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Session 17

FISH AND FISHERIES OF ESTUARIES OF THE EAST COAST OF INDIA

DEV

INTRODUCTION

- The major estuarine systems in India are the Hooghly-Matlah estuarine system in West Bengal; the Mahanadi and Rushikulya estuary in Orissa; the Godavari and the Krishna in Andhra Pradesh; the Adyar, the Cauvery, Vellar and Vaigai estuaries in Tamil Nadu, the Narmada and the Tapti in Gujarat, Asthamudi in Kerala, Kalinadi in Karnataka and Mandovi – Zuari system of Goa.
- The important brackishwater lakes of the country are the Chilka lake in Orissa, the Pulicut lake and Killai backwaters in Tamil Nadu and Cochin and Vembanad backwaters in Kerala.

- Though the fisheries of various estuarine systems have been studied in the last two decades, a continuous monitoring of the fisheries is done only in the Hooghly-Matlah estuarine system, the largest estuarine complex in India. The following estuaries are the important estuaries situated along the east of India.

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□ **Mahanadi Estuary**

□ **Rushikulya Estuary**

□ **Godavari Estuary**

□ **Krishna Estuary**

□ **Cauvery Estuary**

□ **Adyar Estuary**

□ **Vellar Estuary**

□ **Vaigai and its adjacent estuaries**

The Hooghly-Matlah estuary

- The Hooghly-Matlah estuary, which is located within the State of West Bengal, occupies the **marshy deltaic area called the Sunderbans**. Sunderbans at the Ganga-Brahmaputra delta are regarded as the largest single mangrove jungle of the world transcending the political boundaries of India and Bangladesh and occupying a total of 10,000 km². The portion falling in India occupies over 4,170 km² (23,400 ha). The total approximate area of Sunderbans estuarine waters is 2,340 km².
- The main Hooghly estuary is a **positive estuary**. It has an approximately triangular wide mouth and, probably, due to the strong scouring action of the stream as well as tidal currents, a greater overall circulation is maintained. The tidal influence can be realized up to a distance of 290 km from the sea.

□ Fish and Fisheries

Among the estuaries of India, Hooghly-Matlah estuarine system provides one of the richest grounds for fishery in India. About 130 species of fishes and 30 species of prawns and crabs are found in the commercial catches obtained from the Sunderbans area.

Nearly 16,000 fishermen live in different zones of the estuary, and fishing activity goes on intensively throughout the year and the total annual catch amounts to 20,000 – 26,0000 tonnes. The fish fauna of the Hooghly-Matlah is classified into residents and transients or migrants.

□ Resident species

- Mulletts: *Liza parsia* and *L. tade*,
- Threadfins: *Polynemus tetradactylus* and *P. indicus*
- Croakers: *Sciaena miles* and *Sciaenoides barites*
- Perches: *Lates calcarifer*
- Ribbon fish; *Trichiurus saval*
- Clupeids: *Setipinna taty* and *Ilisha elongate*, *Setipinna phasa* ,
Hilsa sinensis and *Coilia borneensis*, *Coilia ramcarati*
- Catfish: *Tachysurus jella* and *Plotosus canius*
- Other species include *Harpadon nehereus*, *Polynemus paradieus*,
Pama pama and *Sillaginopsis panijus*.

□ Migrants

The Hooghly-Matlah estuary serves as a nursery for migrant species providing spawning grounds for many, which show anadromous or catadromous types of migrations.

These species can be broadly divided into **four categories**.

1. Marine forms that migrate upstream and spawn in freshwater areas of the estuary are: *Tenualosa ilisha*, *Polynemus paradiseus*, *Sillaginopsis panijus* and *Pama pama*.

2. Freshwater forms that migrate downstream and spawn in the sea (catadromous fishes) are *Anguilla* spp (Freshwater eel)

3. Freshwater species which spawn in saline areas of the estuary are: *Pangasius pangasius* and the prawn, *Macrobrachium rosenbergii*.

4. Marine fishes that spawn in the saline areas of the estuary are: *Tachysurus jella*, *Osteogeneiosus militaris*, *Polynemus indicus* and *P. tetradactylus*. These species spawn in areas where salinity ranges between 1.0 and 26.0 ‰. The young, after a brief sojourn, lasting a few months, return to the sea with the onset of monsoon.

- The young ones of many marine species of prawns and fishes such as *Penaeus indicus*, *P. carinatus*, *Leander stylifera*, various sciaenids, ribbon fishes, etc. **migrate for feeding into the lower zone of the estuary** during the winter and summer months and return to the sea when the salinity of the estuary goes down with the onset of monsoon.
- In this estuary, prawn fishery dominates the fish catches, contributing as high as 30 to 40% to the total landings. The commercially important species of the Hooghly-Matlah estuary are *Tenualosa ilisha*, *Lates calcarifer*, *Polynemus paradiseus*, *Liza parsia*, *L. tade*, *Polynemus indicus*, *Pama pama*, *Sillaginopsis panijus* and prawns.

Status of Hilsa fishing in Hooghly – Matlah estuary

- Hilsa fish, *Tenualosa lisha*, a remarkable fish of Hooghly estuary. It deserves importance because of its unique taste, popular preference and high market price.
- It ranks as the prime fish and commercially it constitutes the most important fishery of the ecosystem. During monsoon (July to October) period hilsa catch contributes to the bulk (about two third) of the total annual landing of the species from this estuary.
- The hilsa fishery in winter, however, is of a smaller magnitude. Wide fluctuations in *hilsa* catch in Hooghly estuary has an interesting characteristic.
- Available information depicts that the harvested yield of the upper portion of the estuary is in a declining trend.

- Hilsa, the most important **anadromous** specific attention in studies as the fish migrates during monsoon from sea to the riverine water bodies.
- Human use of river systems has intensified considerably in the last century due to increasing population and the associated higher demand for water through industrial and agricultural technologies. The upper stretch of Hooghly estuary is greatly involved with earnings of the fishermen residing nearby river side.
- Fall in hilsa catch has deprived the fishermen from availing of hilsa catches at least from the upper stretch of the estuary due to indiscriminate killing of juveniles. *Hilsa* juveniles (fry and fingerlings) constitute a substantial part of hilsa catch from the upper freshwater stretch. Young hilsa, which start their downward migration, are trapped by small meshed nets.

□ Fishing gears used

Among the various types of gears used, **bagnets** are the most common and these are particularly designed for their operation in tidal areas. Nearly 4000 bagnets of different mesh sizes are operated in the estuary.

Other gears employed are trawl net, large seine, small seine, purse seine, drift net, lift net, cast net, set-gill net, set-barrier, traps and hooks and lines. Winter season yields the best results. Prawns and Bombay duck form more than half of the bagnet catches. Of the total landings, the bagnet fishery contributes about 70% from the estuarine areas.

□ Conservation and management

The **overall decline** in the salinity of Hooghly-Matlah estuarine system after commissioning of the **Farakka Barrage** with gradient and marine zones being pushed down towards the sea. This has brought about drastic changes in the species composition of fishes caught with freshwater species making their appearance in tidal zones at the cost of some neritic species.

This major estuarine resource of the country has also been subjected to **stresses like urbanization, pollution, land development, dams, degradation and over exploitation** in some areas. Further, exploitation by very small meshed nets may affect the concerned stocks. This situation may lead to depletion of stocks and hence it is necessary to take appropriate regulatory measures.