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## A REVIEW ON FRESHWATER FISH AND FISHERIES IN INDIA

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### Abstract:

*Maintaining ecological balance and tackling a variety of environmental problems need biodiversity. Globally, the increase in careless human behaviour has an effect on both the natural world and animal variety. The aquatic ecology suffers as a result of rubbish being released into it. Significant research has been conducted in the field of ichthyology by several persons. In terms of importance to the economy, the range of fish and fisheries in India is of paramount interest. The current evaluation concentrates on freshwater species that have been identified and validated by many writers and is pertinent to fisherman, buyers, fish industry producers, and researchers.*

**Keywords:** *Freshwater fish diversity, India, and Fisheries.*

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### Introduction:

The second-largest producer of fish used in aquaculture and third-largest producer of fish overall in the world is India. India produces around 7% of the fish consumed worldwide. More than 10% of the world's fish biodiversity is found in the country, which is also one of the 17 mega-biodiversity-rich nations. The fishing industry and its related industries employ more than 14 million people. Gujarat, West Bengal, and Andhra Pradesh are the three states that produce the most fish in the nation. 12.60 million metric tonnes of fish are anticipated to be produced overall in 2017–18, with over

50% coming from inland fisheries and roughly 70% from cultural fisheries. More than 50 different types of fish and shellfish-based products are exported to 75 different nations. With 13.77 lakh Fish and fish products now account for lakh tonnes of agricultural exports from India, valued at Rs. 45,106.89 crores. This accounts for around 10% of all exports and almost 20% of agricultural exports, and it provides 0.91% of the GDP and 5.23% of the country's agricultural GVA.

### Fisheries:

Is it a commercial activity involving catching fish or other aquatic

creatures in the wild (capture fishing) or breeding them in captivity (aquaculture/culture fishing)? Traditional/ Small Scale Fisheries (SSF) or large-scale/ commercial fishing are two possible types.

#### **Fish:**

(in general) fall within the categories of finfish and shellfish; these cold-blooded aquatic creatures have gills for breathing and fins for swimming.

#### **Finfish:**

Are cold-blooded aquatic organisms having gills, ray-finned fins, and scales covering their body.

#### **Shellfish:**

Are aquatic invertebrates that have a shell or exoskeleton covering the body, gills, and many types of locomotory organs. They possess frigid blood. They are made up of crustaceans and mollusks.

#### **Biodiversity:**

In India, there are several fish species. The National Bureau of Fish Genetic Resources (NBFGR) database contains 1168 native finfish species, 877 of which are found in freshwater environments. Additionally, according to Uttam K Sarkar, JK Jena, Shri Prakash Singh, AK Singh, and SC Rebello (2012), India is home to 291 exotic fish species.

#### **Fish Diversity of India:**

<i>Indigenous fish</i>	<i>Number of Species</i>
Freshwater Ecosystem	877
<i>Exotic Fishes</i>	291
<b>Total</b>	<b>1168</b>

#### **Freshwater Fish:**

Fish that spend the most or all of their life in freshwaters with a salinity of less than 0.5 ppt, such as rivers and lakes, are considered to be these species. Approximately 40% of all fish species known to science live in freshwater settings.

They may be divided into Coldwater Fish (5-20 oC), which includes Mahseer, Trout, etc., and Warmwater Fish (25-35 oC), which includes Carps, Catfish, Snakeheads, Featherbacks, etc. V. Balan (1958).

#### **Freshwater Fisheries:**

Aquaculture accounts for around 65% of India's fish output, with inland waterways producing the remaining 70%. Indian Major Carps make up the majority of the freshwater fish farmed in inland aquaculture, followed by Minor Carps, Exotic Carps, Catfish, and Trout. More than 1300 carp hatcheries in India produce seed and distribute it to fish growers. Malavika Chauhan and Brij Gopal (2006). India's inland water resources fall under the following categories:

**India's Inland Water Resources:**

<b>Warmwater Resources</b>	<b>Extent</b>
Rivers & Canals (km)	1,95,210
Tanks & Ponds (lakh ha)	24.14
Reservoirs (lakh ha)	31.50
Floodplain / Derelict Water Bodies (lakh ha)	8-12
Saline / Alkaline affected areas (lakh ha)	12.00
<b>Coldwater Resources</b>	
Rivers (km)	8,253
Natural Lakes (ha)	21,900
Reservoirs (ha)	29,700

The Inland Fisheries of India may be classified as:

- i. Lacustrine Fisheries (Lakes and Reservoirs)
- ii. Riverine Fisheries (Rivers and Streams)
- iii. Floodplain and Wetland Fisheries
- iv. Coldwater Fisheries
- v. Ornamental Fisheries
- vi. Sport Fisheries
- vii. Culture Fisheries (Aquaculture).







**Carps:**


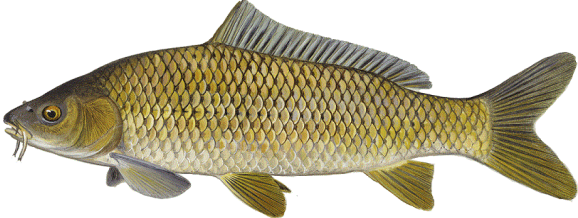

Carp are the main fish used in Indian aquaculture practises, accounting for about 85% of the country's production. Less than 10 carp species are produced there via both culture and capture fisheries, out of the 266 carp species that are found on the Indian subcontinent. Of these, around 34 are economically viable and are predominantly generated by capture fisheries. Since carp have been produced in India as a food source since ancient

times, the country is referred to as the "Carp Country."

The Indo-Gangetic Plains of India and the Indus-Ganges River Systems are home to the Gangetic Carps, often referred to as Indian Major Carps (IMC). 60% of the total carp production is made up of Catla, Rohu, and Mrigal. Species like the common carp, grass carp, and silver carp that were brought from foreign countries are examples of exotic carps.

In addition to the Major Carps, there are smaller fish known as Minor Carps. These include the Reba (*Cirrhinus reba*), Bata (*Labeo bata*), Fringe-lipped carp (*Labeo fimbriatus*), Calbasu (*Labeo calbasu*), White carp (*Cirrhinus cirrhosus*), and Cauvery carp (*Labeo kontius*). J.T. Carlton (1996).


Fish Name	Picture
<b>Indian Major Carps</b>	
Catla <i>Catla catla</i>	
Rohu <i>Labeo rohita</i>	
Mrigal <i>Cirrhinus mrigala</i>	
<b>Minor Carps</b>	
Reba <i>Cirrhinus reba</i>	
Bata <i>Labeo bata</i>	
Fringe-lipped Carp <i>Labeo fimbriatus</i>	
Pengba <i>Osteobrama belangeri</i>	



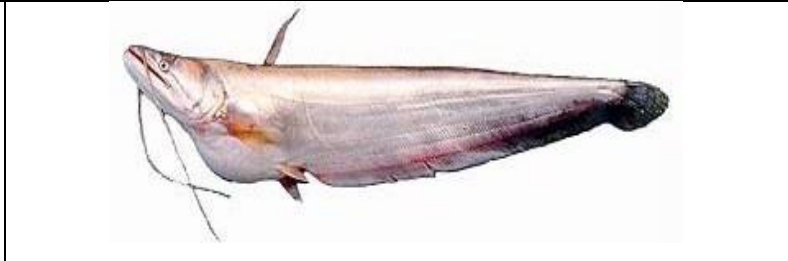
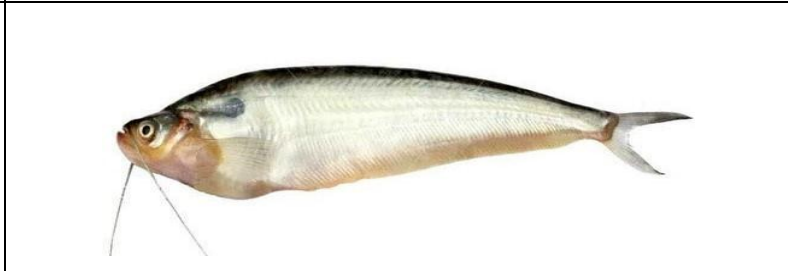
Exotic Carps	
Common Carp <i>Cyprinus carpio</i>	
Amur Common Carp <i>Cyprinus carpio</i>	
Grass Carp <i>Ctenopharyngodon idella</i>	

### Catfish:

Catfish are a diverse group of ray-finned fish that get their name from their projecting barbels, which resemble cat whiskers. (However, not all catfish have obvious barbell). Catfish spent their whole lives underground in caves, while certain catfish species have adapted to flourish in shallow saltwater environments. Catfish are often found in swifter-moving rivers

and streams. Since they are negatively buoyant (i.e., they frequently sink rather than float due to a diminished gas bladder and a hefty, bony head), catfish are mostly bottom feeders. The shallow-water, low-oxygen air-breathing catfishes, like the Singhi and Magur, are referred to as "live fishes," are sold alive, and have a hefty price tag. (1971) Cronin and Mansueti.


Fish Name	Picture
Magur/ Walking Catfish <i>Clarias magur</i>  [formerly known as <i>C. batrachus</i> ]	

<p>Singhi/ Stinging Catfish <i>Heteropneustes fossilis</i></p>	
<p>Giant River-Catfish, <i>Sperata seenghala</i>  [formerly <i>Mystus seenghala</i> / <i>Aorichthys seenghala</i>]</p>	
<p>Freshwater Shark <i>Wallago attu</i></p>	
<p>Pabda Catfish <i>Ompok pabda</i></p>	

**Featherbacks:**

Typically, rivers, beels, reservoirs, and ponds provide deep, clean waters where featherbacks may be found. They are used to situations that move quickly. The Bronze Featherback has reportedly been observed swimming in brackish

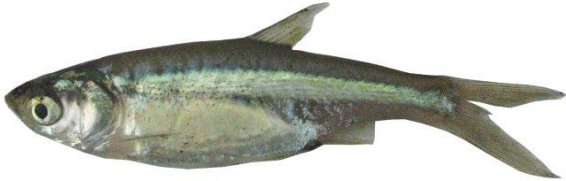



water. They are carnivorous, predatory fish that prey on juvenile aquatic plants' delicate roots as well as tiny fish, mollusks, prawns, and aquatic insects. Despite possessing several intramuscular spines, they are nutrient-rich and cost more money. Day F (1989).

Fish Name	Picture
<p>Chital <i>Chitala chitala</i></p>	

**Small Indigenous Fish Species (SIFS):**

They are defined as fish that can grow to a maximum size of 25 to 30 cm when they are in the mature or adult stage of their life cycle. They inhabit marshes, paddy fields, ponds, tanks, lakes, beels, streams, lowland environments, and floodplains. Only roughly 450 of India's 877 native freshwater fish species are classified as Small Indigenous Fish

Species (SIFS). The largest variety of SIFS in freshwaters is found in the North East Region, followed by the Western Ghats and Central India. Another 62 SIFS are classed as food fish, while 42 species of fish are designated as decorative fish. It is possible to grow the SIFS Mola, Climbing Perch, Barbs, Bata, and other species. Kumaran and Jones S. (1980).

Small Indigenous Freshwater Fish Species (SIFS)	
Fish Name	Picture
Mola Carplet <i>Amblypharyngodon mola</i>	
Climbing Perch <i>Anabas testudineus</i>	
Ticto Barb <i>Puntius ticto</i>	
Pool Barb <i>Puntius sophore</i>	 Photo credit: Balaram Mahalder www.bdfish.org

**Snakeheads:**




Areas of Africa and Asia are home to the freshwater Perciformes fish family

Channidae, which contains snakeheads. They inhabit waters that are marshy and have gills that can breathe air. By writhing

with their bodies and fins, they are said to travel up to 400 metres through wetlands to other bodies of water. If they are moist, they may remain without water for up to four days. Their throat develops into two air chambers called suprabronchial cavities, which are lined with vascular epithelium. These chambers serve the same purposes as lungs by absorbing air.

Snakeheads first consume plankton, aquatic insects, and mollusks; as

they grow larger, though, they begin to turn predatory and cannibalistic. The snakehead's meat is delectable, packed with nutrients, and has potent therapeutic properties. Snakehead also contains all the essential amino acids for wound healing, including glycine, which is essential for the synthesis of collagen in human skin. A 2008 study by Jha, B. C., D. Nath, N. P. Srivastava, and B. B. Satpathy.

Snakeheads	
Fish Name	Picture
Striped Murrel / Snakehead <i>Channa striata</i>	
Spotted Murrel / Snakehead <i>Channa punctata</i>	
Flower Murrel / Bullseye Snakehead <i>Channa marulius</i>	

### Tilapias:




A kind of "Cichlid" fish native to Africa is the tilapia. Following the Second World War, tilapia farming in ponds was initially conducted in Central African

countries. It swiftly spread to most tropical and subtropical countries, earning them the nickname "international fish." Despite the fact that most of the world's tilapia natural resources are located in Africa, Asia



produces more than 80% of the 5.0 million metric tonnes of tilapia used for aquaculture globally. Tilapias are recognised as the most important aquaculture species of the twenty-first






century and are grown commercially in 100 countries throughout the world, ranging from extensively to highly intensively. Rajendran N. and Kathiresan K. (2005).





Fish Name	Picture
Nile Tilapia <i>Oreochromis niloticus</i>	
GIFT Strain <i>Oreochromis niloticus</i>	
Red Tilapia <i>Oreochromis niloticus</i>	

### Coldwater Fishes:

There are several coldwater species of fish in India's freshwater ecosystem. Fishing in water with a temperature of between 5 and 20 degrees centigrade falls under the purview of coldwater fisheries. As a defence against the cold, cold-water fish have substantially smaller gill openings and gills. Important coldwater fishes of India include mahseers like *Tor putitora*, *Tor tor*, *T. khudree*, and *T. mosal*, as well as snow trout like *Schizothorax richardsonii* and *Schizothoraichthys*  
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*esocinus*, mountain trout like *Bariliusvagra*, *B. bendelisis*, and other fish like *Glyptothorax sp.*, *Garra sp.* V. S. Kennedy (1990).

Mahseers	
Fish Name	Picture
Golden Mahseer <i>Tor putitora</i>	
Tor Mahseer <i>Tor tor</i>	
Deccan Mahseer <i>Tor khudree</i>	
Chocolate Mahseer <i>Neolissocheilus hexagonolepis</i>	
Trout	
Common Snow Trout <i>Schizothorax richardsonii</i>	

Rainbow Trout <i>Oncorhynchus mykiss</i>	
Brown Trout <i>Salmo trutta</i>	
Brook Trout <i>Salvelinus fontinalis</i>	
<b>Others</b>	
Mountain Trout <i>Barilius vagra</i>	

### Conclusion:

India has a great diversity of fish, demonstrating that a significant amount of this is threatened by human activities. The development and implementation of conservation strategies, the improvement of fishermen's fishing expertise, the provision of scientific training, the provision of facilities to fish farms, the prevention of juvenile fishing, and the maximisation of yield all depend on the

fish fauna and distribution. In order to limit anthropogenic activities, it is also important for Fishery and the Department of the Environment to establish legislation and other conservation measures.

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