A

Project Report

On

Inland Fishery And Aqua Culture

Submitted to

SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY,
NANDED - 431606

स्वामी रामानंद तीर्थ मराठवाडा विद्यापीठ नांदेड

In partial fulfillment of the requirement for the award of degree of

MASTER OF SCIENCE
IN
ZOOLOGY
UNDER FACULTY OF SCIENCE

Submitted By

Shivkanya Zelba Bende
M.Sc II Year, ZOOLOGY

Under the guidance of
Dr. K. S. Shillewar
(M.Sc. Ph.D. zoology)

PG Department of ZOOLOGY
N.E.S. Science College, Nanded - 431605 (Re-accredited with A Grade by NAAC)

April - 2023

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April-2023

Seat no - DB6[illegible]059

CERTIFICATE

This to certify that, **Miss. Shivkanya Zelba Bende** Student of M.Sc. Zoology has completed project work entitled

''Inland Fishery And Aqua Culture'

for the partial fulfillment of the requirement for
The Degree of 'Master of Science' in Zoology
Presented to The Department of Zoology,
N.E.S. Science Collage, Nanded.

Swami Ramanand Teerth Marathwada University, Nanded 2022-2023

17/04/2023.

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Head
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17/04/2023.

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Place: Nanded
Date: 17/04/2023.

Principal
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Prof. D.E.S. Nanware 27/4/23
Examiner

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1. INTRODUCTION

Fishing has long been an important source for human nutrition and commercial activity. Although most fishing occurs at sea, in the marine environment, many smaller-scale fisheries rely on inland bodies of water such as lakes and rivers. Most recreational fishing also occurs in inland locations. Inland fishing captures freshwater fish species, such as trout. Some inland fisheries are based upon fish farming, where species are raised in giant tanks or ponds

Inland fisheries must compete with other uses of freshwater in a lake or river. It may be a water supply for the local population, for example. These different interests must be carefully balanced if the quality of the water is not to be degraded. Many fish species have been threatened by overfishing at inland fisheries. Therefore, sustainable fishing practices need to be encouraged inland as much as in the seas and oceans.

Historical Background and Scientific Foundations

Most commercial fishing is carried out in the marine environment, which comprises the seas and oceans. However, some fishing also occurs inland, in the freshwater of lakes and rivers. Freshwater accounts for only around 2% of all water on Earth and most of this is locked up as ice or snow in the polar regions. Therefore, only a limited amount of water is available for inland fisheries compared to the vast resources of the oceans. Inland fisheries are the commercial fishing operations taking place in freshwater. Some of this fishing is capture fishing, where the fish living naturally in a body of water are harvested. The other type of inland fishery is the fish farm, where fish are raised in tanks or ponds, generally for human consumption. Fish farming is a type of aquaculture, which is a broad term referring to the breeding, rearing, and harvesting of plants or animals in water for human use.

Over 90% of all inland fisheries are found in developing countries with the majority being located in China, India, Bangladesh, and Indonesia. Most of the catch of an inland fishery is consumed locally. Many inland fisheries are small operations and it is difficult to capture accurate data for the amount of commercial activity. The Overseas Development Institute quotes a figure of 9 million tons (8.2 million tonnes) caught from 1999, but the actual amount of fish caught might be much higher than this. Records are not always kept and some of the fish will be for subsistence consumption rather than for sale.

Impacts and Issues :-

The locations of inland fisheries often have multiple purposes. For instance, there may be agriculture close by and the lake or river may also be a local water supply. Sometimes the pressure of these conflicting activities may impair the water quality. It is important that the carrying capacity of a particular body of water is known, because overfishing can be as much of a problem in inland fisheries as it is in marine fisheries Many freshwater fish species are now vulnerable, endangered, or even extinct because of overfishing or poor water quality. Therefore sustainable management of

WORDS TO KNOW

AQUACULTURE The farming of fish or shellfish in freshwater or saltwater.

CAPTURE FISHERY The harvesting of fish stocks occurring naturally in a body of water.

FISH FARMING The commercial production of fish in tanks or enclosures, usually for food; also known as aquaculture.

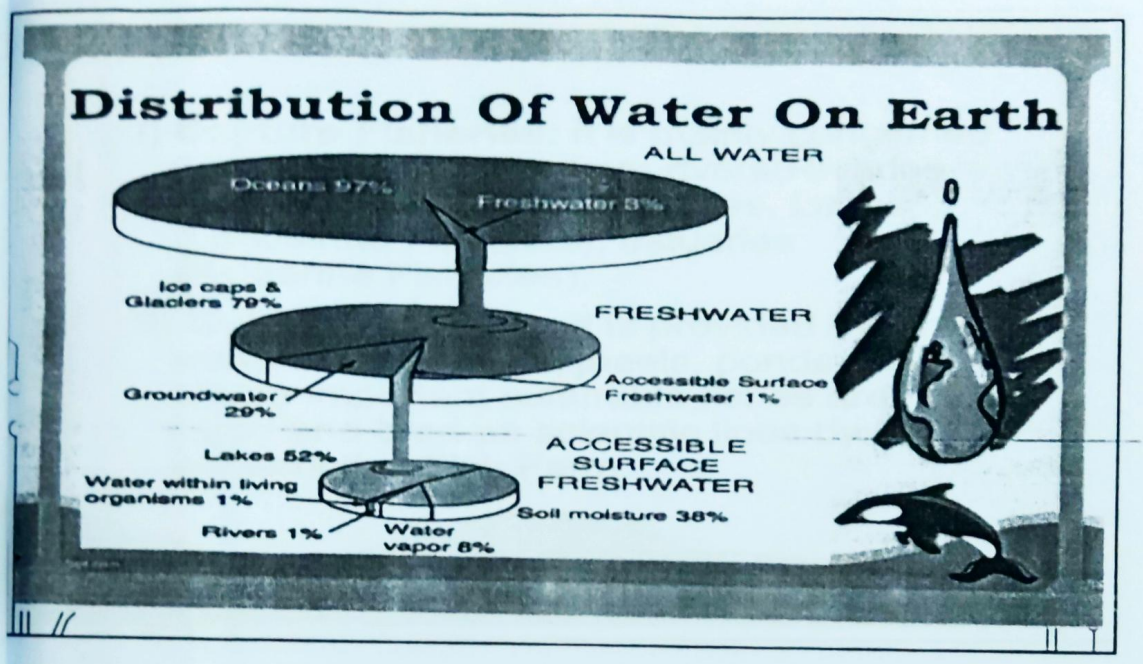
SUSTAINABLE Capable of being sustained or continued for an indefinite period without exhausting necessary resources or otherwise self-destructing: often applied to human activities such as farming, energy generation, or the maintenance of a society as a whole.

INLAND FISHERY AND AQUA CULTURE

SUBMITED TO DEPARTMENT OF ZOOLOGY
SCIENCE COLLEGE NANDED BY
SHIVKNYA Z BENDE

INLAND FISHERIES AND AQUALCULTURE

TOPIC I: Components of Aquaculture: Capture, Culture, Intensive, Extensive, Semi-Intensive, Pen Culture, Cage Culture.



Fisheries in India

Fisheries is divided into three main types:

- Freshwater Fisheries (Inland Fisheries)
- Brakishwater Fisheries
- Marine Fisheries

Inland Fisheries are of two types:

i) **Capture Fisheries**

ii) **Culture Fisheries**

i) **Capture Fisheries:** it is mainly concerned with catching fishes from rivers(Riverine Fisheries), Reservoir Fisheries, Lakes (Lacustrine Fisheries), estuaries (Estuarine Fisheries),

ii) **Culture Fisheries:** it is provided by small water bodies (tanks, jheels, ponds etc.) where important culturable fishes are rared and bred on scientific lines by constructing Fish Farm.

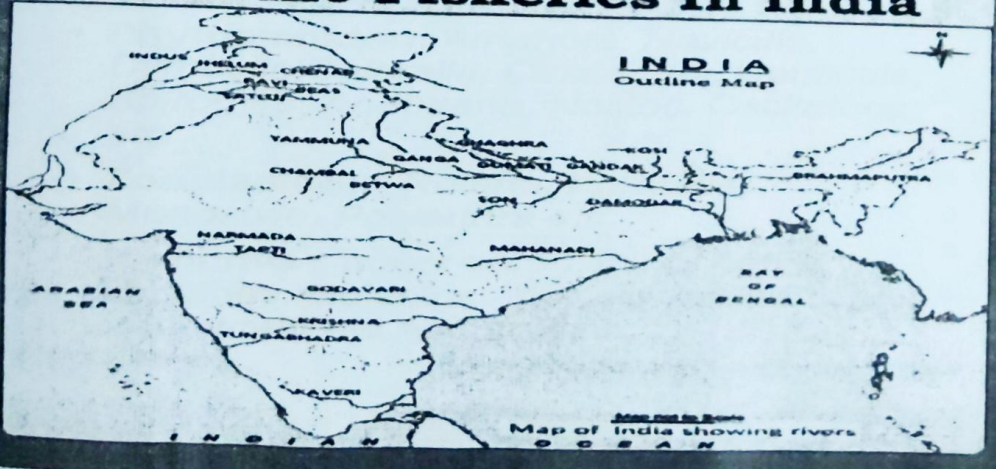
Riverine Fisheries In India

- Rivers in India constitute the backbone of capture Fisheries.
- There are 114 major and minor rivers along with their tributaries.
- Combined length: 45,000 km
- Catchment area: 720,000 sqkm

Principal Riverine fishery resources of India

1) The Ganges River System
2) The Brahmaputra River System
3) The Indus River System
4) The East Coast River System
5) The West Coast River System

Riverine Fisheries In India



Map of India showing rivers

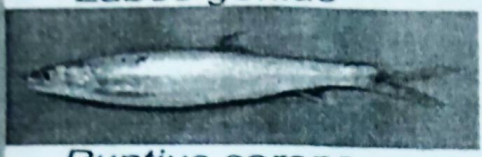
The Ganga River System

- It is the largest river system in India. It is the perennial river originating from the Gangotri near Himalayas, enters the plains at Haridwar passes through the states of UP, Bihar & West Bengal & ultimately joins the Bay of Bengal.
- The principal tributories are rivers Ramganga, Gomati, Ghagra, Gandak, Kosi, Yamuna & Sons.
- Length : 8047 km
- Catchment area: 9.71 lakh sq. Km

- **Phytoplankton:** *Amphora, Navicula, Cymbella, Chlorella, Closterium, Denticula, Spirogyra, Anabaena, Nostoc, Oscilatoria etc.*
- **Zooplankton:** *Rotaria, Keratella, Monostyla, Polyarthra etc.*
- **Fisheries :** major carps, minor carps, catfishes, cluipeids, murrels, featherbacks, freshwater eel and prawns.

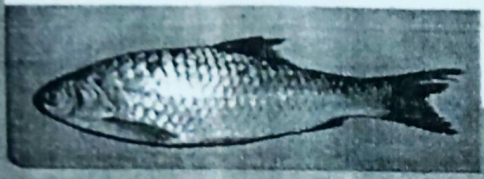
Major Fishes Of Brahmaputra River System

Labeo gonius



Notopterus notopterus

Puntius sarana



Wallago attu

The Indus River System

- The Indus rises about 100 km North of Mansarowar & flows NorthWest through Tibet before entering Kashmir. After flowing about 800 km it turns south through Ladakh range. It enters Pakistan through Kashmir.
- It has five tributories in its left bank, namely: Jhelum, Chenab, Ravi, Beas & Sutlej and ultimately joins the Arabian Sea.
- The fishes found here are of mixed varieties. such as major carps (Catla, Rohu, and C[illegible]hes)

The East Coast River System

- It constitutes of four major rivers :
  Mahanadi, Godavari, Krishna & Kaveri.
- The East Coast rivers ultimately joins the Bay of Bengal.
- Main fishes of Godavari river are: 1465 km (length), 315,980 sq. Km (catchment area)

Catla catla

Channa striatus

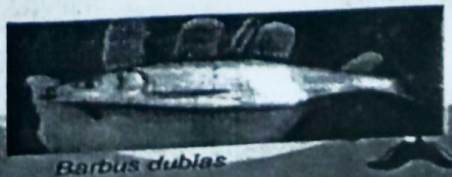
- Main fishes of Krishna river are :1401km (length), 233,229 sq. Km (catchment area)

Mystus seenghala

Hilsa ilisha

- Main fishes of Cauveri river are : 800 km (length), 4,70000 sq. Km (catchment area)

Tor putitora



Barbus dubius

The Peninsular River System

- The Western Coast river system is also known as Peninsular river system. It has two imp. Rivers, namely: Narmada & Tapi.
- The Narmada originates in the Amarkantak Hills, M.P & terminates in the Gulf of Cambay after crossing Gujarat state.The catchment area is about 94,235 sq.km.
- The Tapi river has its origin in Mount Vindhya crosses through M.P, Maharashtra & Gujarat & ultimately joins the Arabian Sea. The catchment area is about 48,000 sq.km.

Major Fishes Of Peninsular River System

- *Main fishes of Narmada river are:*

Notopterus notopterus

Labeo calbasu

- *Main fishes of Tapi river are:*

Mystus seenghala

Tor tor

RIVER SYSTEM	LENGTH (KM)	CATCHMENT AREA (SQ KM)	FISHES
GANGA	8047	96.6 m ha	265 Sp; *Schizothorax* sp, mahaseers, cat fishes(siluridae), *Labeo* sp, Feather backs etc Gangetic Major carps inlower stretches
BRAHMAPUTRA	4027	5,80,000	126 sp; *Tor* sp, chocolate mahseer, *Bagarius* sp:, catfishes, major carps, *Hilsa* etc. Middle – catfishes dominates
INDUS			JHELUM - commercial fishery Brown trout, common carps, loaches, *Labeo dero* etc

EAST COAST	6437		
1. MAHANADI	857	1,41,600	SIMILAR TO GANGA. *Hilsa* at lower reaches
2. GODAVARI	1465		Carps, Large Cat fishes, FWprawn
3. KRISHNA	1280	233229	Dam construction affect fisheries.
4. CAUVERY	850		*Tor* sp: and cat fishes
WESTCOAST	3380		
1. NARMADA	1312	94235	Mahseer, *Labeo* sp, *Wallago attu*, *Channa* sp etc
2. TAPTI	720	46000	Mahseer, *Labeo kalbasu*, *Mystus* sp, *Wallago attu*.

Crafts and gears

- Shallow waters

Nets: trap and cast nets

- Deep waters

Seines, drag nets, gill nets, drift net, dip net, bag nets, fixed trap nets, hooks and lines.

RESERVOIR FISHERIES

- Reservoir is a natural or artificial place where water is collected and stored for use, especially for supplying a community, irrigating land, furnishing power etc.
- Cover more than 1% of the country's land surface. Total area : 31.5 lakh ha
- Yield : 20 kg/ha/yr
- Majorly used for Power generation, irrigation, flood control, recreation.
- Fishery is considered as bye product.
- Major reservoir of India:

Beas dam, Pong dam, Pandoh dam, Gandhi sagar, Hirakund, Rana partap sagar.