



*"In this land of the Ganga, there was education of culture.
But, more importantly, there was a culture of education."*

-PM Narendra Modi



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**GNAMAMI
GANGETE**



सत्यमेव जयते

The Ganges Children Handbook

Module 3
Ganga's Ecosystem



Indian Institute of Public Administration
New Delhi

**GNAMAMI
GANGETE**



NAME OF PROJECT

BLENDED CAPACITY BUILDING PROGRAM
FOR STAKEHOLDERS OF RIVER GANGA

PROGRAMME

NAMAMI GANGE PROGRAMME

PREPARED FOR

NATIONAL MISSION FOR CLEAN GANGA

PREPARED BY

INDIAN INSTITUTE OF PUBLIC ADMINISTRATION

SPECIFIC FOCUS

STUDY MODULE FOR SCHOOL STUDENTS

PROJECT TEAM

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The Ganges

Children Handbook

Module 3

Ganga's Ecosystem

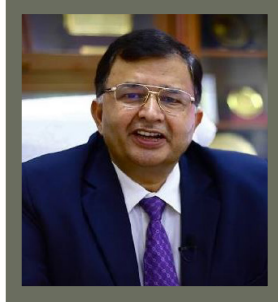


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MESSAGE

THE DIRECTOR GENERAL



My young Companions,

"Children are the hands by which we take hold of heaven"

The above quotation by Henry Ward Beecher has inspired me to join hands with you in rejuvenation and conservation of our holy river Ganga. I consider your role in the society and believe that your participation in this herculean task can improve the present state of our River.

To make the descent of Ganga worthwhile, you are being made a part part of the project - Blended Capacity Building Programme for Stakeholders of River Ganga under Namami Gange Programme. Ganga lies at the core of our culture and it is our firm belief that your awareness of the complex challenges faced by our national river can bring about behavioural change in the society at large.

Through this booklet, you will be taken to a journey along the Ganges and its basin. We want to create an imprint on you and mould each one of you into responsible adults. This learning process has been tailored for your effective engagement with inclusion of maps, quizzes and puzzles.

We consider the potential of a child in contributing towards a cleaner, breathable future. It is our hope and expectation to meet with your feelings, thoughts and awareness to foster a sense of belonging for River Ganga. We have faith in your tremendous curiosity and capacity & hope that together we can change mindsets and take it to practical application.

S.N. TRIPATHI
Director General, IIPA

PREFACE

Universally and religiously, water is considered a purifying natural symbol. Indian rivers, besides being the lifeline for many are considered as manifestations of the divine. They connect state to state, past to present. The Ganges is our sacred river with a culturally significant history. It is not just a river but a deity, a cleanser of sins; It is our mother.

Ganga is a part of India's rich past. It is a symbol of purity and sanctity. It occupies a central space in the collective consciousness of the country, which is why Gangajal is considered the holy water. River Ganga, not only fosters exceptionally rich biodiversity, but it also contributes heavily to the livelihood of India

It is unfortunate that despite the admiration and reverence invoked by the river, it has become a dumping junkyard at innumerable points. Human greed and misconduct have degraded the river quality. It is indeed a matter of concern that the river has altered its flow over the years; with that, the National Mission for Clean Ganga (NMCG) has stepped in to keep the river clean, pure and healthy for the benefit of existing and future generations. It is a matter of pride for IIPA to be entrusted by the project "Blended Capacity Building for Stakeholders of River Ganga" under the Namami Gange programme.

With the aim of conserving and rejuvenating River Ganga, The 'Ganges -Children Handbook' has been prepared to make children interact with our national river. The book encompasses a holistic view of the river Ganga by posing the challenges and opportunities in and around Ganga basin.



V. K. S H A R M A
Senior Professor, IIPA



S H Y A M L I S I N G H
Assistant Professor, IIPA

"Water is the driver of Nature. When you put your hand in a flowing stream, you touch the last that has gone before and the first of what is still to come."

- Leonardo da Vinci



How was your journey? You must be tired. Take a break! Sit back and take benefit of ecoservices provided by ecosystem around River Ganga



The **Ganges flows** in three stretches - **upper, middle and lower stretch**. The upper stretch is characterized by bedrock and pebbles, the middle is highly wide consisting of meandered channels. In the lower stretch, it meets many tributaries.

Ganga originates from the world's youngest mountain ecosystem - the Himalayan region, making it one of the major never-ending Himalayan river systems. The beauty of this region lies in its complexity & its diverse ecosystem.

Distribution of Ganga's ecosystem



Flora



Wetlands



Marine Areas



Fauna



Forests



Fresh water rivers channels



FORESTS

Forest covers 14.6% of Ganga's basin. Apart from preserving dependable resources for communities, nations and future generations, they also provide lifeline to the rivers. To enhance the productivity and diversity of the forests in an area, it becomes important to recognize the intricacies of forest ecosystems.

How are they important for the river?

- Reduces soil erosion
- Recharges groundwater
- Fights climate change by reducing CO² emissions from the atmosphere
- Dilutes pollution and sewage by increasing the water volume in the river

MAJOR TYPES OF FORESTS

Sal
Teak
Sandalwood
Arjun
Jarul
Ebony
Mulberry
Kusum
Siris
Palash
Mahua
Simul
Dhup



TROPICAL MOIST

Teak
Sal
Bijasal
Laurel
Palas
Khair
Kendu

SUB TROPICAL CONFIREOUS

Chir pine



HIMALAYAN DRY DECIDUOUS

Chilgoza
Deodar
Oak
Maple
Ash
Celtis
Parrotia
Olive
Oak

HIMALAYAN MOIST

Deodar
Spruce
Maple
Walnut
Poplar
Cedar
Chestnut
Birch
Oak



WETLANDS

Out of 170 wetlands of national importance, Ganga river basin supports around 50 wetlands.

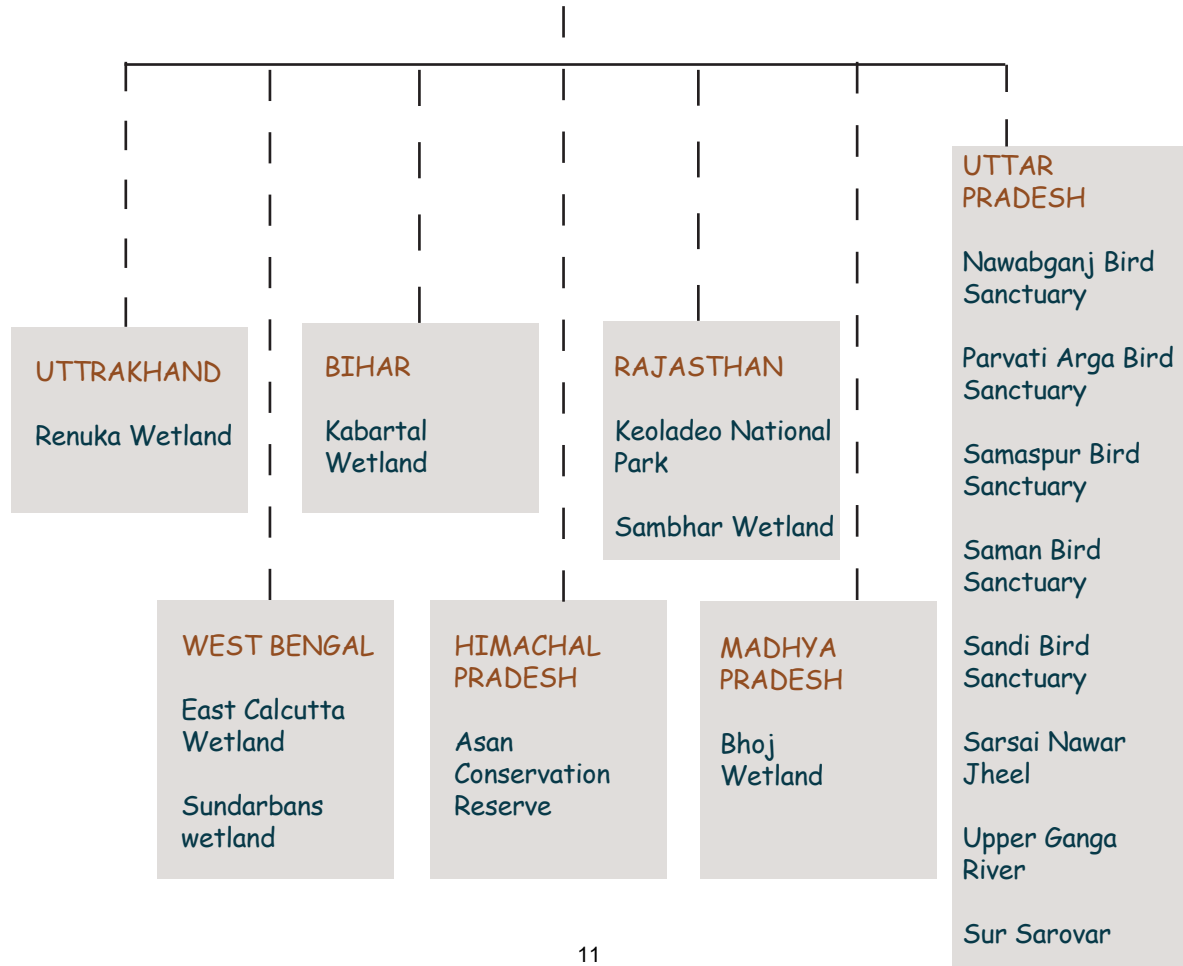
Why are they important?

- Forces flood water to spread out by minimizing its damaging effects
- Stores and slowly releases flood waters to river channels
- Artificial wetlands cultivated for final cleansing of sewage effluent
- Provides food, habitat, shelter for enormous variety of plants and animals
- Supports both terrestrial and aquatic species

Wetlands are parts of the landscape defined by the presence of water over soil which influences the biological, physical and chemical characteristics of a particular site.

16 wetlands have received international importance under Ramsar Convention for their cultural, economic and recreational value.

RAMSAR SITES





FAUNA

The Ganga river system is home to some of the most threatened and endangered species of the world. They are reliable indicators of the health of Ganga river ecosystem.



Gangetic River Dolphin : National aquatic animal, the only mammalian predator of river Ganga



Otters: Adapted to semi-aquatic life



Birds: Migratory bird, resident breeding birds, Ganga river basin supports 177 species of migratory and resident breeding birds, 8 species of resident breeding birds in the Ganga river.



Crocodilians: In India, 3 species of crocodilians are distributed in the Ganga river and its tributaries.



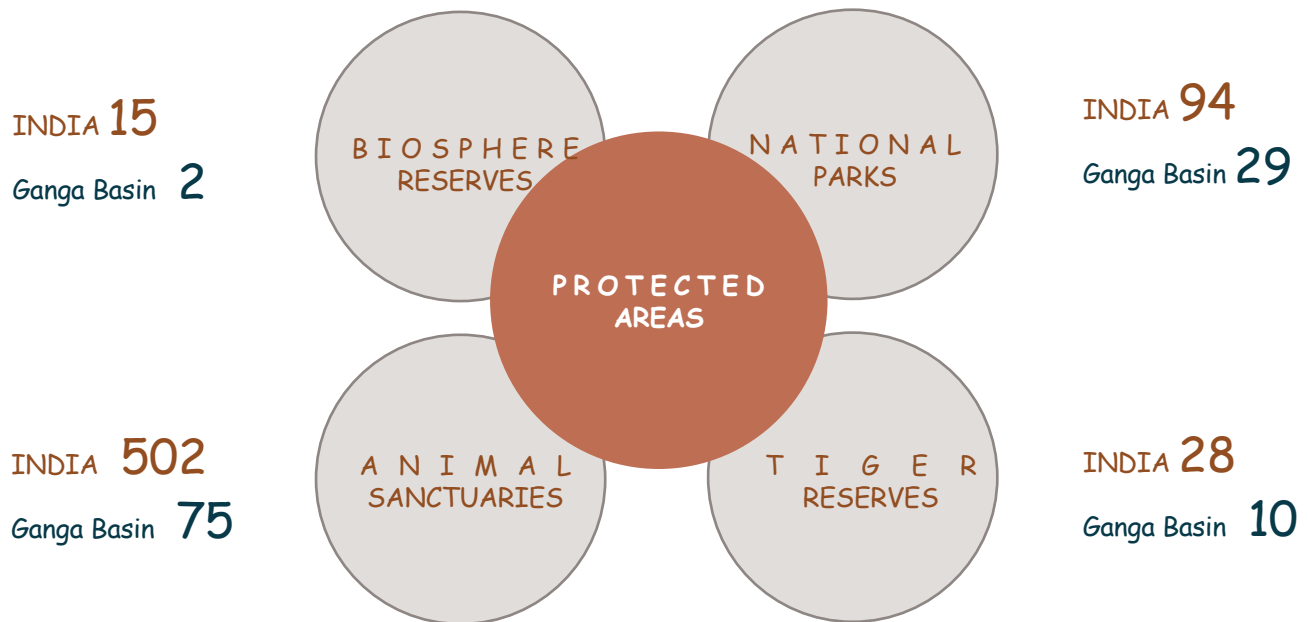
Turtles: Ganga river is home to at least 13 of these freshwater turtle species, Freshwater turtles in the Ganga are divided into: Hard-shell turtles and Soft-shell turtles.



Fish: 143 different freshwater fish species have been reported in Ganga river system including the critically endangered Ganges Shark and Golden Mahseer.

ECOLOGICALLY PROTECTED AREAS

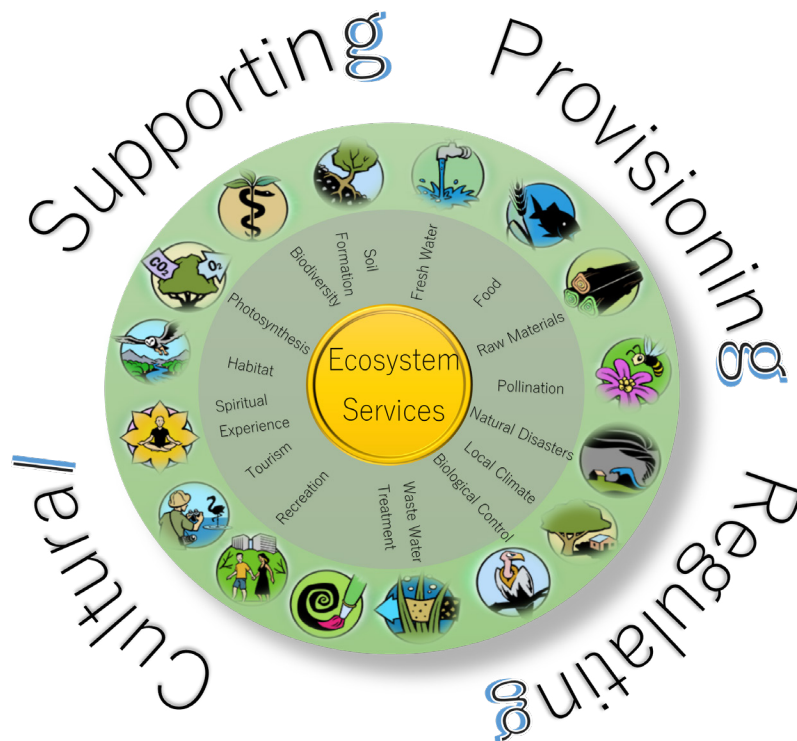
Protected areas are natural and sub-natural habitats for biodiversity conservation. They facilitate in conserving gene pools, protecting wildlife flora and fauna and in maintaining ecosystems functioning. They preserve biodiversity as well as benefit the local economy of a region.



The ecosystem of the region provides us with goods and services on which we rely for our health and well-being and helps in growing the economy, also

referred to as **Ecosystem services**

They are grouped into four broad categories:





WHAT LEADS TO DECREASE IN BIODIVERSITY?

Ecosystem services can be availed only if the ecological processes continue to function smoothly. For Ganga to flow seamlessly, it becomes essential to identify the threats to its ecosystem which are-

1. Animal Poaching
2. Climate Change
3. Industrialization
4. Construction of dams and barrages
5. Pollution
6. Deforestation
7. Over-exploitation of resources

READY? SET YOUR TIMER AND GO...

Can you identify the tree species from its leaf?



Arjun Tree



Maple Tree



Mulberry Leaf



Chestnut Tree



Cedar tree

WORD HUNT

Ganga Fauna

R	H	S	P	O	T	T	E	D	B	A	R	B	E
E	S	N	O	W	L	E	O	P	A	R	D	H	R
B	A	T	A	O	R	B	P	O	R	N	A	C	I
L	A	G	A	N	G	E	S	S	H	A	R	K	V
D	A	E	M	E	R	G	H	A	R	I	A	L	E
G	O	L	D	E	N	M	A	H	S	E	E	R	R
C	D	C	M	L	C	L	A	M	M	R	A	G	L
D	R	E	G	I	T	L	A	G	N	E	B	P	A
K	A	B	G	S	G	D	O	L	P	H	I	N	P
F	I	S	H	I	N	G	C	A	T	M	B	N	W
T	O	O	F	N	I	F	D	E	K	S	A	M	I
G	O	R	F	S	E	D	A	C	S	A	C	A	N
N	R	E	T	R	E	V	I	R	E	G	N	O	G
D	A	O	T	D	E	L	B	R	A	M	G	R	R

MASKED FINFOOT

MARbled TOAD

RIVER LAPWING

SNOW LEOPARD

GHARIAL

GOLDEN MAHSEER

RIVER TERN

BENGAL TIGER

SPOTTER BARB

GANGES SHARK

FISHING CAT

CASCADES FROG

DOLPHIN













