Indian mackerel. Consequences: this will require the allocation of resources to national catch sampling regimes and the functioning of the BOBLME Indian mackerel working group. And greater participation of private sector in provision of data.

Legal tools and compliance

- **Enforcement of existing and future fishing regulations is weak in some areas**

Management options and consequences:

Increase compliance with fishery regulations pertaining to the small pelagic fisheries through awareness programmes and strengthening enforcement capacity. Consequences: this will require additional resources

Governance issues (continued)

Marine protected areas

- Bangladesh has around 1400 km^2 of MPA (over 0.05% of its EEZ); India has around 12,300 km^2 of MPA (over 0.5%); Indonesia has around 5100 km^2 of MPA (about 0.2%); Malaysia has around 350 km^2 of MPA (about 0.01%); Maldives has around 92 km^2 of MPA (about 0.004%); Myanmar has around 340 km^2 of MPA (about 0.01%); Sri Lanka has around 2500 km^2 of MPA (about 0.1%); and Thailand has around 5000 km^2 of MPA (about 0.2%).
- Overall, the degree to which these MPAs contribute to the protection of the Indian mackerel stock is not known.

Management options and consequences:
Incorporate fisheries objectives in the design and management of MPAs by improving collaboration and dialogue between the agencies responsible for fisheries and MPAs.

Promote community consultation in MPA design and establishment. Consequences: consultation programmes will need funding and coordination

Institutional structure

- Linkages between the main agencies that need to be involved in Indian mackerel management (fisheries, environment water management and pollution control authorities) are weak.

Management options and consequences:
Establish in-country multi-agency committees to monitor the implementation of the national Indian mackerel (or small pelagics) management plans.

Through the BOBLME project, countries convene a regional Indian mackerel management forum to consider the advice of the RFMAC and monitor the implementation of a Regional Indian mackerel Management Plan.

BACKGROUND
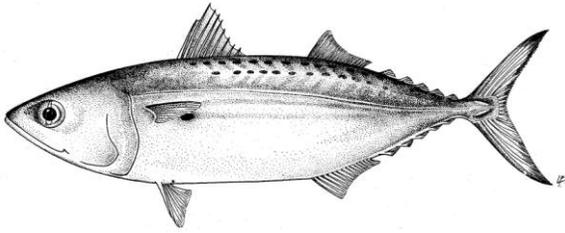
(Source: FAO)

Introduction

Indian mackerel (*Rastrelliger kanagurta*) is found at depths of 0-150 m, often near the thermocline. Adults live in coastal bays, harbors and deep lagoons, usually in turbid plankton-rich waters. Indian mackerel form schools, and feed on phytoplankton (diatoms) and small zooplankton. Adults feed on macro-plankton such as larval shrimps and fish. The Indian Mackerel eggs and larvae are pelagic. Spawning typically starts around April-May and continues until September.

Indonesia, Malaysia, Thailand and Myanmar have targeted purse seine fisheries for small pelagics, including Indian mackerel, with other gears such as bottom otter trawling and gill nets taking this species as a retained bycatch. In the western BOBLME countries (India and Sri Lanka) catch Indian mackerel as part of their small scale coastal gill net and beach seine fisheries.

The minimum total catch estimate is around 174,570 t in 2009 (India 58,097 t, Myanmar14,207 t, Thailand 23,337 t, Indonesia 20,000 t, Sri Lanka 400 t, Malaysia 56,520 t, catch estimates for Bangladesh and Maldives are not available).

Stock status

Stock status of Indian mackerel is uncertain; and in the eastern areas of the Bay of Bengal, Indian mackerel may be confused with the short mackerel (*Rastrelliger brachysoma*).
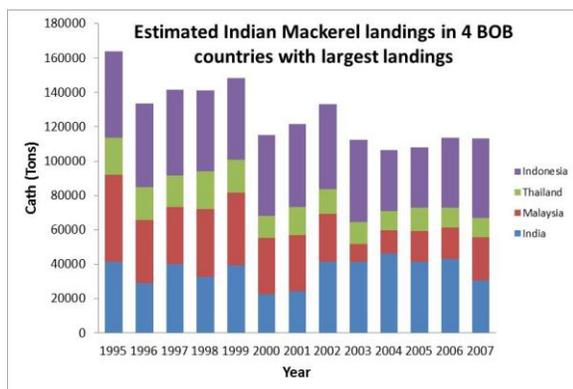

Figure 1: BOBLME Indian mackerel landings by country.

Catches by the four major Indian mackerel catching countries appear to have decreased slightly since 1995,

while they have been relatively stable over the period 2003-2007 at between 100,000 and 120,000 t. However, catch statistics are not up to date and figures for the last 5 years are not available.

Preliminary assessment of the CPUE data from India indicates that the stock is healthy in India; while FISAT based techniques indicate that the stocks maybe overexploited in Malaysia and Thailand. Without knowing the underlying stock structure, it is difficult to understand the overall status of the stock in the Bay of Bengal Region.

Socio Economic Issues

In Sri Lanka, Tamil Nadu, West Bengal, Thailand and Indonesia catches of Indian mackerel are low (compared to total national landings), and that the socio-economic importance of Indian mackerel fisheries may be small in terms of total employment and income generation.

Small pelagics such as Indian mackerel are generally low cost to consumers, and have high micro-nutrient content as well as providing an important source of animal protein. They thus serve an important socio-economic role in terms of food security

Ecosystem Issues

The purse seine fleet that lands Indian mackerel predominately operates in the Eastern Bay of Bengal countries including Indonesia, Malaysia, Thailand and Myanmar. These fleets a target a range of pelagic species including tunas. Indian mackerel is also landed as a bycatch by bottom otter trawlers operating in Indonesia, Malaysia, Myanmar and India. The species is caught principally by vessels targeting shrimp, squid and various demersal fish. Gill nets operated by smaller vessels in Sri Lanka and India land a mixture of small pelagics. Beach seines operated from shore in Sri Lanka also land a mixture of small pelagic including sardine species.

Gill nets and beach seines pose a low risk to species caught in association with Indian mackerel; however, on the east coast of India the immature scombrids caught in association with mackerels using small-mesh (60-100 mm) are at risk. So while retained fish in the gill net and beach seine fisheries in India and Sri Lanka are reasonably resilient to overfishing, it appears that increases in effort need to be considered with caution.

No verification or information on the species associated with the gill net fisheries in Indonesia and Malaysia have been available. It is understood that they are targeting a range of demersal species using bottom set gill nets.

Recommended BOBLME Strategic Action Programme actions to address the over exploitation of living marine resources.

Under the auspices of the BOBLME Project, the BOBLME countries have made a range of key decisions relating to the development of the BOBLME Strategic Action Programme (SAP) which will address the major issues relating to overexploitation of marine living resources; degradation of critical habitats; and pollution and water quality.

In 2012, the countries adopted a Transboundary Diagnostic Analysis (TDA) as the factual basis for the development of the Strategic Action Programme.

The Strategic Action Programme has the following objectives:

Regional Environmental Objective:

A healthy ecosystem and sustainable use of marine living resources for the benefit of the countries of the Bay of Bengal Large Marine Ecosystem

Ecosystem Quality Objectives relating to the following themes:

1. Overexploitation of marine living resources:

Fisheries and other marine living resources are restored and managed sustainably.

2. Degradation of critical habitats:

Degraded, vulnerable and critical marine habitats are restored, conserved and maintained.

3. Pollution and water quality:

Coastal and marine pollution and water quality are controlled to meet agreed standards for human and ecosystem health.

Priority Objectives for the Overexploitation of marine living resources are:

- Restore transboundary fisheries resources that have declined
- Restore and maintain species composition
- Reduce the proportion of juvenile fish caught and/ or retained
- To restore biodiversity status to 1980 level by 2020

In order to achieve these objectives, a wide range of actions have been identified covering the following areas:

- Institutional arrangements
- legal and policy reforms
- management measures
- enforcement and compliance
- awareness and communication
- information strengthening
- capacity development.

More information on the specific actions is available in the draft Strategic Action Programme which can be accessed on the BOBLME website (www.boblme.org) or from the BOBLME Regional Coordination Unit.