


**Subject: Tourism & Hospitality**

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**Paper 10: Tourism Products of India**

**Module 36: River System of India**



**THE DEVELOPMENT TEAM**

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ITEMS	DESCRIPTION OF MODULE
<b>Subject Name</b>	Tourism and Hotel Management
<b>Paper Name</b>	Tourism Products of India
<b>Module Title</b>	River Systems of India
<b>Module Id</b>	36
<b>Pre- Requisites</b>	Elementary knowledge of Geography of India
<b>Objectives</b>	i) to give basic knowledge of rivers, drainage pattern, river system, ii) highlight the river front and tourism
<b>Keywords</b>	River systems, drainage, tourism

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## QUADRANT-I

### 1. Learning Outcomes

This unit deals with the drainage pattern of India. It is explained through major river systems of India such as Himalayan Rivers and Peninsular Rivers. The general nature of the river, tributaries, course, major issues such as pollution, flood, etc., rivers and tourism are outlined. Rivers are not only providing the water resources, but it also symbolizes cultures developed along the river side. Several important cities in India are situated on the river banks; these cities create a web of economic activities with the resources of these water bodies. After completion of this unit, the student will have a good understanding of river systems, rivers of India and rivers and tourism development.

### 1.0 Introduction

Rivers are a vital resource base for any nation. River banks also act as the cradle of civilizations. Tiber, Nile, Tigris, Indus and Ganges are some of the very important rivers in the world, which have immensely contributed to the growth of civilisation and supported the mankind. Rivers of India has been illustrated in the sacred Vedic literature. These river networks act as key contributors to the economic, socio-cultural, environmental and political fabric of the country in various ways. The rivers, while flowing through vibrant ecological and cultural landscape of India, also instil the feeling of national integrity and a sense of responsibility to protect our natural resources. Rivers also support our life through various ways for eg. Irrigation, hydro-electric projects, drinking water schemes etc. Rivers also offer a plethora of economic opportunities. Many riverside cities/townships are popular pilgrimage centres. Many rivers and river banks attract large number of tourists. Exploitation of rivers resulted in an impending crisis of water scarcity, flash flood, presence of high content of metals and bacteria, etc. Rivers are considered as goddess and sacred, but the intimidation with nature also threatens micro-organism to human beings. It is very important to protect our rivers which are also the lifeline of our nation. The recent initiative of government to declare the rivers with the

equal status of human beings is considered to be a bold decision to protect our rivers from degradation.

This module discuss the important rivers of India. A brief sketch of drainage pattern and systems are mentioned and the detailed study of rivers are followed thereafter. Threats to the very existence of the rivers will give a glimpse of the pertinent issues such as encroachments, pollution etc. Rivers as a potential tourism resource is the last part of the module which highlights how rivers contribute to tourism activities and converting river fronts as tourist attractions. In addition to the examples and cases discussed in the module, students can also conduct observations of the nearby rivers and prepare a project on the potential of river tourism, scale of developments and key issues and threats to the river, which will give an onsite experience.

## **2.0 Drainage Pattern**

According to Majjid Hussain, drainage pattern is a geometric arrangement of streams in a region. It is determined by slope, rock resistance, weathering and erosion, landscape, hydrology etc. It is interesting to see that streams and tributaries forms a particular pattern that creates a particular shape. The following shapes are

- **Antecedent Rivers:** Ancient Rivers are called antecedent rivers, which existed before the upheaval of Himalayas. These rivers did not changed the course even after the major tectonic shifts. Eg. Ganga, Indus, Arun, Teesta, Brahmaputra etc.
- **Consequent Pattern:** Rivers flowing through the original slope of geologic beds are called as consequent rivers. The slope determines the course of the river.
- **Subsequent Pattern:** These rivers develop a drainage pattern that is changed/modified from its original course due to erosion in the underlying non-resistant rock. The streams develop their valleys along the regional faults, or less resistant rocks. Godavari, Krishna etc. are examples of subsequent rivers.
- **Superimposed Pattern:** These are rivers established in a cover of rock, but later the rock cover is moved due to erosion and river is freed from the channel it existed. Damodar, Subarnarekha, Chambal etc. are examples.

- **Dendritic Pattern:** This pattern is the most common pattern of rivers found. Several streams joined together in to the tributaries of the main river. It resembles a tree. It develops in a terrain with uniform lithology.
- **Trellis Pattern:** Small streams flow parallel and form the main river. The steep slopes force the streams to flow straight with few tributaries. Eg. Streams originate at Ladakh range
- **Barbed Pattern:** The confluence of a tributary intends to go upstream, not downstream in barbed pattern. Eg: Jhelum at Muzaffarabad.
- **Rectangular Pattern:** This pattern features right angled bends and right angled junctions.
- **Radial Pattern/Centripetal:** outflowing rivers from a central point. Eg: rivers originating from Amarkantak (Narmada, Mahanadi and Son) are examples.
- **Braided Pattern:** are formed by a network of interconnected channels with shallow streams. It is being supported by the alluvial materials.
- **Annular Pattern:** Streams follow curving pattern prior to join the main stream. It can be explained as the streams drain from a dome type structure or basin, where erosion has exposed rimming sedimentary strata. Eg: upper part of Shigar.

### 3.0 River Systems

Rivers can be classified on the basis of catchment area. A major river is having a catchment area of 20000 sq. k.m or above. Catchment area with 2000-20000 sq. k.m. is called medium river and river with less than catchment area of 2000 sq. k.m. is called a minor river. In India, we have 14 major rivers, 44 medium rivers and a large number of small rivers. Based on the origin we can classify the Indian river system broadly in to two categories;

**Himalayan Rivers and Peninsular Rivers.** Rivers originate in the slopes of Himalayan Mountains and the Tibetan plateau flows through India are included in the former, whereas the rivers originate at Vidhyan hills, Satpura hills, Westen Ghat and other hill ranges are included in Peninsular rivers.

Himalayan Rivers are perennial rivers, which have water all through the year, whereas the peninsular rivers depend on rains. 77 % of the rivers flowing towards east direction and joins

the Bay of Bengal and 23 % of the drainage is towards the Arabian Sea. In general, river systems are classified as

- Indus River System
- Ganga-Brahmaputra-Meghana River System
- The peninsular rivers

#### 4.1 **Himalayan Rivers**

Indus, Ganga and Brahmaputra are the three main rivers originating in Himalayas which are also treated as Himalayan rivers. Himalayan rivers, deepened its original course, while the mountain upheaval take place. These deep gorges prove that Himalayan rivers are older than other rivers. Pasco & Pilgrim (1919) proposed a theory Indo-Brahma flowed through the entire subcontinent from east (Assam) to west (Punjab) and emptied its waters in Gulf of Sindh near lower Punjab during Miocene period. Successive upheavals of Himalaya due to tectonic shifts resulted in uplifting of Tibetan Plateau. This also blocked the flow of rivers, and diverted in gradual course of time. This theory was not accepted by many scholars.

##### 4.1.1 **Indus**

Indus originates from Bokhar Chu glacier of Mt. Kailas. It drains largest number of glaciers of Himalayas. In Tibetan China it is called Singikhamban means lions mouth. It enters in India at Ladakh other streams join in its course to Arabian sea to complete a distance of 2880 K.M, in which 709 k.m. it pass through India. Main tributaries of Indus at Himalayan ranges are Shyok, Gilgit, Shigar, Zaskar and Hanle. It has a river basin of 321289 sq. km river basin in India. Kabul River joins at Attock. The Indus Water Treaty (1960) between India and Pakistan is a mutual agreement to share the Indus water resources. This agreement further classifies Sutlej, Beas and Ravi as the east flowing rivers, and Indus, Jhelum and Chenab as the west flowing. It describes the use of water resources for domestic, non-consumptive use etc.

## **Tributaries**

**Jhelum (Vitasta):** Rises at Verinag, at the slopes of Pir Panjal range and flows through the city of Srinagar. The main tributaries of Jhelum are Lidder, Sind and Kishenganga. River Lidder is originating at Chandanwari Glacier and merges with Jhelum at Anantnag. River Kishenganga originate near Sonamarg and River Sind originates at Machoi Glacier at an elevation of 4800 m, east of Amarnath Caves.

**Chenab (Asikini):** Rises from Rakas Lake in Tibet. It is known as Chandrabhaga in Himachal Pradesh. In its course, it flows through the Pangi Valley and enters in Pakistan, where it merges with River Jhelum at Trimmu in Pakistan.

**Ravi (Purushini/Travati):** It originates in the Himalayas (altitude 4300 m) at the Multan Tehsil of the Kangra District. It flows through Bara Bangal, Bara Bansu and Chamba districts. Two major tributaries of this river is Budhil and Mai. The Budhil rises at Manimahesh Kailash Peak and Manimahesh Lake which is an important Hindu pilgrimage site. It drains between the area of Dhauladar ranges and Pir Panjal Ranges. Ravi is the smallest of the five other rivers of Indus river system.

**Beas (Vipasa):** The river rises in the Himalayas (Beas Kund, altitude: 4361m) near Rohtang Pass in Central Himachal Pradesh. It flows through Himachal Pradesh and Punjab. Main tributaries of this river are Parbati, Harla, Sanji and Tirthan.

**Sutlej (Shatadru):** It is the longest of the five rivers under Indus River System. It originates from Rakas lake which is connected to the Mansarovar Lake and flows through Tibet. It is the eastern most tributary of Indus. This river flows below the base of Shimla and enters in Punjab. It is called as Langqen Zangbo or Elephant Spring. Baspa and Spiti are the two main tributaries of Sutlej. The following table indicates the Indus river system in a nutshell.

Indus	Originates at Kailas range close to Mansarovar lake
Jhelum	Verinag
Ravi	Near to Rohtang Pass
Beas	Near to Rohtang Pass
Satulj	Rakas Lake near Mansarovar
Chenab	Bara-Lachha la

#### 4.1.2 Ganga

River Ganga is the heritage river of India. The plains created River Ganga and Yamuna in the states of Uttarakhand, Haryana, Uttar Pradesh, Madhya Pradesh, Bihar, Jharkhand and West Bengal is one the best fertile lands in the world. Ganga originate as Bhagirathi from Gangotri Glacier (base of Chaukamba Peak) at an elevation of 7010 meters. In its course, it cuts through the Himalayan Mountains, creates spectacular gorges. It meets River Alakananda at Deoprayag. At Hardwar, river enters in to the Doon Valley, thereafter its flows over the slope terrain. Major tributaries of River Alakananda are Pinder, Mandakini, Nandakini and Dhauliganga. Main tributary of River Bhagirathi is Bheling.

Ganga River System is constituted by

- River Yamuna and its territories
- Kali River and its tributaries
- The Ghagra River System
- The Gandak River System
- The Kosi River System

**River Yamuna:** the largest tributary of River Ganga. It raises at Yamunotri glacier, base of Banderpunch peak in the main Himalayan Range. The gradient is higher at the upper



tract, which also result in deep gorges, enters in to Doon Valley through the Mussoorie Ridge at Kalsi. It flows through Uttarakhand, Haryana, Delhi, at Allahabad,(Uttar Pradesh), it merges with River Ganges.

Main tributaries of River Yamuna (Non Peninsular) are

- River Tons
- River Aglar
- River Giri
- River Bata
- River Asan Rao

Peninsular tributaries join River Yamuna include

- Chambal : Originate at the southern Malwa plateau and flows in a north east direction through the borders of Rajasthan and Madhya Pradesh then enters in Uttar Pradesh and finally merges with Yamuna.
- Betwa : Also known as Betravati, it originates at the Vindyan Range in Madhya Pradesh. It enters at Orcha in Uttar Pradesh and finally merges with Yamuna.
- Ken : It originates at the north west slopes of Berner Ranges in Madhya Pradesh and Merges with River Yamuna at Banda in Uttar Pradesh. It is one of the most important rivers of Bundelkhand region. There is an active proposal to link Betwa river and Ken river in order to supply water at drought prone areas of Bundelkhand.

**Sone River:** Originates at Amarkantak region in Madhya Pradesh, flows through UP, cuts through the Kaimur ranges in Bihar and merges with River Ganga near Patna. It has a high gradient at the beginning and during rainy season. It becomes shallow and remains as a thin stream during summers. Sone River has a very wide channel at Dehri on Sone ( up to 5 k.m.). two major tributaries of Son are Rihand and Koel.

**Other (Left bank) Tributaries of River Ganga**

*Ramganga*: Originates at lower Himalayan slopes (Kumaon Region) of Uttarakhand. It flows through the Dun Valley, through the Jim Corbet National Park, near Nainital it enters in to plains. It joins Ganga near Kannauj in Uttar Pradesh. Ganga Dussehera is celebrated at Chabari Village in Bareilly in the month of October/November.

*Ghaghra (Karnali)* : It rises in Nepal Himalayas. It is the longest tributary of the Gandak basin. The main spring of this river originates at Tibet. In India it is called as Sarju, on its banks, Ayodhya is situated. The river joins Ganga at Doriganj in Bihar. It is the largest tributary of Ganga in terms of the volume of water it drains. The main tributaries of Ghaghra are Sarda and Rapti.

*Gomti* : According to Hindu Mythology Gomti is believed to be the daughter of Sage Vasisht. It originate from Gomat Taal in Northern Uttar Pradesh.

*Gandaki* : It is known as Narayani in Nepal and Gandak in India. The confluence of rivers, Gandaki, Pachnad and Sonha is known as Triveni. It lies between Kosi River in the east and Ghaghra in the west. Gandaki meets River Ganges at Sonapur.

*Burhi Gandak or Old Gandak*. It originates near Indo Nepal Border, flows parallel to Gandak, join Ganga near Khagaria in Bihar.

*Mahananda*: Rise in West Bengal, it joins river Ganga at Jharkhand, West Bengal Border.

*Koshi River*: It is also called as Sapt Kosi because of its upper tributaries.

River Tamur: It is the eastern tributary of river Kosi, originating at Kanchenjunga

*Arun*: It rises at the trans Himalayan Range.

*Sun Kosi*: it originate at southern Tibet. Its tributaries are Dudh Kosi, Bhote Kosi and Bhote Kosi and Indravati Kosi, Tamba Kosi and Indravati Kosi.

Indravati: it drains at the eastern side of Kathmandu.

Bhote Kosi: Originate from Cho-Oyu and Gauri Shanker Massif.

Dudhkosi: Drains from the snow melt areas of Mt. Everest.

Barun: Rises at the Barun glacier at the base of Makalu

Koshi River joins River Ganga at Kursela at Kathihar.

#### **4.1.3 Brahmaputra:**

It rises at Tibet, flows east in to the southern Tibet, enters in India as Dihang. It flows through 1700 km. in China, near Lhotse Dzong, it opens up a navigable channel, for about 640 km, further a series of rapids. It enters in to great loop in to the south west of Arunachal Pradesh. 720 k.m it flows through Assam. The downstream (confluence of Dibang, Lohit and Dihang) is known as Brahmaputra. Brahmaputra River System include

Teesta River: Rises from Zemu glacier on the eastern side of Kanchenjunga. Main tributaries are Lachung, Rangit, and Lhonak.

Torsa: it enters Arunachal Pradesh from Bhutan

Raidak: Drains a part of Western Bhutan

Manas : Part of Bhutan and Arunachal Pradesh, flows through Assam before it joins Brahmaputra.

Kameng: Rises from Kangto group of peaks.

Subansiri: It is also known as Gold River, flows through the tropical forests of Arunachal Pradesh and merges with Brahmaputra at Majuli in Assam. In its total stretch, 170 km is in Tibetan territory, 250 k.m. in Eastern Himalayas, and 86 k.m. in Assam.

#### **4.2 Peninsular rivers**

Peninsular rivers are much older than Himalayan Rivers. Most of these rivers are non-perennial and mainly depend on rains. Rivers are characterised by broad valleys and low gradient. The east flowing rivers form deltas during its course to sea, whereas most of the west flowing rivers sea or form estuaries. The source of the peninsular rivers include Western Ghats, Aravallis, Vindhya and Satpura ranges.

#### **4.2.1 Narmada**

River Narmada is the third longest river of the Peninsular Rivers and the longest west flowing river. It originates at Narmada Kund in Amarkantak, flows through the rift valley of Vindhya and Satpura ranges, covering a long distance in Madhya Pradesh and finally merges at Arabian Sea. It acts as the life line of three states viz. Madhya Pradesh, Maharashtra and Gujarat. Ptolemy and Periplus mentioned this river in their writings.

It is one of most holy rivers treated with great reverence by Hindus. Omkareshwar, Maheswar are located on the banks of river Narmada. Popular saying is Narmada ke Kanker utte Sankar means pebble stones of Narmada get a personified form of Shiva. Pachmarhi is a popular hill station visited by large number of tourists is the highest point of Narmada basin. Sardar Sarovar Dam project, a series of small and big dams in Narmada aimed to provide water supply to domestic and industrial purposes.

#### **4.2.2 Mahanadi**

Mahanadi means the great river. It rises at the extension of eastern ghats, Damtari district of Chattisgarh, enters in Odisha and merges with Bay of Bengal near Paradip. It has a length of 851 k.m. It is bounded by the Central India Hills on the north, Eastern Ghats on the South and east and Maikala range on the West. Based on water potential and flood producing capacity this river occupies second position in the peninsular rivers. Main tributaries of the river are Seonath, Hasdeo, Mand, Ib, Ong, Tel and the Jonk.

#### **4.2.3 Godavari**

The Godavari river basin mainly covers Maharashtra, Andhra Pradesh and a small share of Madhya Pradesh and Odisha. The basin is bounded by the Satmala hills on the north, Ajanta range and the Mahadeo Hills on the south east by eastern ghats and west by western ghats. It rises near Nashik in Maharashtra at an elevation of 1067 meters. The total length of this river is 1465 k.m. Main tributaries of Godavari are Pravara, Wardha, Mula, Wainganga, Penganga, Pranhita, Manjira, Indravati and Sabari. The western edge of the river basin gets abundant rain fall during monsoons as the springs originate from

the slope of western ghats at an elevation ranges from 400 meters to 2500 meters. It create a delta approximately with a width of 170 k.m. at while merging at Bay of Bengal.

#### **4.2.4 Tapi River**

Tapi river (also known as Tapti) is a river of Central India. The river basin extends over Madhya Pradeh, Maharashtra and Gujarat. It is bounded by Satpura ranges on the north, Mahadeo hills on the east and Ajanta ranges and Satmala hills on the south and Arabian Sea on the West. Tapi is the second largest west flowing river in the peninsula. It rises in Multai reserve forests in Betul District of Madhya Pradesh at an elevation of 702 meters. The total length of the river is 724 km.

There are 14 major tributaries out of which 4 on the right bank and 10 on the left bank. Purna, Girna, Gomai and Panzara are some of the important tributaries.

#### **4.2.5 Krishna**

The Krishna basin lies in Maharashtra, Karnataka, Maharashtra. Krishna river is bounded by Balaghat ranges on the north, Eastern ghats on the south and the east and western ghats on the west. The source of the river is at an elevation of 1337 m near to Mahabaleswar, in western ghats. The total length of the river is 1400 km.

#### **4.2.6 Cauveri**

River Cauveri originates at Talakaveri, Coorg hills of Karnataka. It is also called as Daskhin Ganga. The river water is the main source of drinking water and irrigation source for Karnataka and Tamil Nadu. The drainage basin was shared among the former states and Kerala and Pondicherry. It is bounded by Western Ghats on west, Eastern Ghats on the east Krishna basin and Pennar basin on North. The total length of the river is 804 km. The river empties in Bay of Bengal. The tributaries of Cauveri are Bhavani, Kabani, Suvarnavati, Hemavati, Harangi, and Shimsha.

At Shivanasamudra, the river splits in to two branches and joins at Hoggenakkal after a number of rapids and series of waterfalls. Hoggenakkal Waterfalls attract large number of tourists. The Cauveri delta begins after the river crosses Tiruchirappalli (Trichi). The river creates Srirangam Island, in its course. The Great Chola Kings constructed Anicut (an

ancient dam, dates back to 2<sup>nd</sup> A.D.) to use the river water for irrigation purposes in the delta of Cauveri.

River Cauveri is the major irrigation source for the farmers of Karnataka and Tamil Nadu. This river highly depends on South West Monsoon, and due to poor rain fall in the last couple of years in the upper streams, farmers face severe crisis due to drought and lack of irrigation facilities.

### 4.3 Other Rivers

**Barak :** It covers an area of 52000 sq.k.m. River Barak originate at the border of Nagaland and Manipur, flows westward and turn south till it reaches Manipur. It enters in South Assam, further flows towards Bangladesh. It has a length of 525 km.

**Subarnarekha:** Subarnarekha means the streak of the gold. Gold was mined near the origin point and the name was given due this connection. The source of River Subarnarekha is Piska near Ranchi. During its course, it flows through Jharkhand, West Bengal and Odisha. The total length it traverse is 395 k.m. It is a rain fed river. The mouth of the river is near Kirtania Port, Odisha.

**Brahmani-Baitarani:** River Brahmani is a seasonal river. The source of the river is near Rourkela, with the confluence of River Koel and Sankh. The head rivers are originating near Ranchi in Jharkhand.

**Pennar:** It is an east flowing river, originates at Chikabellapur in Karnataka, flows through Andhra Pradesh and merges with Bay of Bengal at the end. Pennar drains at the northern part of Kolar Plateau. The mouth of the river at Bay of Bengal creates a large wetland area, up to a width of 7 km. The lagoon created by this river is called as Isakappalli.

**Mahi, Dhadhar:** It is a west flowing river, rises at Madhya Pradesh, flows through Rajasthan and Gujarat in course and merges with Arabian sea. The length of the river is approximately 580 k.m. it is popularly called as Mahisagar, and also considered as a sacred river by large number of people.

**Sabarmati:** It is a west flowing river originate at the Aravalli Hills in Rajasthan. It flows a distance of 371 k.m in South Western direction and empties in Gulf of Cambay. Mahatma Gandhi, father of our nation established his ashram on the banks of Sabarmati River in Ahmedabad. The Sabarmati River front project at Ahmedabad is an example of river front development.

**Luni:** It originates at Ajmer, Aravalli ranges of Rajasthan, flows through the Marwar region and drains out at Kutch. The length of the river is 495 km. At the source it is known as Sagarmati. Maharaja Jaswant Singh constructed the artificial lake Jaswant sagar in order to serve the water to the people of the region.

**Vaigai:** The source of Vaigai river is Western Ghats. It flows through the eastern part of Tamil Nadu such as Kambam Valley, Madurai and finally empties at Bay of Bengal. After River Cauveri, this river serves a very important role for the farmers of Tamil Nadu in terms of drinking water and irrigation.

### **5.0 Rivers, River front and tourism**

Rivers act as a tourism resource and people are attracted to river banks mainly religious purposes, but adventure tourism and leisure activities are promoted in a large way at many rivers. The high gradient rivers and rapids attract adventure tourists to take up rafting activities. Boat cruises are a big attraction in several rivers. River banks are also the venues for largest gathering of the world such as Kumbh Mela (held at once in 12 year on the banks of Rive Ganges (Haridwar and Allhabad), Godavari (Nasik) and Shipra (Ujjain).

Several cities came up along the river banks and these cities emerged as important pilgrimage centres or the cities of commercial importance. Indus (Sindhu) valley civilisation and its development draw the attention of people of the west to South Asia (India, Nepal, Bangladesh, Afghanistan and Pakistan) or Saptha Sindhava/Aryavartha. Ganga- Brahmaputra-Meghna river system played a key role as the life support of

millions of people in different ways. Pataliputra, the confluence of Son, Ganga was the capital chosen by Magadha Kings to strengthen their kingdom during the period of Lord Buddha. Important cities located on the prominent rivers of India are mentioned below.

<b>City</b>	<b>River</b>
Leh	Indus
Srinagar	Jhelum
Jammu	Tawi
Manali	Beas
Kangra	Beas
Haridwar	Ganga
Kanpur	Ganga
Prayag	Sangham (Ganga, Yamuna, Saraswati)
Varanasi	Ganga
Lucknow	Gomti
Ayodhya	Saryu
Patna	Ganges
Bodh Gaya and Gaya	Niranjana/Phalgu
Kolkata	Hooghly
Guwahati	Brahmaputra
Dibrugarh	Brahmaputra
Jorhat	Brahmaputra
Imphal	Imphal
Cuttack	Mahanadi
Bhubaneswar	Daya
Vijayawada	Krishna
Jabalpur	Narmada
Mumbai	Mumba
Panajim	Mandovi



Mysore	Kabani
Kochi	Periyar
Madurai	Vaigai
Chennai	
Ahamdabad	Sabarmati

River front projects: Sabarmati riverfront project is one of the model project designed in the bank of River Sabarmati. Landscaping and creation of recreational space for the tourists, entertainment activities and food courts etc. have been designed. Several other cities, located on different river fronts have also been proposed for the development. As part of this efforts have been taken up by state and central government authorities to facilitate and support the projects with multiple purposes like reducing pollution, encroachment, river rejuvenation etc. Over the years, several rivers have been badly polluted and this resulted in bringing down oxygen levels, paused serious threat to the micro organism and aquatic life. Aarti (a traditional ritual) conducted at the evening and morning hours at the ghats of River Ganga in Haridwar and Varanasi attract large number of pilgrims and international tourists. River Teesta, Beas, Chambal, Zanzkar etc. attract adventure tourists. Tourism also act as a cause to protect the rivers from pollution as increasing awareness about the responsibilities of tourists and service providers help in such directions as tourism is highly depending on the clean environment.

### **Rivers and Major Issues**

Exploitation of rivers created serious threats to our environment although climate challenge and related issues are part of that. Illegal encroachments along river banks and construction of commercial as well as residential buildings shrinked the river banks and several streams have already been disappeared. This also cause flash floods and waterlogging during rainy season. Water pollution is another major issue, which threatens even the existence of all living creatures. The presence of bacteria that are harmful to human beings and other creatures are also found in many rivers. Government and private agencies have been working for the improvement of the water quality of rivers.

## 6.0 Summary

Rivers are treated with great reverence in India. Almost all rivers in India represent the mythical characters or association with traditions and belief system. Rivers are perceived as life and every stage of human life and there are lot of emotional and religious attachments. The river systems are the economic arteries of our nation, uniting force of diverse cultures and part of social life. The river systems also have a great influence on our day to day life as the source of drinking water, irrigation and energy, rivers play a vital role. Study on rivers, help us to understand the ecological systems, bio-diversity, geographical features and socio-economic connections and religious importance etc. Rivers also play key role in the tourism development of India. River cruises, adventure programmes, religious gatherings and melas such as Kumbh Mela, Pushkaralu, etc. attract lot of tourists. As an example, boating in river Ganga in the early morning hours is part of tour itineraries. This is with an intention to provide the riverfront view of the holy city of Varanasi, with golden rays of morning sun fall on the endless ghats and rising towers of temples and traditional buildings. This boating give a unique experience to the visitors as they immerse themselves to listen to the greatness of the city, its history, religious and spiritual importance. Classical music, yoga, aartis, rituals by pilgrims, cremations etc. describe the cultural features of India and its deep connection with River Ganga. Similarly every river in India carries its legacy, cultural importance and ecological features, be it Narmada or Brahmaputra.

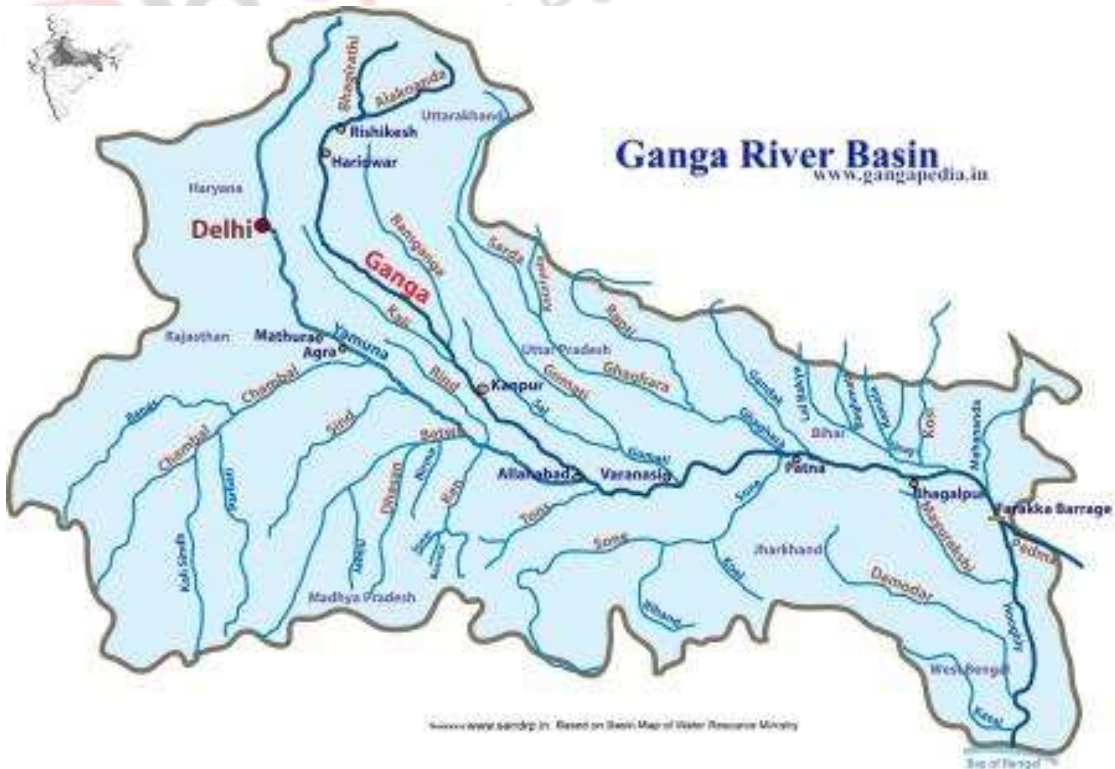
## Images



River Chader, Trekking (Source: Google)

Google)

River Indus and Its Tributaries (Source:



(Source: <http://chimalaya.org>)

A small house boat  
in River Jhelum at  
Srinagar

(Source: Author)



River

Ganges at Varanasi, (Source: Author)



River Narmada at Beda Ghat, (Source: Author)



Newly inaugurated Bhupen Hazarika Bridge on Brahmaputra, the longest in India  
(Source: Google)



Sabarmati River front Project (Source : <http://www.narendramodi.in/glimpses-of-the-scenic-gardens-at-sabarmati-riverfront-jointly-inaugurated-by-shri-l-k-advani-and-shri-narendra-modi-5628>)



Sundarbans



(Source: Google)

Prakasam Barrage over River Krishna, Andhra Pradesh (Source: Google)



Traditional Boats at River Cauvery. (Source: Images)

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