Uttar Pradesh :Geographical location

Uttar Pradesh is the fifth largest State of India after Rajasthan, Maharashtra, Madhya Pradesh and Andhra Pradesh in area. For administrative purposes, the state is divided into 18 divisions and 75 districts. There are 303 sub divisions, 313 Tehsils, 11 Municipal Corporation, 689 Cities, 820 community development blocks, 52,000 Gram Sabha, 1,07,452 revenue villages, out of which 97,941 are inhabitant and 9,511 uninhabitant in the state.

Uttar Pradesh, the most populated state is located in the northern region of India and shares its borders with Nepal on the north, the Indian states of Uttarakhand and Himachal Pradesh towards the northwest, Haryana, Delhi and Rajasthan on the west, Madhya Pradesh on the south, Chhattisgarh and Jharkhand to the southeast and Bihar in the east.



Uttar Pradesh is Situated between **23°52'N and 31°28'N** latitudes and **77°3′ and 84°39'E** longitudes (Important)
Uttar Pradesh can be divided into three distinct physical regions based on the Physical Settings :

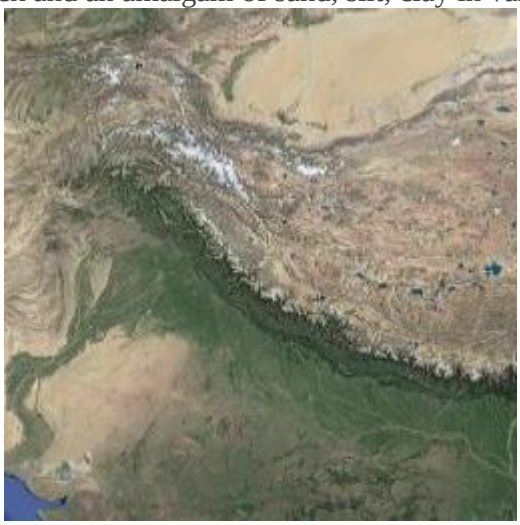
- The Shivalik foothills and Terai in the North
- The Gangetic Plain in the centre – Highly fertile alluvial soils; flat topography broken by numerous ponds, lakes and rivers; slope 2 m/km
- The Vindhya Hills and plateau in the south – Hard rock Strata; varied topography of hills, plains, valleys and plateau; limited water availability.

The southern most range of Himalayas is known as Siwalik. The Himadri and Himachal ranges of the Himalayas have been formed much before the formation of Siwalik range. The rivers rising in the Himadri and Himachal ranges brought gravel, sand and mud along with them, which was deposited in the rapidly shrinking Tethys Sea. In course of time, the earth movements caused folding of these relatively fresh deposits of sediments, giving rise to the least consolidated Siwalik range. The average height of the Siwalik range is very low, about 600 metres only.

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Uttar Pradesh :Relief and Structure

The Ganga plain which dominates the landscape and nearly covers three fourth of the geographical area of the State, lies between the rocky Himalayan belt in the north and the southern hilly tract comprised of mainly Pre-Cambrian rocks. Flexing of the Indian lithosphere in response to the compressive forces due to collision, and thrust fold loading produced the Ganga Plain foreland basin. It is filled with recent alluvial sediments which are at places more than 1,000 m. thick and an amalgam of sand, silt, clay in varying proportions.



The southern hilly tract is roughly parallel to the Ganga-Yamuna lineament. The tract is underlain by granitic complex in Bundelkhand region and in Sonbhadra. It is overlain by rocks Mahakoshal (Bijawar) and Vindhyan Super group. The younger rock comprise of coal bearing Gondwana in south Sonbhadra and basaltic rocks in southern part of Lalitpur.

The granitic complex is considered to be potential for the search of metallic minerals like copper, lead, zinc, molybdenum, gold, nickel, Uranium and Platinum group of elements. The overlying sediments of Mahakoshal (Bijawar) and associated Iron Formation show a potential for the search of copper, uranium, and gold in Lalitpur and andalusite, sillimanite, gold, calcite, marble and clay in sonbhadra.

The lower Vindhyan sediments of Sonbhadra contain deposits of cement grade limestone, flux grade dolomites, building stone and are also potential for the search of placer gold and other metals.

The Upper Vindhyan sandstones are suitable for making decorative slab/tiles or ballast. Deposits of silica sands and bauxite are available in Allahabad and chitrakoot districts while coal deposits occur in the Gondwana rocks in southwestern corner of Sonbhadra.

The thin strip of land running from Saharanpur in the west to Deoria in the east is known as Bhabhar and Terai. The Bhabhar area in Saharanpur, Bijnor and Pilibhit districts skirts round the Shivalik hills. Torrential streams and rivers desending the mountaineous slopes slow down here, leaving behind boulders brought from the upper reaches of the Himalayan hills. Some 34 Kilometers in width in the west, the tract goes on getting narrower in its march towards the east. Smaller streams seem to get lost in the thick mass of boulders but reappear some distance away, moving slowly and depositing a thin layer of soil which converts itself into a marshy patch called the Terai.

The Terai area, which runs through parts of Saharanpur, Bijnor, Rampur, Barelly, Pilibhit, Lakhimpur Kheri, Bahraich, Gonda, Basti, Siddarthnagar, Gorakhpur, Mahrajganj and Deoria districts was once a belt, some 80 to 90 kilometers wide , covered with forests and tall, dense grasses. In the recent years, however, owing to the land acquisition programme of the State Government the Terai belt has shrunk considerably, Wheat, rice and sugar cane are the main crops grown in Terai together with jute in certain stretches.

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Outside the Terai and Bhabhar belt, the plains are fertile and flat save certain trans-Yamuna portions in Agra and Mathura districts where ravines and red stone hillocks abound on the eastern end of the Arawali range.
Irrigated by Ganga, Yamuna and their tributaries, the plains slope in two formations- from north to south in the west and west north to south east in the east, yielding two major crops a year i.e. rice in Kharif & wheat in Rabi Season.

The climate of Uttar Pradesh

The climate of Uttar Pradesh (U.P.) is primarily defined as humid subtropical with dry winter (CWa) type with parts of Western U.P. as semi-arid (BS) type.

However based on the Köppen climate classification, it can be classified mostly as Humid Subtropical with dry winter type with parts of Eastern U.P. as Semi-Arid (BS) type.

U.P. has a climate of extremes. With temperatures fluctuating anywhere from 0 °C to 50 °C in several parts of the state and cyclical droughts and floods due to unpredictable rains, the summers are extremely hot, winters cold and rainy season can be either very wet or very dry.

The primary temperature, rainfall and wind features of the three Distinct Seasons of U.P. can be summarized as below:

18 Summer (March–June): Hot & dry (temperatures rise to 45 °C, sometimes 47-48 °C); low relative humidity (20%); dust laden winds.

Monsoon (June–September): 85% of average annual rainfall of 990 mm. Fall in temperature 40-45° on rainy days.

Winter (October–February): Cold (temperatures drop to 3-4 °C, sometimes below -1 °C); clear skies; foggy conditions in some tracts. Given significant climatic differences,

U.P. has been divided into two meteorological subdivisions – U.P. East and U.P. West. IMD office situated at Airport, Lucknow is nodal for providing all the weather related forecasts & details.
Average Rainfall

Precipitation in Uttar Pradesh is primarily a summer phenomenon, the Bay of Bengal branch of the Indian Monsoon is the major bearer of rain in most parts of U.P. It is the South-West Monsoon which brings most of the rain here, although rain due to the western disturbances and North-East Monsoon also contribute small quantities towards the overall precipitation of the state.

The mean south-west monsoon (June, July, August & September) rainfall (799 mm) contributes 84.4% of annual rainfall (946 mm). Mean monthly rainfall during July (268 mm) is highest and contributes about 28.3% of annual rainfall. The mean rainfall during August is slightly lower and contributes about 26.5% of annual rainfall. June and September rainfall contribute 11.2% and 18.4% of annual rainfall, respectively. Contribution of pre-monsoon (March, April & May) rainfall and postmonsoon (October, November & December) rainfall in annual rainfall is 7.1% and 4.9% respectively. Coefficient of variation is higher during the months of November, December,January and February.

Uttar Pradesh	1,025 mm
Plain of West Uttar Pradesh	896 mm
Hills of West Uttar Pradesh	1,667 mm

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Rivers of Uttar Pradesh

1. **Ganga-** Ganga is formed by 6 headstreams and 5 of their confluences. Bhagirathi is considered as source of river ganga which rises at the foot of gangotri glacier at gamukh at an elevation of 3892 mts, though there are many small streams that feed bhagirathi . The six headstreams are the Alaknanda, Dhauliganga, Nandakini, Pindar, Mandakini, and Bhagirathi rivers. The five confluences, known as the Panch Prayag, are all along the Alaknanda. They are, in downstream order, Vishnuprayag, where the Dhauliganga joins the Alaknanda;Nandprayag, where the Nandakini joins; Karnaprayag, where the Pindar joins, Rudraprayag, where the Mandakini joins; and finally, Devprayag, where the Bhagirathi joins the Alaknanda to form the Ganges River proper. It is the longest river of India and largest and most fertile basin the country.
2. **Bhagirathi –** It is considered as source of river Ganga, rises at the foot of Gangotri glacier. The upper catchment of the river is glaciated and thus continuously feeds the river throughout the year. The river cuts spectacular gorges as it cuts through the granites and crystalline rocks of the middle Himalayas. Its main tributary is Bhilganga which joins it at Tehri, where the tehri dam has been constructed.
3. **Alaknanda –** The headwaters of the Alaknanda are formed by snowmelt from such peaks as Badrinath, Kamet, Satopant glaciers in Uttarakhand. Its meets the Bhagirathi river at Devprayag. Its main tributaries are Mandakini, Nandakini, and Pindar Rivers. The Alaknanda river drains part of chamoli, Tehri and Pauri districts. Pilgrimage centre Badrinath and natural spring Tapt Kund lie along the bank of the Alaknanda river .
4. **Ramganga –** tributary of ganga draining through the shivalik ranges and is fed by springs emanating from the reservoirs of underground water. Ramganga flows by the Corbett National Park near Ramnagar of Nainital district from where it descends upon the plains. Meets ganges near Kannauj Bareilly city of Uttar Pradesh is situated on its banks
5. **Gomti –** The Gomti originates from Gomat Taal which formally known as Fulhaar jheel, near Madho Tanda, Pilibhit, India. It extends 900 km (560 mi) through Uttar Pradesh and meets the Ganges River near Saidpur, Kaithi in Ghazipur. Another major tributary is the Sai River, which joins near Jaunpur. It meets Ganges near Ghazipur.
6. **Sai –** Tributary of Gomati which joins it in Jaunpur. Towns of Raiebareily and Pratapgarh are situated on it.
7. **Sharda –** Originates from the greater Himalayas at Kalapani at an altitude of 3600 mts. River is known as Kali river in Nepal where temple of goddess kali is situated in kalapani, near Lipulekh pass at the border of India and Tibet .and after descending into india it is called as sarda.
8. **Ghaghra –** It is a perennial river originating near Mansarovar lake, joins sharda river near brahmaghat UP. Ghaghra river joins Ganges at dariganj bhiar.It is largest tributary of ganges in terms of volume. The river flows through katarniaghat wildlife sanctuary, part of Dudhwa National Park. The upper course of river is famous for gangetic dolphins
9. **Saryu –** it is left bank tributary of Ghaghra, meets Ghaghra in bahraich district, Ayodhya is situated on the banks of river Saryu.
10. **Rapti –** Rises south of prominent E-W ridge midway between Dhaulagiri and mahabharat ranges in Nepal. Fed by springs. City of Gorakhpur lies on its banks and cause frequent floods in the rainy season.
11. **Varuna –** The Varuna River is a minor tributary of the Ganges River. It is named after the god Varuna. The name Varanasi itself is interpreted to be derived from the name of the river Varuna

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12. **Yamuna –** originates from yamunotri glacier in the lower Himalayas, uttarkashi distict of Uttarakhand. Flows for 1370 kms before it meets ganges at Allahabad. River is fed by Tons(in Uttarakhand) and Giri(HP) it forms boundary of Haryana ,passes through delhi along the border of UP passing through major cities like baghpat, noida , mathura , agra ,Firozabad, etawah , hamirpur. The industrial development all along the course of river is now the major cause of Yamuna being polluted so much.
13. **Sirsa –** Travels parallel to Yamuna river in S-E direction. Passes along the Etawah district.
14. **Sengar –** tributary of sirsa, moves along the bad land and ravines of Chambal valley.
15. **Chambal –** the river rises in the malwa on the northern slopes of vindhyan near Mhow. The river is part of the confluence of 5 rivers near etawah district called "Pachnada"(in hindi). The river is famous for the ravines that have been created due to flooding and break of channel by the Chambal river. Most rice and oil seed are grown along the banks. Chambal is liable to heavy floods due to step gradient of its bed before it debouches on the alluvial plains. The volume discharge is greater than Yamuna. Clear waters and alligators are common in the river. Hydropower and irrigation projects Gandhi Sagar (MP) and Ranapratap Sagar (Rajasthan) and Kota barrage build on Chambal river.
16. **Kuwari river –** A tributary of Chambal, rises from northern border of MP ,northern slopes of Vindhyas, moves in a semicircular tract before meeting Chambal in Auraiya District, though subject to sudden and freshets during rains yet remains an insignificant stream in the hot season.
17. **The Ahneya and Puraha** – These take rise in a series of lakes, the former near Kakan and the latter near Sauj in the Mainpuri district and little more than the drainage channels for carrying off superfluous rain water. In the hot or cold season they are normally dry but in rains, the Puraha, owing to its sinuous course, injures a considerable amount of land on either bank.
18. **Pandu** – It is the only stream of the Etawah district which flows into the Ganga. It rises in the extreme north-east of Bidhuna tahsil in a large clay depression forming a lake lying between Sabhad and Nurpur. It flows eastwards into the Farrukhabad district.
19. **Betwa** – the Betwa rises in the Vindhya Range just north of Hoshangabad in Madhya Pradesh and flows north-east through Madhya Pradesh and flow through Orchha to Uttar Pradesh. Matatila Dam, an undertaking between the states of Madhya Pradesh and Uttar Pradesh, Paricha Dam, Rajghat Dam situated on Betwa river. . The ambitious project Betwa–Ken link , estimated to cost over Rs.9000 crore, is expected to be included in the 12th Five-Year Plan was in recent news as of Min of Env. and Forest declined the required environmental clearanc**e.**
20. **Dhasan –** The **Dhasan River** is a right bank tributary of the Betwa River.
21. **Jawai river –** Flows through Bundelkhand region, acts as lifeline of this region due to variability in Monsoon over this region
22. Ken river – is one the major rivers of the Bundelkhand region of central India, and flows through two states, Madhya Pradesh and Uttar Pradesh. Rises from Vindhyas. It is a tributary of the Yamuna, The **Raneh** Falls on the Ken river and Ken Ghariyal Sanctuary are tourist attractions. **Gangau** Dam has been constructed at the confluence of the Ken and Simri rivers. The Ken River passes through **Panna National Park**. Banda city is located on banks of river Ken.
23. **Baghain River –** Also rises from Northern slope of Vindhyas and meets Ken river perpendicular making rectangular drainage.
24. **Tons River / Tamsa** – The Tamsa River (also known as the Tons River) is a tributary of the Ganges flowing through the Indian states of Madhya Pradesh and Uttar Pradesh. The Tamsa rises in a tank at Tamakund in the Kaimur Range at an elevation of 610 meters. It flows through the fertile districts of Satna and Rewa. The river receives the Belan in UP and joins

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