

AGRICULTURE TOPIC FISHERIES

For NABARD,BHU,JRF,SRF,NET,SET

Download App for More
Agriculture Notes.



← Google Play



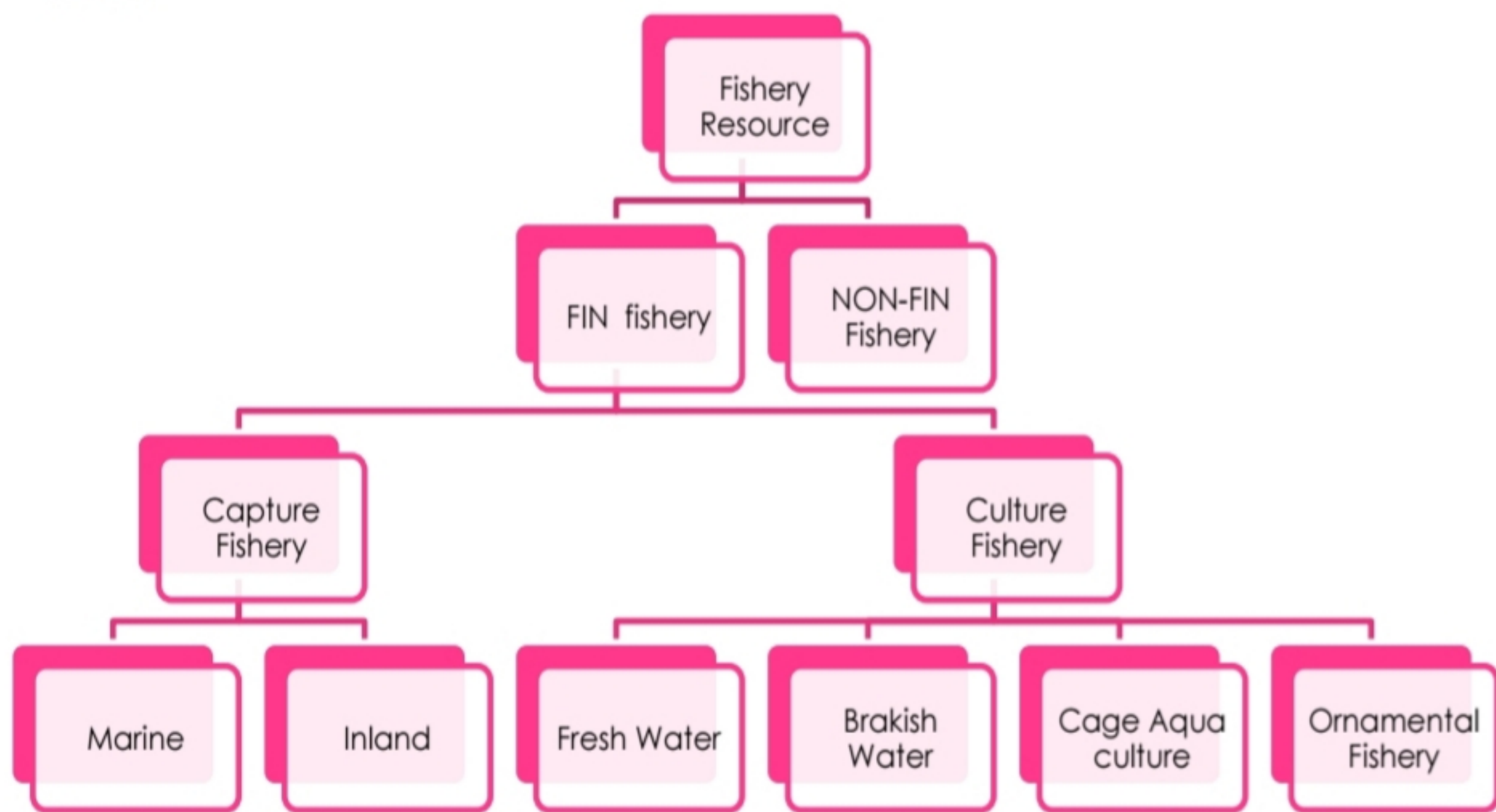
Agriculture
Student (Notes, Agri
Jobs) Agrilearner
techno India

Education

UNINSTALL

OPEN

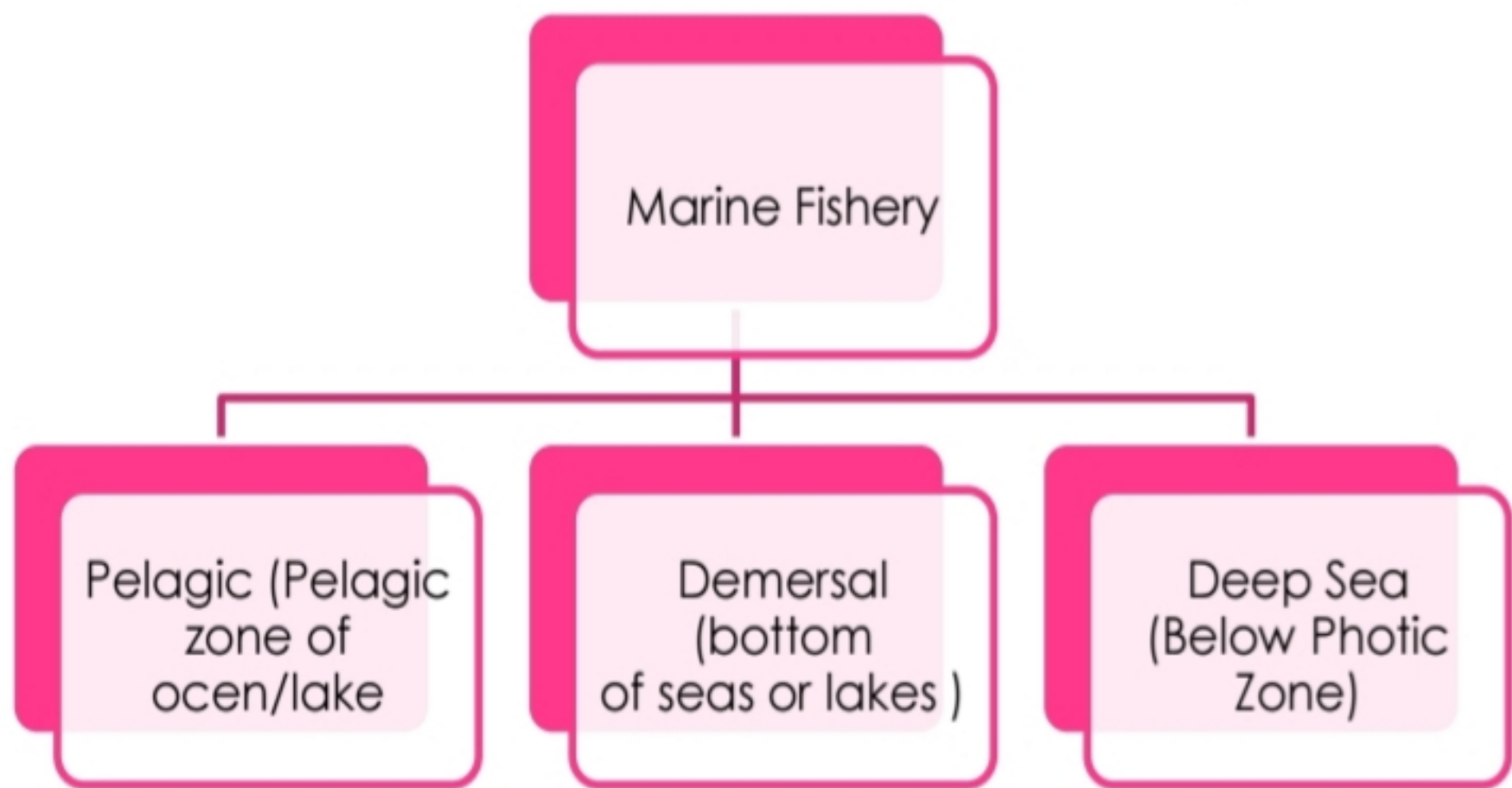
Fisheries: Fisheries resources, management and exploitation - freshwater, brackish water and marine



Marine Fishery

Can be majorly Classified into two three groups

Agrilearner App
{1}



Pelagic Fish

- Pelagic fish live in **the pelagic zone of ocean or lake waters** - being **neither close to the bottom nor near the shore** - in contrast with demersal fish, which do live on or near the bottom, and reef fish, which are associated with coral reefs.
- Marine pelagic fish can be divided into - **Pelagic coastal fish & oceanic pelagic fish.**

Demersal Fish

- Demersal fish **live and feed on or near the bottom of seas or lakes** (the demersal zone). They occupy the **sea floors and lake beds**, which usually consist of mud, sand, gravel or rocks.

- Demersal fish can be divided into two main types: strictly **benthic** fish which can rest on the sea floor, and **benthopelagic** fish which can float in the water column just above the sea floor.

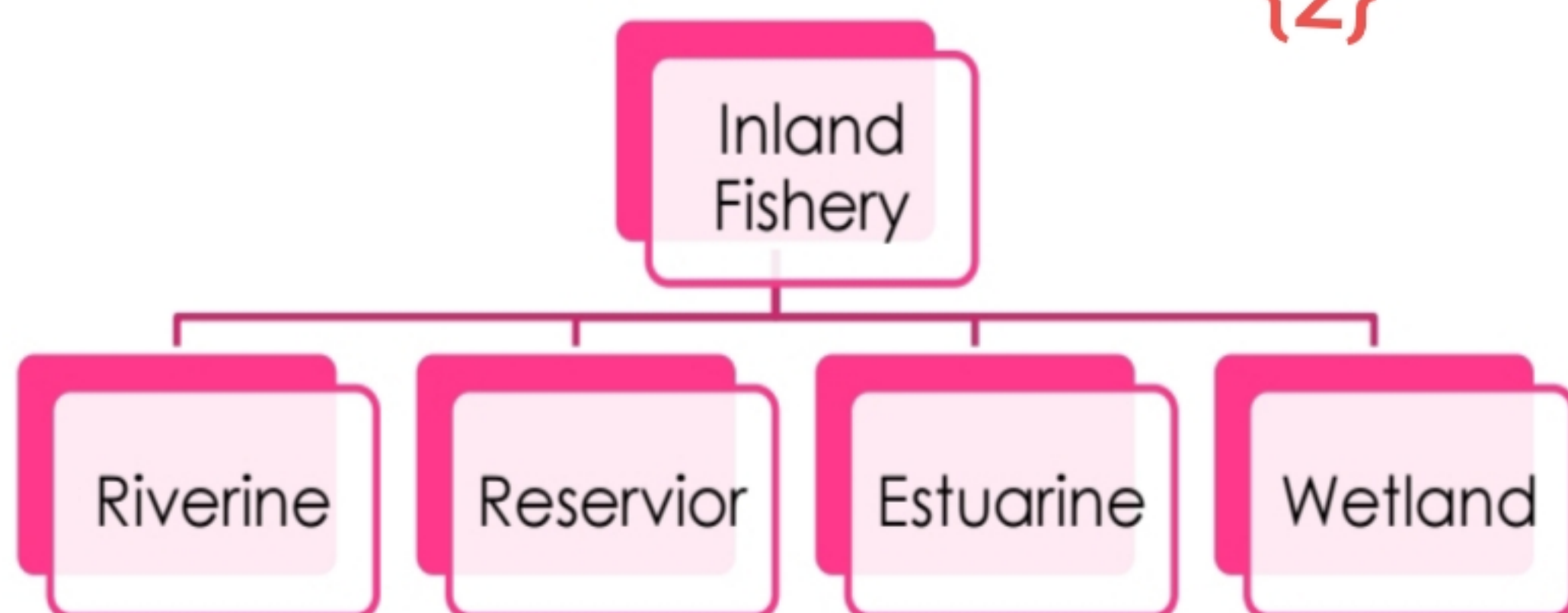
Deep sea fish

- Deep-sea fish are fish that live in the **darkness below the sunlit surface waters**, that is **below the epipelagic or photic zone of the ocean**. The **lantern fish** is, by far, the most common deep-sea fish.
- Deep-sea organisms generally inhabit **bathypelagic** (1000m-4000m deep) and **abyssopelagic** (4000m-6000m deep) zones.
- However, characteristics of deep-sea organisms, such as **bioluminescence** can be seen in the **mesopelagic (200m-1000m deep) zone** as well.
- The mesopelagic zone is the **disphotic zone**, meaning **light there is minimal but still measurable**.
- The **bathypelagic** and **abyssopelagic zones** are **aphotic**, meaning that **no light penetrates** this area of the ocean.

Inland Fishery

It can be classified into **four groups**

Agrilearner App {2}



Riverine

- India is blessed with vast **inland water resources in the form of rivers, estuaries, natural and manmade lakes**.
- The Inland water bodies have been divided into five riverine systems and their tributaries extending to a length of about 29,000 km in the country – Indus, Ganges, Bramhaputra, East flowing riverine system and West riverine system.

Ganga River System

Fisheries of Ganga river systems: The Ganga river system supports a large number of commercially important fish species-

- Major carps (Labeo rohita: L.Calabasu, Catla catla and Cirrhinus mrigala)
- Minor carps (Labeo fimbriatus; L.bata; Cirrhinus. reba),
- Catfishes (Wallago Attu; Mystus. aor; M.tengara, Clarias. batrachus; Heteropneustes fossilis);

- Clupeids, murrels (*Channa species*), feather backs (*Notopterus. notopterus*; *N.chitala*), mullets (*Mugil corsula*);
- Fresh water eel (*Anguilla*) and prawns (*Macrobrachium malcolmsonii*; *Palaemon. Lamarii*).
- **Fishing gears used:**

The principal gears used in Ganga river system are dragnets, cast nets and bag nets.

Godavari River System

The head waters harbour a variety of game fishes but don't support the commercial fisheries. The commercial fisheries consist of carps (major caps, *Labeo fimbriatus*), large cat fish (*Mystus spp.*, *Wallago attu*; *Bagarius bagarius*) and fresh water prawn (*Macrobrachium rosenbergii*)

Other River systems include

Krishna, Cauveri, Narmada etc

Agrilearner App
{3}

Reservoirs

The man-made water bodies created by obstructing the surface flow or erecting a dam of any description, on a river, stream or any water course called reservoirs. The small reservoirs have an area of <1000 ha.

Assessment of yield potential

Several methods are in vogue to assess the fishery potential of small reservoirs, based on area, depth, catchment area and the chemical characters of soil and water.

Morpho-edaphic index (MEI) was evolved in **an attempt to combine the morphometric** as well as **chemical parameters**.

A **Morpho-edaphic index** may be computed as

MEI = Specific conductivity ($\mu\text{mhos cm}^{-1}$) per unit mean depth (m)

For Indian reservoirs it has been used to estimate fish yield potential as:

$$C = 3.984 \text{ MEI}^{0.6374}$$

Stocking rate - Fish stocking is the practice of raising fish in a hatchery and releasing them into a river, lake, or the ocean to supplement existing populations, or to create a population where none exists

Estuarine

An **estuary** is defined as a **semi-enclosed coastal body of water**, which has a **free connection** with the **open sea** and within which the seawater is measurably diluted with the freshwater of land drainage.

Wetland Fishery

It includes following two groups

- Capture fishery for open wetlands
- Culture-based fishery for closed wetlands

Fresh water Aquaculture

Carp	Carp are various species of oily freshwater fish from the family Cyprinidae, a very large group of fish native to Europe and Asia.
Prawn	
Murrel	
Cat fish	

Carp

Species Suitable for Farming

The commonly cultivated six species - Catla (Catla catla), Rohu (Labeo rohita), Mrigal (Cirrhinus mrigala), Silver carp (Hypothalmichthys molitrix), Grass carp (Ctenopharyngodon idella) and Common carp (Cyprinus carpio) are considered to be the best culturable species of fishes in the inland water system.

Species Feeding Habit and Feeding Zone-

Agrilearner App
{4}

Indian Major Carps

Catla	Zooplankton feeder	Surface feeder
Rohu	Omnivorous	Column feeder
Mrigal	Detritivorous	Bottom feeder

Exotic Carps

Silver carp	Phytoplankton feeder	Surface feeder
Grass carp	Herbivorous	Surface, column & marginal areas
Common carp	Detritivorous/Omnivorous	Bottom feeder

Carp culture

Selection of pond

The main criteria to be kept in mind while selecting the pond is that the soil should be water retentive, adequate supply of water is assured and that the pond is not in a flood prone area.

Pond Management

- Carp culture in ponds is basically a three-tier culture system where the first step begins with the rearing of spawn up to fry (2–3 cm) stage for 2–3 weeks in nursery ponds
- Followed by rearing of 2–3 weeks old fry for about 3 months up to fingerling stage (8–12 cm) in rearing ponds
- Finally released in stocking ponds for growing up to table size fish.

Techniques of management involve

Broadly, the various steps involved in the management of ponds at all the three stages of culture may be classified as

- (i) pre-stocking
- (ii) stocking and
- (iii) post-stocking management operations

Agrilearner App
{5}

Preventive control

The preventive measures have to be taken well in advance. The measures include trimming of pond margins, dewatering and desilting of old ponds, uprooting or burning of dried marginal weeds during the summer and providing barriers to prevent the entry of floating weeds.

Manual and Mechanical control

The free-floating groups of weeds are either handpicked or dragged by wire or strong coir rope nets. In bigger ponds they should be removed part by part from the marginal areas and finally the centrally located weed mass is dragged towards the banks and lifted out.

Chemical control: Apart from Manual and Mechanical control, we can also spray certain chemicals.

Common weed eating fish and the weeds of their preference.

Fishes	Names	Feed upon
Common carp	<i>Cyprinus carpio</i>	Tender shoots
Gaurami	<i>Osphronemus goramy</i>	Tender shoots of submerged weeds and filamentous algae
Pearl spot	<i>Etroplus suratensis</i>	Filamentous algae
Grass carp	<i>Ctenopharyngodon idella</i>	Submerged weeds e.g <i>Hydrilla</i> , <i>Najas</i> , <i>Ceratophyllum</i> , <i>Potamogeton</i> , <i>Ottelia</i> and duck weeds
Silver carp	<i>Hypophthalmichthys molitrix</i>	Algal bloom

Fish toxicants: Recommended doses of fish poison

Poison	Dose (kg/ha/m)
Bleaching powder	350 – 500
Mohua oil cake	2500
Anhydrous ammonia	20 – 30
Powdered seed of <i>Croton tiglium</i>	30 – 50
Root powder of <i>Milletia pachycarpa</i>	40 – 50
Seed powder of <i>Milletia piecidia</i>	40 – 50

Seed powder of <i>Barringtonia acutangular</i>	150
Seed meal of tamarind (<i>Tamarindus indica</i>)	1750 – 2000
Tea seed cake (<i>Camellia sinensis</i>)	750

Liming

- The tanks, which are acidic in nature, are less productive than alkaline ponds. Lime is used to bring the pH to the desired level.
- The normal doses of the lime desired ranges from 200 to 250 Kg/ha.

However, the actual dose has to be calculated based on pH of the soil and water as follows:

Soil Ph	Lime (kg/ha)
4.5-5.0	2,000
5.1-6.5	1,000
6.6-7.5	500
7.6-8.5	200
8.6-9.5	Nil

Agrilearner App
{6}

Fertilization

Fertilization of the pond is an important means of intensifying fish culture by increasing the natural productivity of the pond. The fertilization schedule has to be prepared after studying the quality of the pond soil. A combination of both Organic and Inorganic fertilizers may be used for best results.

Harvested fish catch

- It has been experienced that even under the best management, Indian major carps on an average attain hardly 1 kg in size in a year, while Chinese carps reach over 2 kg
- Usually fish over 500 g should be harvested every 3–4 months with simultaneous stocking with fingerlings

Prawn Culture

The giant freshwater prawn is suitable for cultivation in tropical and subtropical climates. The most commonly cultured species in India is *Macrobrachium rosenbergii*.

Stocking

- The stocking density normally varies from 4000 to 50000 PL/ha depending on the type and intensity of the management practices.

Harvesting

Basically, there are two methods of harvesting: **cull-harvesting** **drain harvesting**

Brackish water fishery

Water quality

Site should have good pollution free water supply of both freshwater and brackish water. Water quality parameters required for maximum feed efficiency and maximum growth of *Penaeus monodon* are given below:

Water Parameters	Optimum level
Dissolved Oxygen	3.5-4 ppm
Salinity	10-25 ppt
Water Temperature	26-32 (°C)
pH	6.8-8.7
Total nitrite nitrogen	1.0 ppm
Total ammonia (less than)	1.0 ppm
Biological Oxygen Demand (BOD)	10 ppm
Chemical Oxygen Demand (COD)	70 ppm
Transparency	35 cm
Carbon dioxide (less than)	10 ppm
Sulphide (less than)	0.003 ppm

Agrilearner App
{7}

Soil Conditions

The type of soil is the most critical in site selection, since the shrimp will spend most of their time on the pond bottom during the culture period. Usually, clay or loam-based soil containing more than 90% clay and pH between 6.5-8.5 is preferable

Stocking

- The most suitable species for culture in India are the Indian white prawn *Penaeus indicus* and tiger prawn *P. monodon*.
- As per the directives of Supreme Court only traditional and improved traditional shrimp farming can be undertaken within the Coastal Regulation Zone (CRZ) with a production range of 1 to 1.5 t/ha/crop with stocking density of 40,000 to 60,000/ha/crop. Outside CRZ extensive shrimp farming with a production range of 2.5 to 3 t/ha/crop with stocking density of 1,00,000/ha/crop may be allowed.

Methods of Harvesting

- Two methods of harvesting are generally practiced on farms.
- These are either by draining the pond and catching the shrimp in a bag net or by netting the shrimp within the pond.

- The proportion of soft shell shrimp should not be more than 5% at the time of harvest.

Marine Fishery

Cage farming in India

- As an R & D activity, the first open sea cage was launched in Bay of Bengal off **Visakhapatnam** coast during May 2007.
- Due to the rough sea conditions, the first version of the cage had lasted only for 45 days in the sea. With further modifications, the second version of marine cage was fabricated involving marine engineering and naval diving experts and was launched in December 2007.
- With a low stocking density, the trial was successfully completed in April 2008.

Size

- CMFRI has developed open sea cages of 6 m dia and 15 m dia for grow out fish culture and 2 m dia HDPE cages for seed rearing.

Agrilearner App

Stocking

- For producing 5 tonnes of 500-600 g seabass from a 6 m dia. HDPE cage, 30-50 individuals (100 g) per cubic meter can be stocked.

Indian Fisheries	
Global position	3rd in Fisheries 2nd in Aquaculture
Contribution of Fisheries to GDP (%)	1.07
Contribution to Agriculture GDP (%)	5.15
Per capita fish availability (Kg.)	9.0
Annual Export earnings (Rs. In Crore)	33,441.61
Employment in sector (million)	14.0

**Download
Agrilearner App
From Playstore.**



Agriculture Student (Notes, Agri Jobs) Agrilearner

techno India

Education

UNINSTALL

OPEN

**Download Best Agriculture
students App Agrilearner For
Notes And Competitive Exams.**

**Best App for the Preparation of
RBI, NABARD, AFO and other
Competitive Exams**