

Blended Capacity Building Programme for Stakeholders of River Ganga

01

under Namami Gange Programme

INTRODUCTION TO GANGA



Indian Institute of Public Administration

New Delhi



**GNAMAMI
GANGE**

OVERVIEW

NAME OF PROJECT

BLENDED CAPACITY BUILDING PROGRAM FOR STAKEHOLDERS
OF RIVER GANGA

PROGRAMME

NAMAMI GANGA PROGRAMME

PREPARED FOR

NATIONAL MISSION FOR CLEAN GANGA

PREPARED BY

INDIAN INSTITUTE FOR PUBLIC ADMINISTRATION

SPECIFIC FOCUS

STUDY MODULE SERIES FOR COLLEGE STUDENTS

PROJECT TEAM

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*Cover page image: The Ganga Delta, a
stunning view to the crew of the Space
Shuttle Columbia on mission STS-87.
Photograph by NASA*

*Left image: Tehri Dam, Uttarakhand.
Photograph by Altaf Qadri*

MESSAGE DIRECTOR GENERAL



My young Companions,

“Students 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

Through this booklet, you will be taken to a journey along the Ganges and its basin. I 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.

challenges faced by our national river can bring about behavioural change in the society at large.

I consider the potential of a student in contributing towards a cleaner, breathable future. It is my hope and expectation to meet with your feelings, thoughts and awareness to foster a sense of belonging for River Ganga. I 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

Dear Students,

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, This series has been prepared to make students 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. SHARMA
Senior professor, IIPA



SHYAMLI SINGH
Assistant professor, IIPA



A JOURNEY DOWN THE GANGES

Ganga, also known as Ganges officially, is a large river system flowing east through the Gangetic plains of North India in the Indian subcontinent, passing 2,525 km in the process of discharging into the Bay of Bengal through its vast delta in the Sunderbans and Bangladesh. During this path, several significant tributaries add drainage streams to make Ganga the world's third-largest river by discharge volume. The first largest is the Amazon river and second largest is Congo rivers. The banks of the Ganges are the largest in India and water northern Uttarakhand, Uttar Pradesh, Haryana, Rajasthan, Himachal Pradesh, Delhi, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand and West Bengal. Several important cities in India located along the banks include Kanpur, Patna, Kannauj, Kashi, Allahabad, Varanasi and Kolkata. These cities caused a lot of domestic and industrial pollution, worsening the "holy" Ganges. Environmental destruction sparked serious protests, and in 1986, the government implemented the Ganges Action Plan to restore the river. The Ganges River has long been considered sacred to Indians and is worshiped as the Ganga Goddess. The Hindus make a pilgrimage, especially the cities of Haridwar, Varanasi and Prayagraj (the confluence of Triveni). On the shores of Ganges, there are several religious rituals. The Ganga also provides water for industries, irrigation and drinking water to eleven states in India.

"I am convinced that everything has come down to us from the banks of the Ganga - astronomy, astrology, spiritualism, etc. It is very important to note some 2500 years ago at the Pythagoras went from Samos to the Ganga to learn Geometry"

Francis M. Voltaire

River system:
the small streams flowing from different directions come together to form the main river, which ultimately drains into a large water body such as a lake or a sea or an ocean

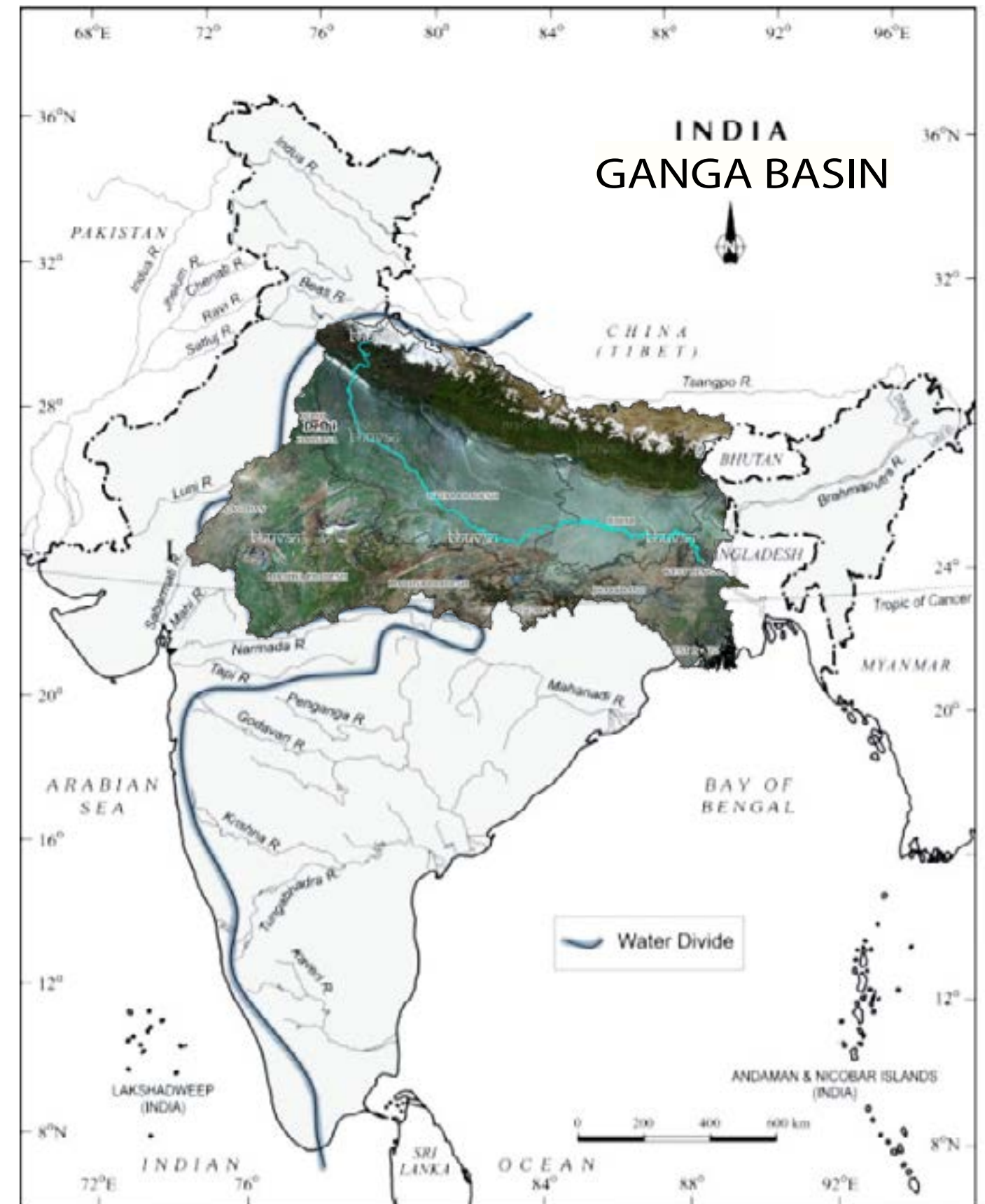
Drainage:
the river system of an area

Tributaries:
a river or stream flowing into a larger river or lake

Delta:
form as rivers empty their water and sediment into another body of water, such as an ocean, lake, or another river

Water Divide:
an elevated area such as mountain or upland separating drain basins

Headstream:
a stream that is source of river



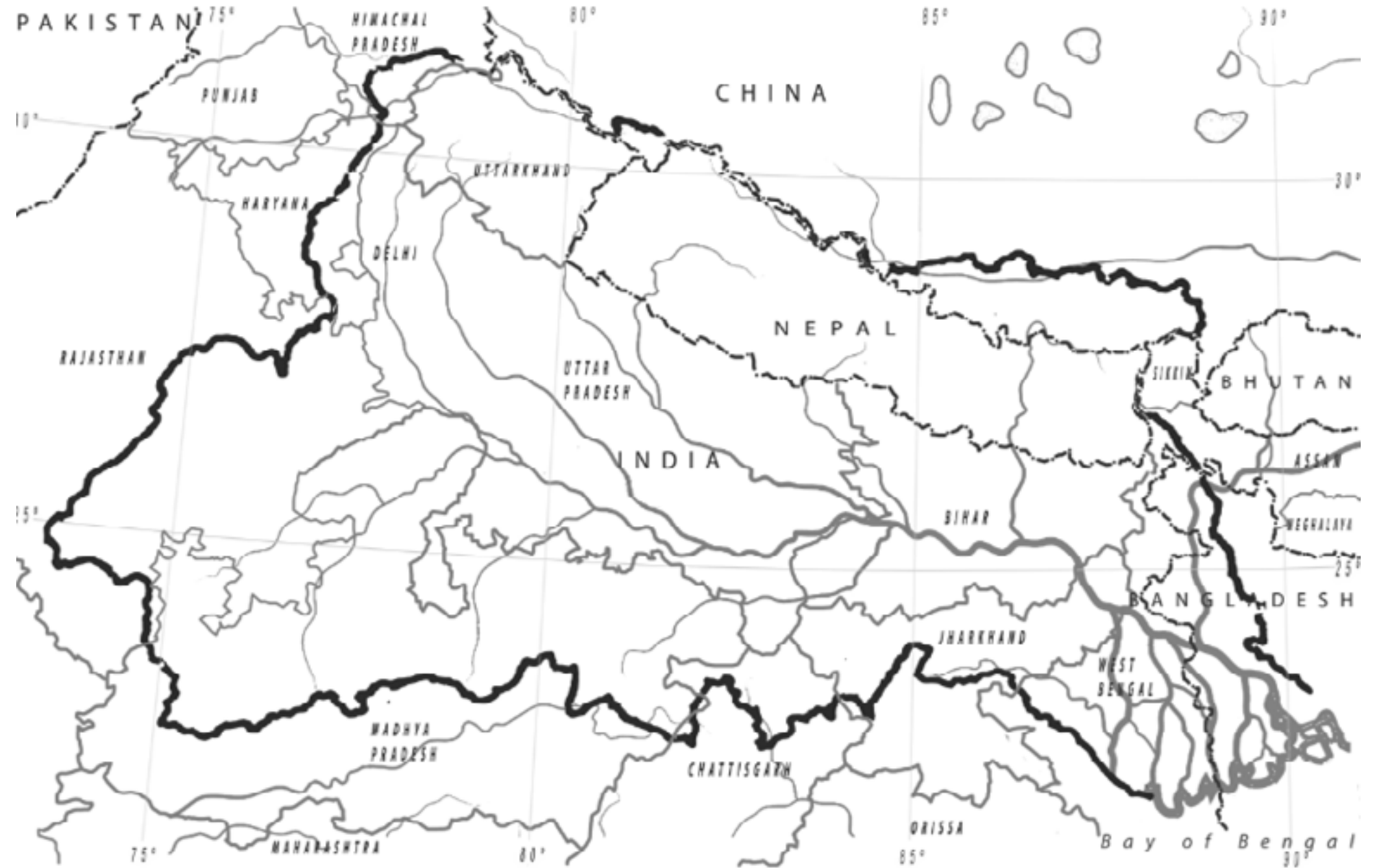
ENROUTE GANGA

The Ganges River flows southeast through India's Uttar Pradesh, Bihar and West Bengal states. Further crossing the Indian sub-continent and flowing from central Bangladesh merging the mighty Brahmaputra and Meghna River. The combined water known as Padma River flows into the Bay of Bengal, forming a common delta 354 sq.km wide. The plains of the river Ganges are one of the most fertile and heavily populated areas in the world. The Himalayan glaciers of Uttarakhand are source of water and fluctuates the flow of the Bhagirathi River. Gaumukh has been described as an uninhabited place at an altitude of about 4000 meters and is the origin point of the river. Twenty-three kilometers from Gaumukh is the Gangotri River, the first town by road. Every year, thousands of visitors from all over the world visit Gangotri. The River that flows into the Alaknanda River in Devprayaga is also in Uttarakhand, Himalaya and forms the Ganges. Further, the Ganges River passes through the Himalayan Valley into the plains of Northern India. The first town in the plains is Haridwar, further flowing in the southeast through India's Uttar Pradesh, Bihar, and West Bengal states. Holy Prayagraj, also known as Triveni Sangam where Yamuna and Saraswati joins with Ganga. Ganga passes through some of India's most populous cities, including Kanpur, Allahabad, Varanasi, Patna and Kolkata. Within 100 miles east of Bhagirathi, Yamuna flows parallel to the Ganges River and a little further south before it merges with the Ganges.

The river has several headstreams starting from the east, where the Tamsa River (also called Tons), meets Ganges which flows north from the Kaimur Range. After the Tamsa the Gomti River joins, flowing south. Then the Ghaghara River (Karnali River), also flowing south from the Himalayas of Nepal, joins that is the largest tributary of the Ganges. After the Ghaghara confluence the Ganges is joined from the south by the Son River. The Gandaki River, then the Kosi River, join from the north flowing from Nepal. The Kosi River is the third largest tributary of the Ganges, after the Ghaghara (Karnali) and Yamuna.

Right image:

The basemap of Ganga Basin depicting the study area



TO KNOW MORE



SCAN CODES

"The Ganga to me is the symbol of India's memorable past which has been flowing into the present and continues to flow towards the ocean of the future."

Jawaharlal Nehru, First Prime Minister of India

GANGA BASIN AT GLANCE

Countries	India, Bangladesh
Key states	Uttarakhand, Uttar Pradesh, Bihar, Jharkhand, West Bengal,
Linked states	Haryana, Rajasthan, Himachal Pradesh, Chhattisgarh, Delhi, Madhya Pradesh
Tributaries	Left Bank: Ramganga, Sarda, Ghaghara, Rapti, Saryu, Gomti, Ghandak, Kosi, Meghna, Bharamputra Right Bank: Yamuna, Chambal, Betwa, Ken, Banna, Son, Rihand, Mayuryakshi, Barakar, Kasai, Haldi, Damodar
Length	2,525 km (1,569 mi)
Area of Basin	1,080,000 km ² (416,990 sq. mi)

HISTORICAL CHANGES IN COURSE OF THE GANGES

In the Ganges Delta, numerous enormous waterways meet up, both combining and bifurcating in a muddled organization of channels. The two biggest waterways, the Ganges and the Brahmaputra, both split into distributaries channels. The present river channel design was not generally the situation. The Ganges Delta have changed course in the past and now again adjusting the organization of water path in critical manners.

Before the 12th century, the Bhagirathi-Hooghly distributary were the primary channel of the Ganges and the Padma was a minor spill-channel. The flow of Ganga until the mouth of sea was monitored by Adi Ganga instead or present day Hooghly River. Advancements between 12th and 16th centuries Bhagirathi-Hooghly and Padma channels also developed in as fundamental channels for the Ganges. By the end of 18th Century, Padma had become the main distributary of the Ganges. These consequences lead to the change of course of Ganga as it formed a delta with Meghna River and Brahmaputra River before flowing into Bay of Bengal.

Post this near the end of 18th century, the course of lower Brahmaputra altered from Ganga. The year 1787, Ganga basin experienced a great flood on the Teesta River and the river meandered east to join Brahmaputra, further shifting Brahmaputra course towards southern side. This channel of Brahmaputra was named Jamuna River. The site of old Bramaputra and Megha confluence in the section of Langalbandh and is sacred place for Hindu population.

TO KNOW MORE



SCAN CODES

Species:
a group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding

Endangered Species:
a species of animal or plant that is seriously at risk of extinction



FEATURES OF THE GANGA

WETLANDS

Ramsar Convention define the importance of wetlands towards their countless benefits and ecosystem services. The Ganges basin has twenty-one Ramsar Wetlands which are of international importance. The Ganges basin has many wetlands with eighteen major wetlands directly associated along the course of River Ganga. The state wise listing is as follows:

- Uttar Pradesh: Narora Dam, LakhBahosi Wildlife Sanctuary, Samaspur Bird Sancturary and Surha Tall Wildlife Sanctuary.
- Bihar: Kurshela river course and Diyara floodplain, Mora Mahananda Taal, Gogabil Pakshi Vihar, BhagarBeel and BaldiaChaur, Vikramshila Gangetic Dolphin Sancturary, Morwe Reservoir, Khabar Taal, Salah Chaur.
- West Bengal: Farakka Barrage, Naya Bandh wetland complex
- Uttarakhand: Tehri Dam, Jhilmil Jheel and Banganga
- Jharkhand: Udhuwa Lake Bird Sanctuary



LIFE FORMS OF GANGA RIVER

Ganga Basin has supports 2000 aquatic species ⁽⁵⁾. The Ganga Basin has witnessed a wide variety of rare and threatened species. These include the Gangetic dolphin (*Platanista gangetica*), tharee ⁽⁹⁾ species of otters that is the Smooth-coated otter (*Lutrogale perspicillata*), Eurasian otter (*Lutralutra*) and the Small clawed otter (*Aonyx cinereus*), the Critically Endangered Gharial (*Gavialis gangeticus*), Muger or Indian marsh crocodile (*Crocodylus palustris*), Estuarine crocodile (*Crocodylus porosus*) and at least twelve species ⁽⁹⁾ of freshwater turtles, including the Critically Endangered Batagur kachuga. Ganges has one hundred forty three different freshwater fish species, including the Critically Endangered Ganges shark (*Glyphis gangeticus*), Gangetic stingray (*Himantura fluviatilis*), Golden mahseer (*Tor putitora*) and Hilsa (*Tenualosa ilisha*). The gangetic plane supports one hundred of Birds in various landuse types. The gangetic Dolphin is India's national aquatic animal.





TOWARDS A CLEANER GANGA

There has been serious threats to Ganges basin due to various factors mainly being water pollution, climate change, urbanisation, exponential population growth and unregulated tubewells. Billions of people depend on River Ganga and deterioration of the river will cause severe water scarcity in the northern plains of India. Indirect health impacts due to river pollution will also be inevitable. In lieu of the situation foreseen the central government visioned and developed the Integrated Ganga Conservation Mission⁽⁸⁾.

The program approaches Ganga Rejuvenation by consolidating the existing ongoing efforts. Namami Gange focuses on cleaning of river Ganga in short term as well as also has a comprehensive vision with seven thrust areas. These being namely maintenance of flow, river front development, capacity building, research and monitoring, biodiversity conservation, communication and public outreach.

Above Image:

The image showing Ganga River from ghats of Bithoor in north of Kanpur City.

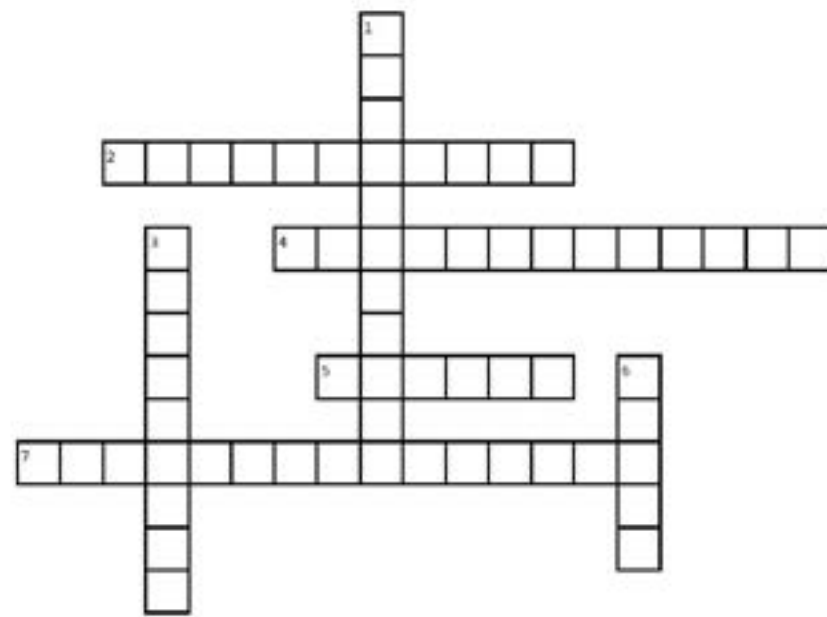
THINK IT OUT

Down:

1. STATE OF ORIGIN OF THE GANGA
3. THE CONFLUENCE OF TRI,
6. THIRD LARGEST RIVER BY DISCHARGE VOLUME

Across:

2. FLUVIAL SEGMENTS GAUMUKH TO
4. 1,080,000 km sq.
5. LARGEST TRIBUTARY OF THE GANGA
7. INDIA'S NATIONAL AQUATIC ANIMAL



FUN FACTS

Ganga is also the home for fresh water dolphins and Ganges sharks, both of which are endangered species with Ganges shark being critically endangered.

D.S. Bhargava also found during his 3-year study that the river is capable of reducing its level biochemical oxygen demand way faster than any other river in this world.

Ganga river is the largest Submarine Fan in entire world, spanning over a length of 3000 km and width of 1000 km.

Ganges river system is the only one on earth to have both freshwater dolphins and riverine sharks.

It is 34th longest river in the world by length.

The delta of River Ganga forms the world's largest, known as Sunderbans, and was declared a World Heritage Site by UNESCO in 1997.

The Prayagraj Kumbh Mela 2019 has secured place in the Guinness Book of World Records for the largest crowd management, largest sanitation drive and largest painting exercise of public sites, the government said in New Delhi on Sunday.

The Ganges basin extends over more than 1 million square kilometers (386,000 square miles).

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**“If Ganga lives, India lives
If Ganga dies, India dies”**

Dr. Vandana Shrivastava