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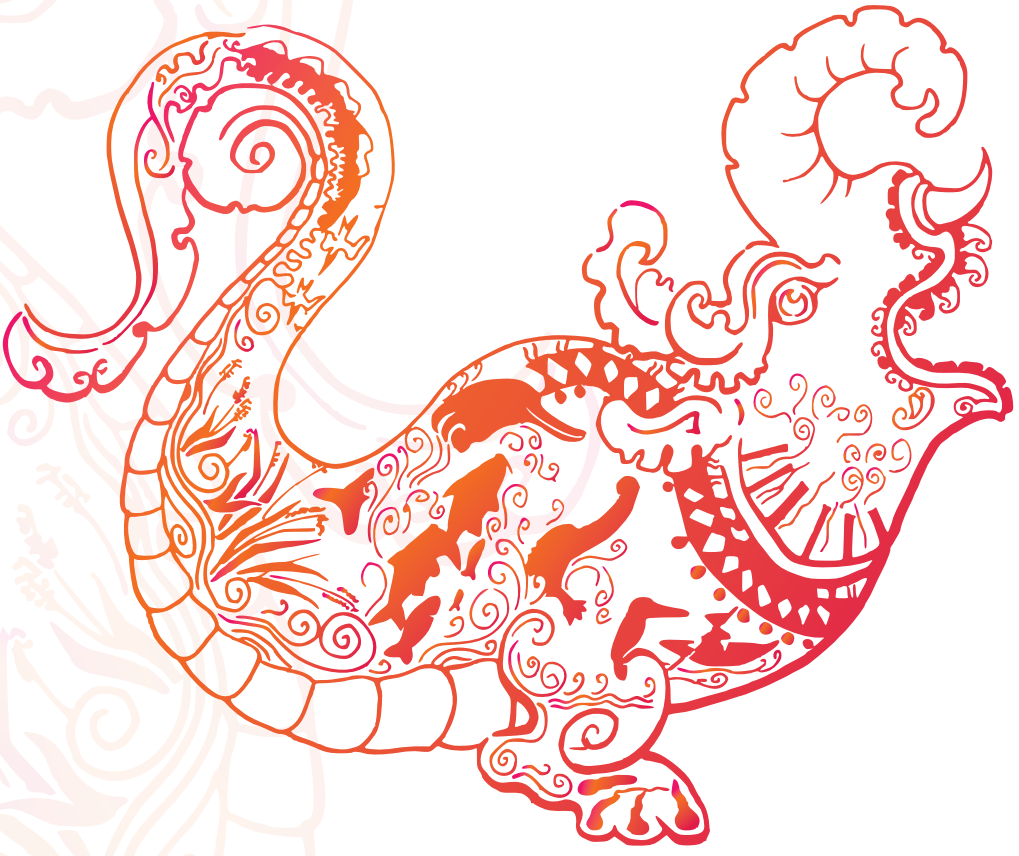

SAANSKRITIK LEHEREN

Culture along

GANGA

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Photo: Vinay K. Bhargava

Planning and Management for Aquatic Species Conservation and Maintenance of Ecosystem Services in the Ganga River Basin for a Clean Ganga

Saanskritik Leheren: Culture along Ganga

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Uttarakhand, India



Tehri Lake, nestled in the Garhwal Himalayas of Uttarakhand, is a large artificial lake formed by the construction of the Tehri Dam on the Bhagirathi River.

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GANGA AND CULTURE

Culture, as eloquently defined by French novelist, art historian and statesman, André Malraux (1901-76), is *"the sum of all the forms of art, of love, and of thought, which, in the course of centuries, have enabled man to be less enslaved."* It is the differential factor that distinguishes human groups and helps understand the nature of society and the development of social life. It shapes our personalities and influences our perceptions and behaviour.

Cultural ecosystem services are the non-material benefits nature provides, such as cultural identity, aesthetic appreciation, spiritual enrichment, recreation, etc. They represent the manner in which people associate themselves with nature. Cultural landscapes like the Ganga River have been described as an "interface between nature and culture", wherein the palpable and impalpable heritage, and the biological and cultural diversity interact.

Bhagirathi, Mandakini and Triloka-patha-gamini in heaven, Ganges or Ganga on Earth, and Alakananda in the underworld are the names taken in reverence to the Ganga River. The Ganga River is not just a river but is considered sacred, a tradition, and a culture. In Hindu mythology, Ganga is personified as a goddess and is visualized as resting on her vahana, Makar.

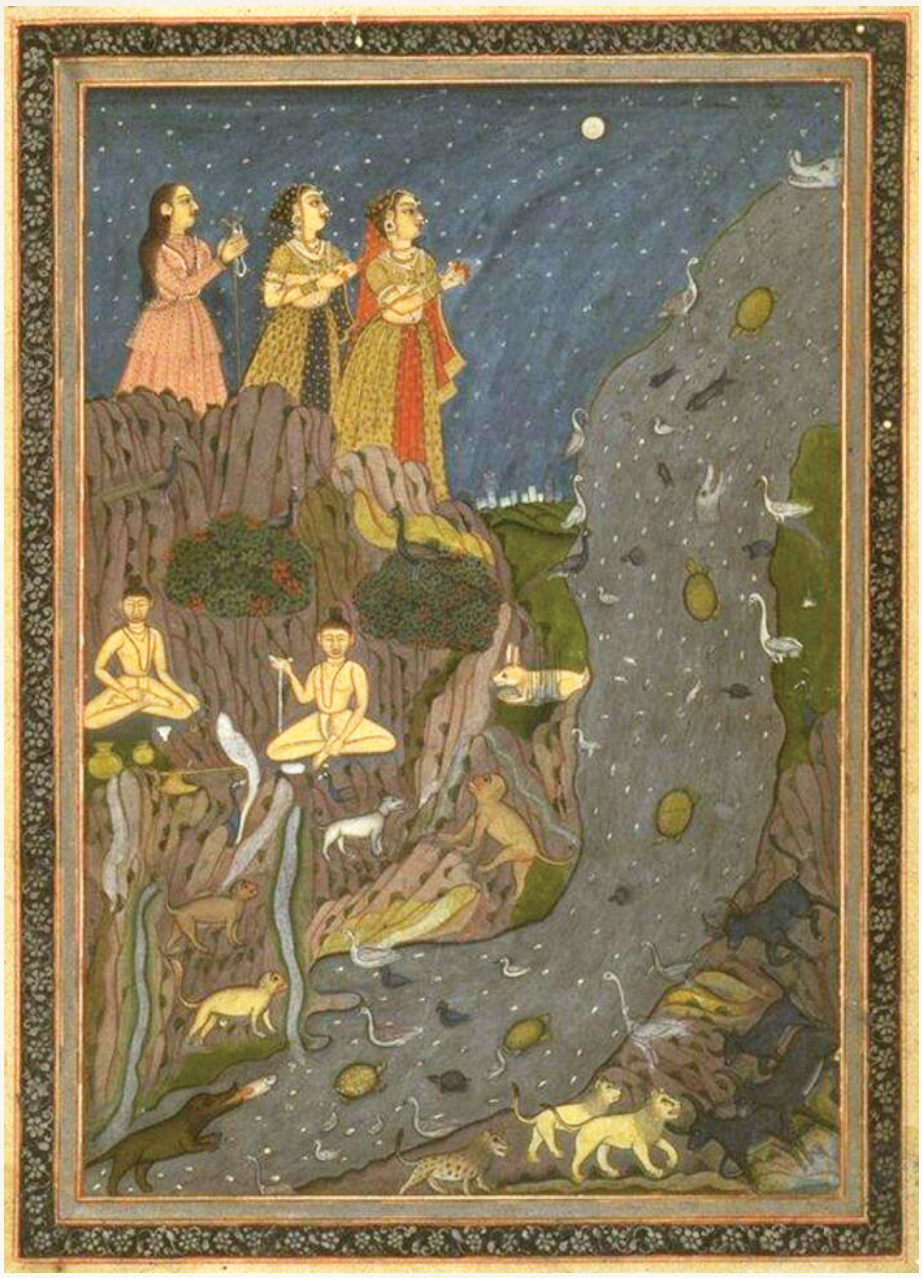

Photo: University of Michigan Museum of Art

The Descent of the Ganges, ca. 1775, at the University of Michigan Museum of Art.

This lyrical painting from Bundelkhand in Central India, shows the Ganga River flowing from the night sky. Ascetics sit cross-legged on the mountainside, offering their austerities to Shiva, while women come to venerate Ganga. The river and its banks teem with wildlife — crocodiles, turtles, fish, birds, lions, leopards, jackals, monkeys and rabbits. It is as if Ganga has restored life to the natural world.



Photo: Pariva Dobriyal

A local deity visiting the Ganga River at Devprayag, the confluence of the Bhagirathi and Alakhnanda rivers.

Photo: Vipul Maurya



An ascetic blowing the sacred *shankha* (translation: conch) at the Kumbh Mela in Prayagraj.



Photo : Deepika Dogra

Statue of Goddess Ganga resting on her vahana, Makar, at Gangasagar.

RIVERS AS 'CENTRES OF CIVILIZATION'

Since time immemorial, rivers and their cyclic annual flooding have been a great catalyst to the birth of civilizations and their evolution, especially the world's major primary civilizations (Guo, 2009). Many great ancient civilizations were centred in river valleys such as the Sumerians along the rivers Euphrates and Tigris and their tributaries, the Egyptians along the Nile River, the Harappan or Indus Valley civilization along the Indus River and the earliest Chinese dynasties around the Yellow River (or Huang He). After the fall of the Indus Valley civilization, a second urbanization emerged in the central Gangetic Plains (Nain, 2018; Misra, 2001). Archaeological evidence at ASI excavation sites such as Hulas, Alamgirpur, Mandi, Madarpur, Bhorgarh and more recently, Sinauli, in the Ganga-Yamuna Doab have provided evidence of their co-existence with the mature Harappan Civilization (Manjul & Manjul, 2018). The Vedic civilization flourished along the banks of several rivers such as Ganga, Yamuna, Saraswati etc. Rivers provide numerous invaluable benefits such as water for agriculture, irrigation, drinking and transportation, livelihood security, economic growth, etc.

"The history of the Ganga in nurturing culture and civilizations can be viewed from three angles— the fostering of native culture in its basin, the shifting of the Indus-Sarasvati basin civilization into its fold, and the promoting of cultural integration to develop Indian civilization."

— Dilip Kumar (2017)

Rivers played a significant role in the social and economic growth of these civilizations and in their cultural and aesthetic characteristics, which led to the emergence of mythologies, philosophies, traditions, rituals, and cultures. The cradle of cultural, religious, economic, and political evolution in northern India, the Gangetic plains have myriad forms of art, architecture, religion, food habits, and customs.

India's largest necropolis at Village Sinauli, District Baghpat, Uttar Pradesh, dates to about 1900 BCE. The cart burials unearthed are the first of their kind discovered for Bronze Age India. A) An aerial view of the necropolis; B) Chariot on display at the National Gallery of Modern Art; C) A fully intact copper sword; D) A copper chalice for ritualistic offerings (upside down in photo) with a turtle forming the base; E) A shield carried by a female warrior.

Photo : Frontline



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B

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C

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E

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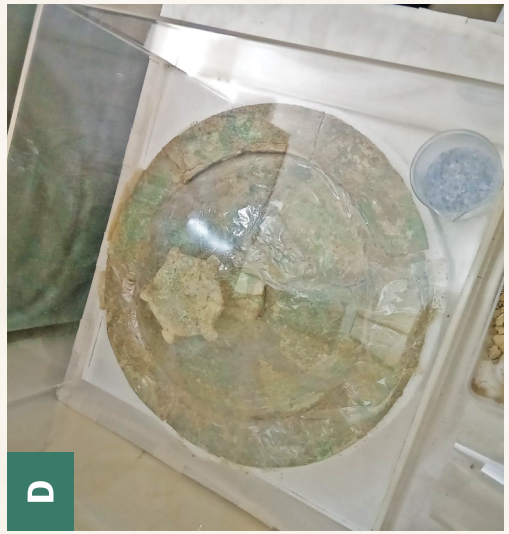

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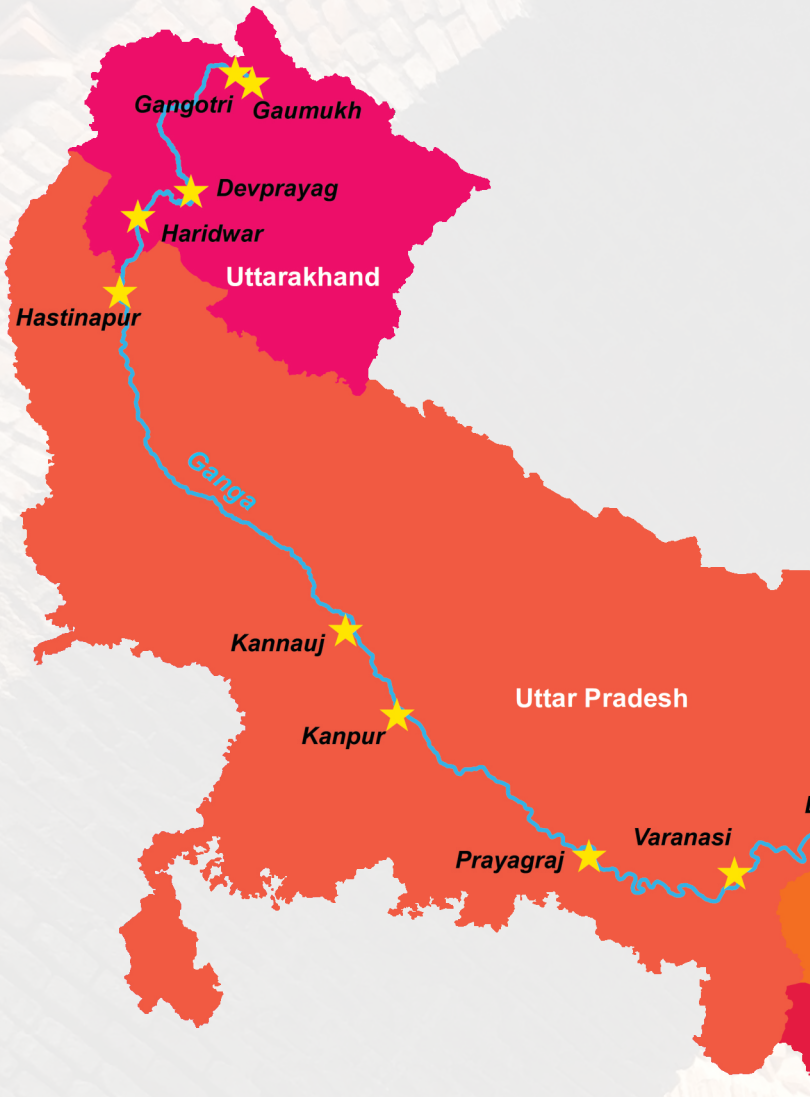
HERITAGE SITES

Ganga River, from Gaumukh to Gangasagar, is lined with places of cultural, religious, spiritual, historical and economic significance.





Gaumukh The snout of the Gangotri glacier and source of the Ganga River.



Gangotri One of the four sites in the '*Chhota Char Dham*' pilgrimage circuit - Yamunotri, Gangotri, Kedarnath and Badrinath.



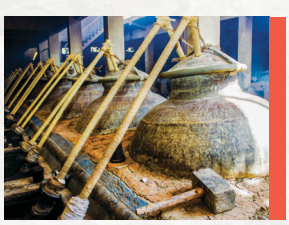
Devprayag Confluence of the Bhagirathi and Alaknanda rivers, beyond which the river is known as Ganga.



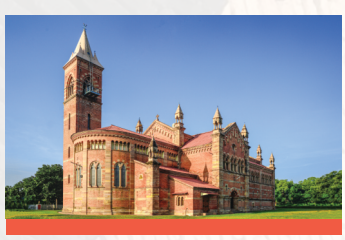
Haridwar - *'Gateway to the abode of Gods'* Ganga enters the Gangetic plains for the first time here. According to Hindu mythology, it was here that Shiva released Ganga from his locks and is among the seven holiest pilgrimage centres for the Hindus, *Sapta Puri*.



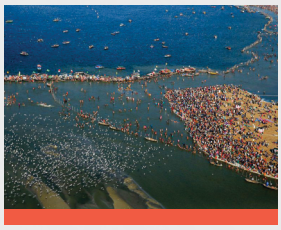
Hastinapur Described as the capital of the Kauravas of the Kuru Kingdom, in the Sanskrit epic Mahabharata. It is believed to be the birthplace of three Jain Tirthankaras.



Kannauj - *'Perfume capital of India'* Famous for its ancient perfume ('*attar*') industry. It was the capital of King Harshvardhan's empire.



Kanpur Major industrial centre in Northern India, with a thriving leather industry. Known as 'Manchester of the East', it was one of the main centres of industrial revolution in India. It was also an important British garrison during the colonial rule.



Prayagraj/Allahabad Also known as 'Prayag', is located at the confluence of three rivers viz., Ganga, Yamuna and the mythical Saraswati. Founded by Emperor Akbar, as recorded in Akbarnama, the city has been a political, cultural and administrative centre of the Ganga-Yamuna doab region.



Varanasi Earlier known as Banaras or Kashi, is one of the oldest continuously inhabited cities in the world and is as an important pilgrimage site for the Hindus. Sarnath, 8 kms away from Varanasi, is an important pilgrimage site for the Buddhists with its numerous stupas, monasteries and temples along with the museum.



Buxar The battle fought at Buxar in 1764 between the British East India Company and the joint forces of Mir Qasim, Nawab of Awadh, and Mughal Emperor Shah Alam II. This was a decisive victory for the British East India Company as it confirmed British power over Bihar and Bengal.



Patna The ancient city of Patliputra was the capital of the three major powers in ancient India - Nanda, Maurya and Gupta, and is the home of Panini, Chanakya, Aryabhatta, Vatsayana.

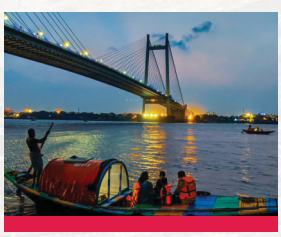


Bhagalpur - *'Silk city of Bihar'* Bhagalpur finds reference in the epics Ramayan and Mahabharat as the ancient kingdom of Anga, ruled by Karna. The city was a trading centre of import in historical records.





Gangasagar Situated at the confluence of the Hooghly River and the Bay of Bengal. The Makar Sankranti festival celebrations draws the second largest gathering of pilgrims in India.



Kolkata - *'Cultural capital of India'* It is the seat of contemporary Indian art, literature and culture. The blend of Eastern and Western cultures has led to numerous and diverse institutions. It houses the largest library and oldest museum in the country.

Map by :
NMCG-WII Project, GIS Lab, Ganga Aqualife Conservation Monitoring Centre, 2024

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SPIRITUAL GANGA

वरमिह नीरे कमठो मीनः किं वा तीरे शरटः क्षीणः।
अथवा श्वपचो मलिनो दीनस्तव न हि दूरे नृपतिकुलीनः

O Devi! It is better to live in your waters as turtle or fish, or live on your banks as poor "candal" rather than to live away from you as a wealthy king.

— Ganga Stotram: Devi Sureswari Bhagavati Gange composed by Sri Adi Shankaracharya

The water of the Ganga River, Ganga Jal, is considered holy by all religions and paths and is sprinkled as a benediction of peace. It is believed that a drop of Ganga Jal can cure all illnesses and purify any place, person or object. It plays a major role during the bereavement of living beings. People travel from distant places to perform the last rites of their ancestors on the banks of the Ganga River, and the ashes of the deceased are immersed in the Ganga for the salvation of the departed soul. People who pass away on the banks of the Ganga are believed to have attained moksha (emancipation).

Photo : Amanat K. Gill



Subah-e-Banaras, the morning *Ganga Aarti* at Assi Ghat, Varanasi.

As we move along the Ganga River, one comes across several religious sects and beliefs. The birthplaces for nine Jain Tirthankaras (7th, 8th, 11th, 12th, 16th, 17th, 18th, 23rd and 24th) are situated along the banks of Ganga, including Lord Mahavira at Vaishali. It was in the deer park at Sarnath, near the banks of the Ganga, that Lord Buddha gave his first sermon after attaining enlightenment. The Great Mauryan Emperor Ashoka built *Matths* (places of worship) for the followers of Buddhism and to spread the teachings of Buddha, including the Dhamek Stupa at Sarnath. The tenth Guru of the Sikhs, Guru Gobind Singh, was born on the banks of the Ganga at the site of Takht Shri Patna Sahib Gurudwara, which is an important pilgrimage site in Sikhism. Cutting across the narrow divide of religion, Ganga finds equal respect from the followers of all religious groups. The famous poet Khwaja Altaf Hussain Hali described the power of the Ganga to transcend the boundaries of religion and culture and amalgamate everyone within her waters.

"Woh din-e-hizazi ka bebak beda
Nishaan jiska aqsa-e-alam mein pahuncha
Mujahim hua koi khatra na jiska
na umm mein phatka, kuljhum mein jijhka
kiye be-saparjisnesaatonsamundar
woh dooba dahane mein Ganga ke aakar"

Photo : Kamal Joshi





Photo : Amanat K. Gill

Takht Sri Patna Sahib, the birthplace of the tenth Guru of the Sikhs, Guru Gobind Singh, is situated along the banks of the Ganga River at Patna, Bihar.

A devotee bathing in the Bhagirathi River viz., *Ganga snan*, at Gangotri Dham.



Photo : Deepika Dogra

Kapil Muni Temple at Gangasagar



Photo : The Metropolitan Museum of Art

A sculpture of Buddha preaching the first sermon at Sarnath from the Pala period (11th century CE), in Bihar (probably Nalanda, on display at the Metropolitan Museum of Art in New York.



FESTIVALS

"About 100 festivals and 50 major fairs are celebrated annually on the banks of the Ganga and more than 4-5 billion people yearly visit them. About 1 crore people make their living."

— Press Information Bureau, Ministry of Culture, Government of India (2016)

Ganga's Celestial Journey, is an annual procession that commences from Ma Ganga's winter abode in Village Mukhba on Akshaya Dwitiya, in the month of Vaisakha (April-May), and concludes the next day on the holy day of Akshaya Tritiya, when she arrives in Gangotri. The idol of the Goddess Ganga, adorned with ornaments, is placed on a palanquin decorated primarily in red and green colours. Celebrated with elaborate rites and rituals and great fanfare, this tradition has a recorded history of at least 700 years.

Kumbha Mela has one of the largest congregations of devotees for any festival in the world and was recognized by UNESCO as an 'Intangible Cultural Heritage' in 2017. It is held periodically, by rotation, at one of the four sites where the drops of *Amrit* (translation: nectar of immortality) fell after the mythological '*Samudra Manthan*' (translation: the churning of the ocean of milk), namely Haridwar, Ujjain, Nashik, and Prayagraj.

Maghi Purnima, also referred to as 'Adiwasi Kumbh' (Translation: Tribal Kumbh), holds an important place in the life and culture of the Santhal tribe of Jharkhand. Devotees from the Santhal Parganas viz., Deoghar, Dumka, Godda, Jamtara, Pakur and Sahibganj, congregate on the banks of the Ganga River at Rajmahal in Sahibganj, Jharkhand, take a holy dip in the Ganga River and perform their rituals. It is observed on the full moon in the month of Magh (January-February).

Ganga Saptami, also known as Ganga Pujan or Ganga Jayanti, is believed to be the day on which Ganga was reborn after being consumed by Sage Jahnu. It is observed on the 7th day of the waxing moon during the month of Vaishakha (April-May).

Ganga Dussehra celebrates the descent of the celestial Ganga River onto Earth and is observed on the 10th day of the waxing moon in the month of Jaishtha (May-June). During this festival, the idol of Goddess Ganga is wrapped in 108 colourful saris, one for each of her 108 names. Aquatic animals such as fish are fed flour balls.

Chhath Puja is an important festival for the people of the North Indian state of Bihar and parts of Jharkhand, Uttar Pradesh and Nepal with roots in Ramayana as well as Mahabharata. Dedicated to the Sun God and his wives Sandhya and Usha, the festival is celebrated on the sixth day of the month of Kartika (October-November). The rituals are spread over four days and include bathing, fasting without water, standing in water for long periods of time and offering arghya to the setting and rising sun.

Ganga Mahotsav is a five-day festival celebrated in Varanasi to commemorate the glory and sanctity of the Ganga River. It commences on 'Prabodhini Ekadashi' and concludes on 'Dev Deepawali/Kartik Poornima', the full moon day in the month of Kartik (October-November). This festival provides a platform for India's finest arts, crafts and culture.

April-May	Akshaya Dwitiya (Ganga's celestial journey), Ganga Saptami, Ganga Pushkaram Kumbh Mela (Haridwar, Uttarakhand), Buddha Mahotsav (Sarnath, Uttar Pradesh)
May-June	Ganga Dussehra
July-August	Kavad yatra
Oct-Nov	Ganga Mahotsav and Dev Deepawali (Varanasi, Uttar Pradesh), Kartik Purnima, Chhath Puja, Sonepur Harihar Kshetra Mela, Yama Dwitiya (Ganga's celestial journey)
Dec-Jan	Guru Gobind Singh Jayanti (Patna, Bihar), Makar Sankranti, Gangasagar Mela (Gangasagar, West Bengal), Kumbh Mela (Prayagraj, Uttar Pradesh), Magh Mela
Jan-Feb	Kumbh Mela (Prayagraj, Uttar Pradesh), Maha Shivratri, Bhishma Ashtami, Maghi Purnima Mela (Tribes in Rajmahal, Jharkhand)
Feb-March	Kumbh Mela (Prayagraj, Uttar Pradesh), Maha Shivratri
March-April	Kumbh Mela (Haridwar, Uttarakhand), Mahavir Jayanti (Vaishali, Bihar)



Photo : Kamal Joshi

Ganga's celestial journey from Mukhba to Gangotri on Akshaya Dwitiya.



Photo : Pariva Dobriyal

Boats ferrying people to the Sangam, the confluence of the rivers Ganga, Yamuna and the mythical Saraswati, during the Kumbh Mela at Prayagraj, Uttar Pradesh.



Photo : Shreenivas Yenni

A family making *rangoli* on Narad Ghat in Varanasi to celebrate Dev Deepawali.



Photo: Ganga Prahari Rahul Yadav

Women offering prayers during the Chhath Puja in the Ganga River at Varanasi, Uttar Pradesh.



SPECIES IN MYTHOLOGY

Makara - Gharial (*Gavialis gangeticus*), mugger (*Crocodylus palustris*) and estuarine crocodile (*Crocodylus porosus*)

Makara is the origin of the word 'mugger' in both the Hindi and English language, and means 'sea monster' in Sanskrit. A hybrid mythological being, the Makara is portrayed as the *vahana* (translation: the vehicle of a Hindu deity) of the river Goddess, Ganga, and the sea God, Varuna, in Hindu iconography. It is also the insignia on Kamadeva's flag. Folk artists often depict the Makara as a real animal, appropriating the Gharial found basking along the banks of the Ganga as Goddess Ganga's vahana. They are considered as the guardians of gateways and portals, and is believed to symbolize "chaos out of which order and creation arise".





Gangetic Dolphin (*Platanista gangetica*)

In Hindu mythology, it is believed that when Goddess Ganga descended from heaven, among the many creatures that appeared with her was the Gangetic Dolphin. It is also considered to be a *vahana* for the Goddess Ganga.



Matsya - the fish

Legend dictates that during the great flood, Vishnu transformed into a fish, *Matsya Avatar*, to save Manu, who was advised to build a giant boat and carry the seed of life along with the *Saptarishi* (translation: the seven ancient sages) for recreating a new world after the major destruction. Matsya, the first of the *Dashavatars* (translation: ten incarnations) of Lord Vishnu, is depicted as a four-armed figure, with the upper torso of a man and the lower part of a fish. This Avatar of Vishnu symbolizes the restoration of true knowledge, subverted by egoism, which has to be destroyed in the process. In Vedic texts, Matsya is associated with Prajapati Brahma.

One of the '*Ashtamangala*', or 8 auspicious symbols in Buddhism, is a pair of golden fish that usually appear standing vertically with heads turned inwards towards each other. An ancient pre-Buddhist symbol for Ganga and Yamuna, the fish represent embodied consciousness, happiness, fertility and abundance.

Kurma - the turtle

Kurma is the second of the *Dashavatars* (translation: ten incarnations) of Lord Vishnu. This incarnation of Vishnu is associated with the mythological story of *Samundra Manthan* — the churning of the ocean by *Devatas* (translation: Gods) and *Asuras* (translation: Demons) in search of amrita (translation: the elixir of immortality) wherein the divine serpent Vasuki presented himself as a rope, and Mount Mandara, placed on the back of Kurma, was used as a churning stick. In Vedic texts, Kurma is linked with Prajapati Brahma. One of the Saptarishis, the seven ancient sages who are considered the patriarchs of the Vedic religion, is Sage Kashyapa, which means “turtle” or “tortoise” in Sanskrit. The turtle/tortoise is portrayed as the vahana of the river goddess Yamuna.

Additionally, in Buddhism, in one of the Jataka Tales, Lord Buddha in one of his previous lifetimes takes the form of a turtle, who had vowed to save all sentient beings.





Kraunch - the Sarus Crane (*Grus antigone*)

The key event that sets the scene for the recitation of the poem is the death of a *kraunch* bird at the hands of a hunter, in chapter two of the first book of the epic Ramayana, the Balakanda. On a walk, prior to bathing in the Tamasa River, near Allahabad, Sage Valmiki came across a pair of sarus cranes ('kraunch') completely engrossed in each other. While admiring the birds, a hunter suddenly appeared and killed the male. The heart-wrenching cry of distress of the female and the death of the bird moved the sage to the extent that he spontaneously cursed the hunter, voiced in the form of a shloka. This shloka is believed to be the first ever Sanskrit verse.

mā niṣāda pratiṣṭhāṁ tvamagamaḥ śāśvatīḥ samāḥ
yat krauñcamithunādekam avadhīḥ kāmamohitam

The verse roughly translates to, "Oh hunter, may you repent for life and suffer, find no rest or fame, for you have killed one of the unsuspecting, devoted and loving krauñcha couple."

An exhaustive study of the verse by Julia Leslie (1998) considered 32 species and eliminated all but the sarus crane as the 'kraunch' bird in the verse.

SACRED GROVES

Sacred groves are commonplace in the old-world tradition of the bottom-up approach to nature conservation, which are still predominantly protected in rural, hinterland India. They are the patches of native flora, especially a forested composite of one or more species that hold spiritual, local, and medicinal significance to their immediate community. The cultural ecosystem services of the sacred grooves are manifested through the inter-generational retelling of folklore related to the ancestral spirits, local deities believed to be protecting the said sacred grooves, following the customary practices of conserving its biodiversity, which is profoundly connected with their lives, livelihood and well-being. The species that are considered part of sacred grove flora are arjun (Terminalia arjuna), mahua (Madhuca longifolia), banyan (Ficus benghalensis), peepal (Ficus religiosa), dhup (Canarium strictum), etc. The ambit of sacred groves doesn't only consist of terrestrial patches but also includes water bodies like ponds or lakes near a village temple, thus bringing out the sophisticated idea of preserving quintessential ecosystem services like provision of freshwater, especially during drought, regulation of micro-climate in a tropical region, flood protection to the riverine communities, etc.

It is widely believed that sacred groves derive their spiritual sanctimony from the animistic beliefs of primordial societies in India, which were later accommodated into Hindu and Buddhist traditions. However, the ecological significance of these preserved microcosmic ecosystems is also upheld by other religious communities like Muslims, as seen in the 'Siddhwari' sacred grove near the Ramghat Khader village along the Upper Ganga Ramsar site in District Bulandshahr, Uttar Pradesh.



Photo : X@SrikantMatrubai

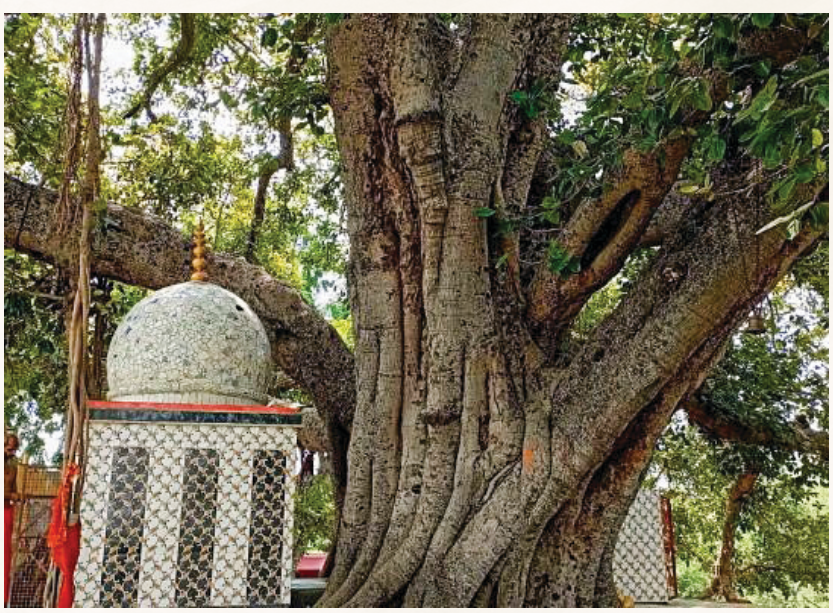


Photo: Mohana Basu, ThePrint

Siddhwari, is a small (7 ha), secluded forest patch in the middle of a fragmented landscape of agriculture and river floodplain. At the centre of the forest is a large ancient Indian Banyan tree, which has recently been radiocarbon-dated to be the oldest banyan tree in the world at 450 ± 50 years old. It is called 'Siddhwari Vriksha' by the locals and is known as a sacred wish-fulfilling tree. With a crown spread of 4,069 sq. m, it is the tenth-largest tree in the world. The ancient in situ conservation practice has maintained this tree and the sacred grove in the wake of competing regional development interests.







Photos: Patrut et al. 2020

The baobab of Jhunsi, Prayagraj, is an African baobab (Adansonia digitata) tree in the village of Jhunsi, near the sangam at Prayagraj. Popularly called 'Baba Shaik Ped' or 'Hathi ka Pawn', the tree is situated near the mazar (translation: tomb) of the Sufi Saint Saiyid Shah Sadrul Haq Taqiuddin (1320-1384). The baobab's age has been radiocarbon-dated to 750-850 years. The tree has immense medicinal value and is held sacred by both Muslims and Hindus alike.

Sacred groves of Jharkhand and Bihar, particularly in the Chotanagpur region, are a part of the social, cultural and ecological consciousness of the tribal communities in the region viz., Santhal, Munda, Kharia, Baiga, Ho and Oraon (or Kurukh). Locally called 'Sarna' or 'Jaherthan', these groves centre around the sal (Shorea robusta) tree. Other trees in the groves include mahua (Madhuca longifolia), neem (Azadirachta indica), peepal (Ficus religiosa), banyan (Ficus benghalensis), arjun (Terminalia arjuna), etc.

Photo : Pariva Dobriyal



A woman from the Santhal tribe in Jharkhand at the Magh Mela in Rajmahal, District Sahibganj.

GANGA - THE ETERNAL MUSE

"Ganga is also the river of creation. The cultural diversity of the Ganga basin is highly considerable. About 62 tunes, 254 types of songs and ballads, 122 dance forms, 200 crafts, 12 styles of folk paintings, 26 languages and dialects grew along the waves of Ganga."

— Press Information Bureau, Ministry of Culture, Government of India (2016)

Celebrated not only in mythology and legend, Ganga has been a source of inspiration to many an artist, seer, author, poet and craftsman. Their music and art find inspiration, not just in the constantly flowing river, but also in the floral and faunal species of Ganga. Beautiful compositions were born on the Ghats of Ganga, celebrating nature and its wonders. Ganga has been venerated, studied, examined and explored in literature and art. Numerous hymns have been composed and sung by sages and singers about its purifying waters, hallowing it as a sacred, cleansing river. Ganga has been painted by many an artist. Its waters have been the backdrop to many stories penned by authors and scriptwriters for movies and television. The Ganga River is a window into the heart and soul of India. It is an all-encompassing canvas to gather insights into the mythology, art, history and culture of India.



Photo : Nemai Ghosh

Ustad Bismillah Khan, the shehnai maestro, in his rendition of the Raag Bhairav "melds the traditional raag with praise for Allah".

Photo : Times of India



Bhupen Hazarika, the Bard of Brahmaputra, holds a mirror to society in his popular song 'Ganga beheti ho kyun'.



Photo : Christies

Battle of Ganga and Yamuna, 1971, painted by Maqbool F. Hussain, hailed as the 'Picasso of India', is a conceptualization of the Mahabharata, with the goddesses, Ganga and Jamuna, depicted as a conjoined being.

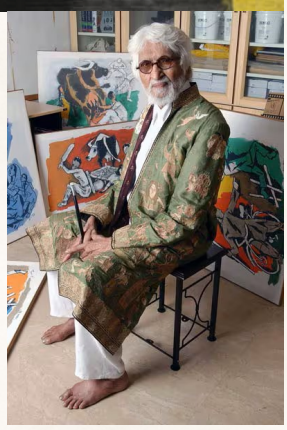
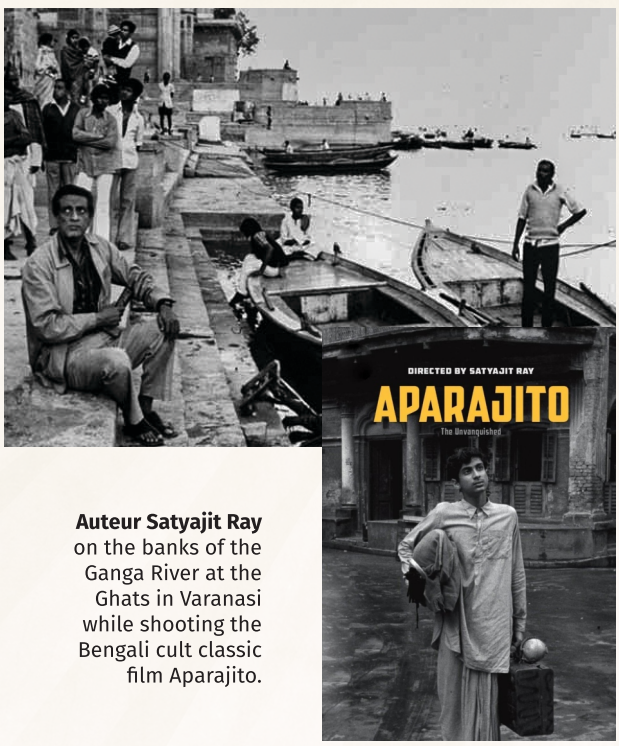


Photo : India Today

Photo : Nemai Ghosh



Auteur Satyajit Ray on the banks of the Ganga River at the Ghats in Varanasi while shooting the Bengali cult classic film Aparajito.



Photo : Bernard Gagnon CC BY-SA 3.0

***Gangavatarana*, or Arjuna's Penance**, at Mahabalipuram, is a bas-relief carved out of a giant boulder that represents either the myth of the 'Gangavatarana' (translation: Descent of the Ganga), with King Bhagirath imploring the God Shiva to bear the force of Ganga's waters on her descent from the heavens on to the earth, or the myth of Arjuna's penance to obtain the pashupatastra (a deadly divine weapon) from Shiva to use in the Mahabharata war. Ganga is symbolised by the water cascading from the cistern, down the cleft in the middle of the rock. This sculptural relief dates back to the 7th century CE, during the Pallava dynasty, and is a part of the Group of Monuments at Mahabalipuram UNESCO World Heritage Site.



Photo : Petar Milošević CC BY-SA 4.0

Fontana dei Quattro Fiumi, or Fountain of the Four Rivers, in Piazza Navona, Rome, was commissioned by Pope Innocent X Pamphilj, designed by Gian Lorenzo Bernini and unveiled in 1651. It features male personifications of four river Gods representing the four continents as then recognized by the Renaissance geographers viz., Ganga in Asia, Nile in Africa, Danube in Europe and Río de la Plata in America. The baroque sculpture of Ganga holds an oar, representing the river's navigability.

RECREATION

The Ganga River is lined with popular tourist destinations catering to all kinds of tourists, be it religious, spiritual, adventure, educational, etc. There are five protected areas along the Ganga River, covering around 10% of the mainstem. With scenic landscapes and rich floral and faunal diversity, wildlife enthusiasts and shutterbugs descend upon these sites, whether to see elephants in Rajaji National Park (NP), gharials and turtles in Hastinapur Wildlife Sanctuary, tigers in Rajaji NP or Sundarbans Biosphere Reserve or the Gangetic dolphins in Vikramshila Gangetic Dolphin Sanctuary. The river offers a range of adventure sports, be it rafting and riverside camping in Rishikesh or hiking/trekking in Gangotri NP. The Tehri reservoir in District Tehri Garhwal hosts Asia's biggest lake festival and provides a host of activities like boating, jet skiing, banana rides, water skiing, surfing, canoeing, river rafting, parasailing, kayaking, etc. Architectural and archaeological treasures in the form of forts and palaces, places of worship, etc. inherited from the numerous dynasties and kingdoms that thrived on its banks, from the Mauryan empire to the Mughal rule to the colonial era, draw history buffs from around the globe. Millions of devotees embark on the *Char Dham yatra* or *Kavad yatra* every year. The Ashrams in Rishikesh and the Ghats in Varanasi invite foreigners and locals alike in search of spiritual enlightenment.



Photo : Mohit Payal

Parasailing at the Tehri Lake, or Tehri Dam reservoir.

Photo : Mohit Payal



River rafting at Rishikesh.



Photo : Amanat K. Gill

Ganga Aarti at Dashahwamedh Ghat in Varanasi, Uttar Pradesh.



Photo : Rahul Yadav

Children playing in the mud along the banks of the Ganga River to beat the summer heat.



Photo : Saurav Gawan

A boat ferrying visitors to the Sajnekhali Wildlife Sanctuary in the Sundarbans, a UNESCO world heritage site.

GANGA FOR SCIENCE

National and international scholars have studied various aspects of the Ganga River as a cultural, social, religious and ecological entity. Ganga River as a keyword produces more than 7,21,00,000 results on Google and more than 1,04,000 results on Google Scholar. A search on HOLLIS, Harvard Library's online catalogue, generated 82,176 results for articles, dissertations, books, reviews, book chapters, journals, archives/manuscripts and technical reports related to the Ganga River. These results represent the amount of research work that has been conducted on the Ganga River. There are numerous universities, institutes and colleges located along the river. Hemwati Nandan Bahuguna Garhwal University, Aligarh Muslim University, the University of Allahabad, Banaras Hindu University, Patna University and St. Xavier's College, to name a few. Close proximity to the Ganga affords the opportunity to conduct research on the river and its attributes. Aligarh Muslim University has 48 theses and dissertations on or about Ganga River. A search on the Shodhganga website, which is a digital repository of theses and dissertations submitted to Indian universities; 'Ganga' as a keyword generated 7,805 results. Banaras Hindu University set up Malaviya Research Centre for Ganga, River Development and Water Resources Management in 2015, a knowledge centre dedicated to Ganga-related R&D activities. A Ganga Aqualife Conservation Monitoring Centre was established at the Wildlife Institute of India, Dehradun, for 'science-based conservation planning and dissemination of information' in 2016. India's first National Dolphin Research Centre, a research centre dedicated to conserving India's National aquatic mammal, the Gangetic river dolphin (*Platanista gangetica*), was established in Patna, Bihar, in 2024.



Photo : Goura Chandra Das

A team from the Wildlife Institute of India conducting an hydrological survey along the Ganga River.

Photo : www.iitbhu.ac.in



Banaras Hindu University, established in 1916 by Mahamana Pt. Madan Mohan Malaviya.





Photo : Goura Chandra Das

National Centre for River Research, a state-of-the-art centre for water resources management and conservation of aquatic biodiversity in India, at the Wildlife Institute of India, Dehradun.

Ganga River's cultural ecosystem services are varied in their scope, intensity, and relational value established between people and nature. This variation is guided by the riverscape of the Ganga River like its origin, confluences, meanderings channels, shoals and mouth, which are venerated in the local cultural milieu of societies thriving in their vicinity. and have guided the rise of urban epicentres in Indian history from the ancient megapolises like Hastinapur and Varanasi to medieval mercantile trading and cultural melting hotspots like Kannauj, Patna and Bhagalpur, and modern industrial hubs like Kanpur, and Kolkata. These distinct religious, cultural, historical and economic centres lined along the Ganga River mark it as the cradle of Indian civilization and a breeding ground of distinct polity and philosophies. Ganga and its banks also harbour rich and diverse flora and fauna, which have further enriched the cultural tapestry of the region as seen in its folk art, songs, stories, festivals, religious iconography and sacred groves. Recognizing, highlighting and safeguarding these non-material benefits of the Ganga Riverscape, along with its tangible benefits, can strengthen its conservation efforts by involving the people who derive intangible benefits like a sense of place and meaning of life from this living divinity. The cultural services of the Ganga River are an amalgamation of India's distinct and vast cultural identity developed across several millennia as it has assimilated various religious, ethnic, cultural, and philosophical strands like the river collects the waters and sediments of its innumerable tributaries.

Photo : Pariva Dobriyal





Table: Studies evaluating the Cultural Ecosystem Services of Rivers

Study Site	Cultural Ecosystem Service	Methodology/Value Description	Values	Reference
Tajan River Basin, Iran	Conservation	Willingness to pay by choice experiment	$2.35/household, annually	Amirnejad, H., Hosseini, S., & Azadi, H. (2024). Evaluation and valuation of Tajan river basin ecosystem services. *Ecohydrology & Hydrobiology*.
Todgha Oasis, Morocco	Recreational	Willingness to pay by contingent valuation method	€188,700, annually	Allali, K., Fadlaoui, A., Arib, F., de-Miguel, M. D., & Alcon, F. (2023). Economic valuation of cultural services at the Todgha Oasis, Morocco. *Journal for Nature Conservation*, 73, 126371.
Rio Grande Basin, United States	Recreational	Willingness to pay by contingent valuation method	$8.1/respondent, annually, for recreational activities	Wang, W., Mu, J. E., & Ziolkowska, J. R. (2021). Perceived economic value of ecosystem services in the US Rio Grande Basin. *Sustainability*, 13(24), 13798.
	Heritage Value		$7.1/respondent, annually, for cultural heritage	
Hudson River Park and its estuary, New York, United States	Environmental Education	Travel cost method	$7500 to $25,500, annually	Hutcheson, W., Hoagland, P., & Jin, D. (2018). Valuing environmental education as a cultural ecosystem service at Hudson River Park. *Ecosystem Services*, 31, 387-394.
Pateira de Fermentelos freshwater wetland in Cértima sub-catchment of the Vouga river basin, Portugal	Conservation	Willingness to pay using benefit transfer	€1.54 to €2.02 million, annually	Roebeling, P., Abrantes, N., Ribeiro, S., & Almeida, P. (2016). Estimating cultural benefits from surface water status improvements in freshwater wetland ecosystems. *Science of the total environment*, 545, 219-226.

Study Site	Cultural Ecosystem Service	Methodology/Value Description	Values	Reference
Colorado River Basin, United States	Recreation (2009 USD)	Direct expenditures for fishing, hunting and wildlife watching in the U.S.	$4.1 billion, annually	Kaval, P. (2011). Ecosystem service valuation of the Colorado River Basin: A Literature Review and Assessment of the Total Economic Value of the Colorado River Basin. *The Nature Conservancy,* Washington, DC.
		Flow-on impact for fishing, hunting and wildlife watching in the U.S.	$10.5 billion, annually	
		Recreation consumer surplus values for the entire basin (including Mexico)	$3.4 billion, annually	
		Direct expenditures for whitewater rafting in the state of Colorado	$55 million, annually	
		Flow-on impact for white water rafting in the state of Colorado	$141 million, annually	
		Direct expenditures for National Parks	$960 million, annually	
		Flow-on impact for National Parks	$1.3 billion, annually	
	Preservation	Colorado household value to preserve wilderness and forest quality	$73-$83/Colorado household/year	
		Routt County Colorado household value to preserve the scenic landscape view of ranch lands	$155-$371/Routt County Colorado household/year	
		For every $1.00 the NRCS spends on programs, $1.60 is spend in the economy as direct expenditures and $2.49 is the total output or flow on impact	$1.60 on total value added and $2.49 on total output	
Sundarbans National Park, India	Recreation	Zonal Travel Cost Method	INR 15 million	Guha, I., & Ghosh, S. (2009). A Glimpse of the Tiger: How Much are Indians Willing to Pay for It?. *SANDEE*, Nepal.
Yangtze River estuary, China	Cultural		0.84 billion Yuan RMB	Wu, L., Lu, J., Tong, C., & Liu, C. (2003). Valuation of wetland ecosystem services in the Yangtze River estuary. *Resources and Environment in the Yangtze Valley*, 12(5), 411-416.
	Recreation		0.48 billion Yuan RMB	



Photo : Saurav Gawan

NMCG

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