

GEOGRAPHY

INDO-GANGETIC PLAIN

1. Introduction:

The Indo Gangetic Plain, is also known as the Northern plains and the North Indian River Plain. It is a very large, very fertile area of land that covers most of northern and eastern India, the most populated parts of Pakistan, parts of southern Nepal, and almost all of Bangladesh. It is named after the two rivers that drain into it, the Indus and the Ganges, and is home to many people, of varied religions. Its bordered to the north by the Himalayas, the south by the by the Vindhya- and Satpura Range, and the Chota Nagpur Plateau and the west by the Iranian Plateau. It is also one of the most populated areas in the entire world, with over 1/7th of the world's population.

To the south of the Himalayas and to the north of the peninsula lies the great plain of North India. It is an aggradational plain formed by the depositional work of three major river system that is the Indus, Ganga and the Brahmaputra. The plain is also known as Indo-Gangetic Brahmaputra plain.

The Indo-Gangetic belt is the world's most extensive expanse of uninterrupted alluvium formed by the deposition of silt by the numerous rivers. The plains are flat making it conducive for irrigation through canals. The area is also rich in ground water sources.

The plains are one of the world's most intensely farmed areas. The main crops grown are rice and wheat, which are grown in rotation. Other important crops grown in the region include maize, sugarcane and cotton. The Indo-Gangetic plains rank among the world's most densely populated areas.

2. Origin of the Indo-Gangetic Plain:

It is almost universally accepted that this vast plain has been formed as a result of filling of a deep depression lying between the Peninsular and the Himalayan region by the depositional work of the rivers coming from these two landmasses.

However, divergent views have been expressed regarding the origin of this great depression and the process of filling it. Wadia postulates that these planes were originally a deep depression or furrow lying between the Peninsula and the mountain region.

The great Austrian geologist Edward Suess has suggested that a "foredeep" was formed in front of high crust waves of the Himalayas as they were checked in their southward advance by inflexible solid landmass of the Peninsula.

This fore deep was like a large syncline in which alluvium brought by the Himalayan and the Peninsular Rivers was deposited. In due course of time, this was filled with alluvium and the Great Plain of North India was formed. It rests on the hard and crystalline rocks through which the region is connected to the Himalayan and the Peninsular blocks.

Sir Sydney Burrard, on the other hand, thinks that the Indo-Gangetic alluvium conceals a great deep rift, or fracture, in the earth's sub-crust, several thousand metres deep, the hollow being subsequently filled up by the trital.

Such sunken tracts between parallel, vertical dislocations are called 'Rift Valleys'. The rift valley between the Himalayan ranges and the Peninsula which gave birth to this plain was about 2,400 km long and hundreds of metres deep. He described some other rift valleys of the Himalayan region as well as the rift valleys of Narmada and Tapi in the Peninsular India.

Scholars like Hayden and R.D. Oldham as well as other geologists of the Geological Survey of India have not accepted Burrard's view of the Indo-Gangetic depression. The main objection to Burrard's views is that there is no trace of a rift valley at the northern edge of the Peninsula and that such a vast rift valley is not possible.

According to the recent views expressed by many geologists and geographers, sediment deposited at the bed of the Tethys Sea was folded and warped due to northward drift of the Peninsula. Consequently the Himalayas and a trough to the south were formed.

3. Geomorphology of the Indo-Gangetic plain:

The Indus-Ganga plains, also known as the "Great Plains," are large floodplains of the Indus and the Ganga-Brahmaputra river systems. They run parallel to the Himalaya Mountains, from Jammu and Kashmir in the west to Assam in the east and draining most of northern and eastern India. The plains encompass an area of 700,000 km² and vary in width through their length by several hundred kilometres. The major rivers of this system are the Ganga and the Indus along with their tributaries; Beas, Yamuna, Gomti, Ravi, Chambal, Sutlej and Chenab.

Extent of the Indo-Gangetic plain across South Asia. The great plains are sometimes classified into four divisions:

- The **Bhabhar belt**: it is adjacent to the foothills of the Himalayas and consists of boulders and pebbles which have been carried down by the river streams. As the porosity of this belt is very high, the streams flow underground. The bhabhar is generally narrow about 7–15 km wide.
- The **Terai belt**: it lies next to the Bhabhar region and is composed of newer alluvium. The underground streams reappear in this region. The region is excessively moist and thickly forested. It also receives heavy rainfall throughout the year and is populated with a variety of wildlife.
- The **Bangar belt**: it consists of older alluvium and forms the alluvial terrace of the flood plains. In the Gangetic plains, it has a low upland covered by laterite deposits.
- The **Khadir belt**: it lies in lowland areas after the Bangar belt. It is made up of fresh newer alluvium which is deposited by the rivers flowing down the plain.

The Indus-Ganga belt is the world's most extensive expanse of uninterrupted alluvium formed by the deposition of silt by the numerous rivers. The plains are flat and mostly treeless, making it conducive for irrigation through canals. The area is also rich in ground water sources.

The plains are the world's most intensely farmed areas. The main crops grown are rice and wheat, which are grown in rotation. Others include maize, sugarcane and cotton. The Indo-Gangetic plains rank among the world's most densely populated areas.

4. Regional divisions of the great plain of north India:

According to morphology of the northern plain of India, it can be divided into 4 major parts, owing to distinct alluvial deposit and direction of river flow in the area. The 4 divisions are:

- The Rajasthan Plain.
- The Punjab-Haryana Plain.
- The Ganga Plain and
- The Brahmaputra Plain.

The Rajasthan Plain:

The western extremity of the Great Plain of India consists of the Thar or the Great Indian Desert which covers western Rajasthan and the adjoining parts of Pakistan. The desert is about 650 km long and 250-300 km wide. Its total area is about 2.0 lakh sq km out of which 1.75 lakh sq km lies in India.

About two thirds of the Indian desert lies in Rajasthan, west of the Aravali Range, and the remaining one third is in the neighbouring states of Haryana, Punjab and Gujarat. Recently, some geomorphic studies by using remote sensing techniques in conjunction with ground truth were undertaken by the Central Arid Zone Research Institute, Jodhpur.

This vast desert is an undulating plain whose average elevation is about 325 m above mean sea level. It descends to about 150 m above mean sea level near the Indo-Pak border as well as towards the Indus Valley and the Rann of Kutch.

The desert proper is called Marusthali and accounts for greater part of the Marwar plain. The average elevation of the Marusthali is 200-250 m above sea level. The eastern part of the Marusthali is rocky while its western part is covered by shifting sand dunes locally known as dhrian.

The eastern part of the Thar Desert, upto the Aravali Range is a semi-arid plain which is known as the Rajasthan Bagar. It runs in a north-east to south-west direction from the edge of the Aravalli in the east to the 25 cm line joining places of equal rainfall in the west.

It is drained by a number of short seasonal streams originating from the Aravali and supports agriculture in some patches of fertile tracts called rohi. Even the important river, the Luni, is a seasonal stream which flows towards the south-west to the Rann of Kutch. The tract north of the Luni is known as thali or sandy plain.

The Punjab-Haryana Plain:

The Great Indian Desert imperceptibly gives way to the fertile plains of the Punjab and Haryana towards the east and north east. The entire plain extends for a length of 640 km in north-west to southeast direction and is about 300 km wide in east-west direction.

The general slope is towards south-west. Its elevation varies from 275 metres in the north to 213 metres in the south-east and 176 metres near Fazilka in the south-west. The Ravi, the Beas and the Sutlej drain only one-fourth of the area of this region.

The Yamuna drains only a narrow strip of land lying on its right bank. The Ghaggar which flows past Jakhhal and Sirsa is rainy season stream. Apart from the Ghaggar no other river perennial or non-perennial crosses the 362 km long strip of land stretching between Delhi and Fazilka.

The Sarasvati too poured its water into Ghaggar. The Ghaggar later dwindled to insignificance because the Sutlej changed its course and began to flow westwards from Ropar to merge into the Beas, and the headwaters of the Sarasvati were captured in stages by the westward shift of the course of the Yamuna. In south Aravalli range breaks the monotony of the plain.

There are two climate types, humid sub-tropical with dry winters and sub-tropical steppe prevail in this region. The rest of the area which forms the major part of this plain, has sub-tropical steppe climate.

A major part of the annual rainfall is received in the months of July, August and September. Western depressions bring a few centimetres of rainfall during the months from December to April. There is hundred per cent electrification of villages and towns of this region.

The Ganga Plain:

This is the largest unit of the great plain of India stretching from Delhi to Kolkata in the states of Uttar Pradesh, Bihar and West Bengal covering an area of about 3.75 lakh Sq Km. This plain has been named after the river Ganga. The Ganga along with its large number of tributaries originating in the Himalayan ranges is the Yamuna, the Gomati, the Ghaghara, the Gandak, the Kosi, etc. have brought large quantities of alluvium from the mountains and deposited here to build this extensive plain. The peninsular rivers such as Chambal, Betwa, Ken, Son, etc. joining the Ganga river system have also contributed to the formation of this plain. The general slope of the entire plain is to the east and south-east. Depending upon its geographical variations, this plain can be further sub divided in to 3 divisions:

1. The upper Ganga plain
2. The middle Ganga plain and
3. The lower Ganga plain

The Upper Ganga Plain:

Comprising the upper part of the Ganga Plain, this plain is delimited by the 300 m contour in Shiwaliks in the north, the Peninsular boundary in the south and the course of the Yamuna river in the west.

The plain is about 550 km long in the east-west direction and nearly 380 km wide in north-south direction, covering an approximate area of 1.49 lakh sq km. Its elevation varies from 100 to 300 m above mean sea level.

The Middle Ganga Plain:

To the east of the Upper Ganga plain is Middle Ganga plain occupying eastern part of Uttar Pradesh and Bihar. It measures about 600 km in east-west and nearly 330 km in north-south direction accounting for a total area of about 1.44 lakh sq km. Its northern and southern boundaries are well defined by the Himalayan foothills and the peninsular edge respectively.

The most accepted boundaries are those made by 100 m contour in the west, 75 m contour in the north-east and by 30 m contour in the south-east. Obviously this is a very low plain, no part of which exceeds 150 m in elevation.

This plain is drained by the Ghaghara, the Gandak and the Kosi rivers, all tributaries of the Ganga coming from the Himalayas.

The Lower Ganga Plain:

This plain includes the Kishanganj tehsil of Purnea district in Bihar, the whole of West Bengal and most parts of Bangladesh. It measures about 580 km from the foot of the Darjeeling Himalaya in the north to Bay of Bengal in the south and nearly 200 km from the Chotanagpur Highlands in the West to the Bangladesh border in the east.

The total area of this plain is about 81 thousand sq km. Its width varies greatly and it narrows down to a mere 16 km between the Rajmahal Hills and the Bangladesh border. The 50 m contour roughly corresponds with its western boundary.

Brahmaputra Plain:

This is also known as the Brahmaputra valley or Assam Valley or Assam Plain as most of the Brahmaputra valley is situated in Assam.

Though often treated as the eastern continuation of the Great Plain of India, it is a well-demarcated physical unit girdled by the Eastern Himalaya of Arunachal Pradesh in the north, Patkai and Naga Hills in the east and the Garo-Khasi-Jaintia and Mikir Hills in the south.

Its western boundary is formed by the Indo-Bangladesh border as well as the boundary of the lower Ganga Plain.

The entire plain covers an area of about 56 thousand sq km. It is an aggradational plain built up by the depositional work of the Brahmaputra and its tributaries. The Brahmaputra River enters this plain near Sadiya and flows farther to Bangladesh after turning southwards near Dhubri.

The general level of the plain varies from 130 m in the east to 30 m in the west. The average gradient of the land is 12 cm per km in the N.E. to S.W. direction. The area is well demarcated by 150 m contour beyond which the surrounding hill terrain dominates the scene.

5. Significance of the Indo- Gangetic Plain :

With its fertile alluvial soils, flat surface, slow moving perennial rivers and favourable climate, the Indo-Gangetic Plain is of great significance. It is the home of about half of the Indian population although it accounts for less than one fourth of the total area of the country.

The plain supports some of the highest population densities depending purely upon agro-based economy in some of these areas. The extensive use of irrigation has made some parts of this plain, especially Punjab, Haryana and Western part of Uttar Pradesh the granary of India.

The entire plain except the Thar Desert, has a close network of roads and railways which has led to large scale industrialisation and Urbanisation. The development of trade and commerce in this plain is a natural sequel of industrialisation and Urbanisation. There are many religious places along the banks of the sacred rivers like the Ganga and the Yamuna which are very dear to Hindus. Here flourished the religions of Budha and Mahavira and the movements of Bhakti and Sufism. In short, this vast plain is the heartthrob of India and constitutes its very soul.

Conclusion:

The Indo-Gangetic plain is irrigated by three important rivers, the Ganges, Indus and Brahmaputra. This vast plain is most fertile and productive because of the alluvial soil brought by the streams of the rivers and its tributaries.