

## Geographical Personality of Paschimi Champaran District: A Study

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### Abstract

The geological or structural formation of a region prepares the background for the geographic landscape upto a great extent. It is covered with a thick layer of alluvium which extends to a variable extent but in unknown depth. Paschimi Champaran district presents an example of both the level plain and rising very slowly and gradually towards north Sumeshwar and Dunn Hills, the southern extension of the Shiwalik Mountain.

**Key Words:** Personality, Soil, Drainage, Climate, Temperature, Paschimi Champaran

### Introduction:

Paschimi Champaran district is the north-western district of the state of Bihar situating near Someshwar and Dunn hills of Shiwalik Himalaya. Paschimi Champaran district is a typical example of the influence of the Gandak and Burhi Gandak rivers along with their rivulets of the district, the alluvial soil and the usual monsoon rains make the track one of the most important productive centers of Bihar. It is the geographical aspect of history that prepares the physical and socio-economic personality of this region. In Vishnu and certain other Puranas (Choudhury, P.C.R.1960, p.1) frequent references have been made of champak aranya incating the forest of champatree stretching along the salgramior Narayani river which is another name of

Gandak. The area was the abode of Hindu ascetics, removed from the worldly ambitions. Thornton's Gazetteer (Choudhury, P.C.R.1960, p.2) did rightly emphasize on this point in his writings on the life and the culture of the people of Vajikanchal and Mithilanchal. It was as a result of this assured security on account of geographical features that traditions cloud grows unhampered and the literary pursuits in different directions continued unabated through the ages.

The geological or structural formation of a region prepares the background for the geographic landscape upto a great extent. It is covered with a thick layer of alluvium which extends to a variable extent but in unknown depth.

The average height of the range in the district is 1500 feet but the hills vary in altitude from a few hundred feet to 2884 feet above the sea level at fort Sumeshwar. Another hill in the district is Dunn hills of lower altitude range which extends about 20 miles in south-easterly direction from the north-west corner of the district and has average breadth of 4 to 5 miles. Barring the hills of the north and the area skirting them, the entire district is occupied by the rich and fertile plain.

Paschimi Champaran district presents an example of both the level plain and rising very slowly and gradually towards north Sumeshwar and Dunn Hills, the southern extension of the Shiwalik Mountain. The general appearance of the landscape is flat and gently sloping towards south direction. The general elevation of the plain is 60 meters above the sea level. The land slopes gently from north to south with a slight inclination eastward. The intervening slopes have lower gradients and are subject to annual floods. The rivers have deposited silt in their beds and as such generally flow at a higher elevation than the surrounding country. They burst through their levees and inundate their flood plains. The average gradient is less than one metre in five kms. Being a part of the Ganga etic Plain the study area is a homogeneous

plain.

The whole area is dotted with abandoned channels of the rivers forming oxbow lakes or elongated depressions.<sup>5</sup> Large tracts of fertile lands had been rendered useless for cultivation by deposits of thick sand brought in by Burhi Gandak river and its tributaries. The northern part of the district is an alluvial plain resembling in general features the adjoining districts. River Gandak had thrown off numerous offshoots, which traversed the whole district. These branches were continuously changing in number and position and the annual floods to which they gave rise rendered the greater part of the area almost uninhabitable. A number of canals have been constructed under the Gandak project which provides irrigational facilities to the district.

#### **Drainage System:**

The drainage system is the indicator of slope of a particular landscape. The drainage system of the district consists of a large number of Himalayan affluent. A Gandak and Burhi Gandak river overshadow the river system of the district and form the main river which counts and has ruled the economy of the district. They have mostly a direction from north to south with a slight eastward inclination. The larger of these rivers rise in the foothills of

Nepal and after a tortuous course passes through several districts and finally join to Ganga. The history of the floods of this district are the history of the Gandak and Burhi Gandak floods. Most of the other important rivers of the district join the Gandak and Burhi Gandak rivers. Other important river is Masan, Dhanauti, Ban Ganga, Kapan etc. The whole of this tract is drained by Gandak and Burhi Gandakie, Masan, Sikrahna, Ban Ganga, Khudi, Kismi, Kapan, Ramrekha, Raghia, Marhia rivers which take their origin from the northern mountain and flows toward south more or less, in right-angle or angular course towards south-eastern direction. During the rainy season, they are subject to violent floods and as the general slope of the district is towards south-east. The slope of the region is comparatively low toward south-east. They flow swiftly in flood season but in dry season they dwindle into trickling streams or lines of pools in the midst of its course. Drainage influences the land use of an area. Therefore, the study of drainage in this context is quite essential. These rivers are very useful from the agricultural point of view during times of scarcity of rainfall. During rainy season these rivers are so turbulent and swollen that they carry down with them enormous quantity of fine sand and gravel which are deposited

lower down. Their beds are thus, raised and become available for agricultural land use in other than rainy season.

#### **Climate:**

Monsoon climate occurs not only in the study region but also in the state and the country. The district has a humid climate except a dry summer. The climate of a region is the result of combination of a number of physical phenomena chief among them are temperature, rainfall, atmospheric pressure and the resulting winds, the space relationship of landmasses and the other physical parts of the district. These three seasons are the hot weather season (March to May), the rainy season (June to October), the cold weather season (November to February).

#### **The Hot Weather Season:**

As the sun starts moving towards north after March, 21, temperature starts rising gradually. The summer season begins with the month of March. With the rise of temperature, humidity and air pressure, the intensive heat of the region may be experienced particularly in the summer season. There are severe dry areas and land becomes too hot to walk during mid-noon. The highest maximum and minimum temperature of Paschimi Champaran district in the month of May, the hottest month of a year, are normally

45.37<sup>0</sup>c. There are two major characteristics of the summer season. (1) Thunder storm and (2) Dust raising winds. Thunderstorm occurs in the latter half of summer and in the monsoon season.

Loo is another characteristic of this season which is very hot and dusty and blows with a speed of 10 to 15 miles per hour. It affects human life badly. Loo is the hot surface wind that flows eastward through the Gangetic plain and with its advent temperature of the entire Gangetic plain rises rapidly. Sometimes hurricanes take place which is very harmful for the ordinary huts of the poor people.

#### **Rainy Season:**

The rainy season starts from June and ends with October but the amount of rainfall is not evenly distributed in all the months. The month of highest amount of rainfall is normally August when it averages about 333.09 mm. and the lowest is

4.69 mm. July follows August in bringing large amount of rain during which 302.62 mm. rainfall occurs. During the month of August, Paschimi Champaran district records 348.75 mm. The average annual rainfall in the district is 1852.85 mm. The rainfall generally increases from south-west toward to north-east. The rainfall generally increases from south-west monsoon from June to

September that constitutes about 84 per cent of the annual rainfall. In general, the rainiest month in the north-eastern part of the district is July while in the south western half is August.

#### **The cold Weather Season:**

Clear and cloudless sky, fine weather, low humidity and large diurnal range of temperature etc. are the specific characteristics of cold weather season in the region under study. With the beginning of November, all vestiges of the monsoon except high humidity and marked dew by night disappear from the weather. January is the coldest month and records the lowest temperature of the year. During January, the mean daily maximum temperature of Paschimi Champaran is 24.4<sup>0</sup>C and the lowest minimum temperature is 2.2<sup>0</sup>C. When the cold wind affects there in association with the passage of western disturbances across northern Indian in this season, the minimum temperature goes down to 2<sup>0</sup>C to 3<sup>0</sup>C above the freezing point. The days become warmer in March while the nights continue to be cool. Both day and night temperature begins to increase rapidly after the middle of March till May which is the hottest month. The cold season is from November to February and the summer season is from March to May. The south-west monsoon season is from June to

September, October being the transitional month. The cold season starts in November when temperature begins to drop fairly rapidly. Usually January is the coldest month, when the maximum temperature is recorded as 16.98<sup>0</sup>c. and the minimum temperature remains 5.64<sup>0</sup>c. During cold waves which affect the district in association with the passage of western disturbances across North India the minimum temperature may go down to 2<sup>0</sup>c or 3<sup>0</sup>c. From March,

temperature begins to rise steadily and the May is usually the hottest month. The highest temperature occurs in the region in the month of June which is 31.62<sup>0</sup>C and the lowest in January that is 16.24<sup>0</sup>C. The statistics of temperature is available that indicates the trend of temperature in the region. The following table shows the nature of maximum, minimum and average temperature in the district of Paschimi Champaran.

**Table- 1**

Dist.: Pas. Champaran

**CLIMATIC CHARACTERISTICS: TEMPERATURE (0<sup>0</sup>C)**

S.N.	Months	Max.	Min.	Ave.
1	January	16.98	5.64	11.31
2	February	19.52	9.34	14.43
3	March	28.34	16.43	22.39
4	April	33.69	21.57	27.63
5	May	45.37	28.97	37.17
6	June	41.61	26.31	33.96
7	July	34.16	25.58	29.87
8	August	32.58	26.12	29.35
9	September	31.86	27.89	29.88
10	October	31.26	23.18	27.22
11	November	28.17	14.61	21.39
12	December	18.66	5.69	12.18
	Total	362.20	231.33	296.77
	Average	30.18	19.28	24.73

Source—myweather2.com

The above mentioned table shows that the average of annual maximum temperature is 30.18<sup>0</sup>C while the average of annual minimum temperature is 19.28<sup>0</sup>C. The district of Paschimi Champaran experiences the average of maximum annual temperature as 30.18<sup>0</sup>c and average minimum annual temperature is 19.28<sup>0</sup>c while the average annual temperature is 24.73<sup>0</sup>c. May is the hottest month in the year after that temperature starts decreasing. Rainfall characteristics is also very striking. Thus, the annual average temperature of the district is 24.78<sup>0</sup>C. In the district, the month of May is the hottest month when the highest maximum temperature reaches to 45.37<sup>0</sup>C and the lowest maximum temperature

reaches to 16.98<sup>0</sup>C in the month of January. In the district, the month of May is the hottest month when the highest minimum temperature reaches to 28.97<sup>0</sup>C and the lowest minimum temperature reaches to 5.64<sup>0</sup>C in the month of January. The stations of rainfall are located in different parts of the study region and represent almost every corner of the region shows rainfall as unevenly distributed in the region. The following statistics regarding total annual rainfall in the district collected from the district headquarters show more or less similar to the data downloaded from internet. The following rainfall statistics shows that the region receives an average annual rainfall of 154.4 millimeter that is as follows:

**Table- 2**

Dist.: Pas. Champaran

**CLIMATIC CHARACTERISTICS: RAINFALL (mm.)**

S.N.	Months		Min.	Ave.
1	January	16.0	0.4	8.20
2	February	2.6	1.9	2.25
3	March	11.6	11.3	11.45
4	April	6.9	5.8	6.35
5	May	25.8	51.6	38.7
6	June	254.1	375.6	314.85
7	July	635.4	198.6	417.00

8	August	483.2	214.3	348.75
9	September	524.6	578.3	551.45
10	October	98.6	206.5	152.55
11	November	0.0	0.3	0.15
12	December	2.3	0.0	1.15
	Total	2061.1	1644.6	1852.85
	Average	171.76	137.05	154.40

After September both day and night temperatures begin to decrease slowly, the drop in night temperatures being comparatively more rapid. The average annual rainfall in the district is 1385 mm. The rainfall increases from south-west to

north-east. The rainfall in the south-west monsoon season from June to September constitutes 82 per cent of the annual rainfall. August is the month with the highest rainfall which is nearly a quarter of the annual rainfall. The details of the statistics are as follows:

**Table- 3**  
 Dist.: Pas. Champaran

**MEAN MONTHLY RAINFALL (MM).**

Months	VN	BGH	GNH	SKT	BTT	Total	Average
Jan	6.91	7.26	11.36	11.96	11.21	48.70	9.74
Feb	11.25	8.24	14.48	24.71	24.64	83.32	6.66
Mar	8.36	6.38	8.32	9.21	9.67	41.94	8.39
Apr	5.21	11.21	12.19	11.36	13.97	53.94	0.79
May	31.29	41.36	52.31	56.47	60.45	241.88	48.38
Jun	139.27	149.61	198.62	206.23	202.95	896.68	179.34
Jul	279.31	302.17	331.26	341.27	342.28	1596.29	319.26
Aug	289.97	274.63	319.02	349.63	357.12	1590.37	318.07
Sep	208.03	206.29	219.71	231.61	212.35	1077.99	215.60
Oct	39.21	47.26	62.42	71.16	81.34	301.39	60.28

Nov	18.73	12.45	6.05	9.15	16.24	62.62	12.52
Dec	2.09	4.31	5.12	6.17	8.57	26.26	5.25
Total	1039.63	1071.17	1240.86	1328.93	1340.79	6021.38	1204.28
Ave.	86.64	89.26	103.41	110.74	111.73	501.78	100.00

The table mentioned above shows the average rainfall of five centres i.e. Valmiki Nagar, Bagaha, Gaunaha, Sikta and Bettia. The total average of the district is 1204.28 mm. rainfall while the highest (1340 mm.) has been recorded in Bettiah centre next followed by Sikta (1328. 93 mm.), Gaunaha (1240. 86 mm.), Bagaha (1071. 17 mm.)

and Valmiki Nagar (1328.93 mm). Humidity also differs in different months and on the same pattern number of rainy days also differs in the different months. Possibly, the number of rainy days follows the magnitude of humidity in the district. The following table shows the condition of relative humidity in different months that is asfollows:

**Table- 4**  
 Dist. : Pas. Champaran  
**RELATIVE HUMIDITY AND RAINY DAYS**

S.N.	Month	RH (%)	No. of rainy days
1	January	74.24	
2	February	65.18	3
3	March	51.27	2
4	April	43.63	2
5	May	54.29	4
6	June	68.36	12
7	July	86.94	18
8	August	82.76	17
9	September	81.34	14
10	October	75.39	5
11	November	70.64	1
12	December	74.23	1
	Total	828.27	82
	Average	69.02	6.83

Source—District HQ. Bettiah, 2013 (Ave. of 2008-13)



The above mentioned table shows that the highest percentage (86.94%) of relative humidity is found in the month of July while the lowest percentage is found in the month of April i.e. 43.63%. The total number of rainy days in the district is 82 of which the maximum is found in the month of July (18 days next followed by August (17 days), September (14 days) and lastly by the month

of June) 12 days). The lowest number of rainy days is found in the months of November (1 days) and December (1 days) while each of March and April has 2 rainy days and each of January and February has 3 rainy days. The month of May has 4 rainy days and October has 5 rainy days. The seasonal distribution of rainfall also differs in various seasons as is shown in the following table:

**Table- 5**

Dist.: Pas. Champaran

**SEASONAL DISTRIBUTION OF RAINFALL**

S.N.	Block	C WS	HWS	WWS	Total
1	Sidhaw	49.35	570.93	0.00	620.28
2	Ramnagar	76.27	338.78	16.20	431.25
3	Gaunaha	79.69	311.53	0.00	391.22
4	Mainatanr	56.63	112.21	1352.21	1521.05
5	Narkatiaganj	48.62	333.93	10.96	393.51
6	Lauriya	85.64	203.54	0.00	289.18
7	Bagaha	71.61	349.24	46.83	467.68
8	Piprasi	65.38	160.22	0.00	225.6
9	Madhubani	85.61	140.55	0.00	226.16
10	Bhitaha	76.34	140.87	0.00	217.21
11	Thakraha	79.61	143.96	0.00	223.57
12	Jogapatti	45.68	76.54	1238.06	1360.28
13	Chanpatia	42.75	103.25	1336.25	1482.25
14	Sikta	54.23	92.32	1284.32	1430.87

15	Majhaulia	38.52	80.24	1120.36	1239.12
16	Bettia	42.62	87.65	1149.57	1279.84
17	Bairia	81.58	233.49	0.00	315.07
18	Nautan	38.57	75.68	1109.98	1224.23
	Dist. Ave.	62.15	197.50	481.37	741.02
	Percentage	8.39	26.65	64.96	100.00

Source—District HQ., Bettiah, 2013 (Ave. of 2008-13).

CWS--Cold Weather Season (Nov.- Feb.), HWS--Hot Weather Season (Mar.- May), WWS--Wet Weather Season (Jun-Oct.).

The above mentioned table shows the rainfall intensity in the different seasons and in the different blocks of the district. The total annual rainfall has been calculated as 1224.23 mm. In the district of which 8.39% (62.15mm) downpours in the cold weather season, 26.65% (197.50mm.) in the hot weather season and 64.96% (481.37mm) downpours in the wet weather season.

#### **Natural Vegetation:**

Vegetation of the district may be categorized into two divisions (a) Thick vegetation (b) Thin vegetation. The plain region of the district is full of small trees in scattered pattern. Due to intensive farming, the entire plain has been deforested except elsewhere apart of dry scrub jungle. In the rice fields which cover the low lying land the usual weeds of such localities are found. Throughout this track the mango, Peepal, Banyan, Imili, Bel, etc. are

found. In the northern Some shwar and Dunn hills thick vegetation is found. The groves of palms near villages are larger and bush is more plentiful which stretches from north to south. This zone consists of stunted trees of little height and it yields no timber of any size. But it is the main source from which the fuel supply of the district is derived and it is also rich in leaf products. This kind yields the ebony of commerce and is obtained from the Palas, Tassar silk worms feed on the Asantree, and the long course Sabai grass is made into a strong twin, perhaps however, the most useful of all trees which cloth the undulating slopes at their base known as Mahua. Which yield food, wine, oil, timber and affords the lower classes as ready means of subsistence in times of dearth the entire agricultural region or plain region has either scattered trees or without trees. This type of vegetation is known as thin

vegetation.

### **Soil:**

Soil is essential for agriculture. Agriculture cannot be imagined without existence of soil. It is the stage on which the agricultural activities play their different roles in many fold ways. Even the existence of human beings is possible only on soil layer neither in the air nor in the interior of the earth. There will be no doubt if the soil is considered as the raw material of agriculture. The three main categories of soils correspond roughly with the three physical divisions of the region. Soil of the region is of two major types:

- (a) Bhangar Soil (Older Alluvium) and
- (b) Khadar Soil (Newer Alluvium).

Three main types of soils are found in the district. These are:

1. Kewalor heavy clayey loam,
2. Dorasor mixed soil and
3. Balsundrior sandy or light loam.

The Kewal soil consists of hard stiff clay almost free from sand. It has the capacity to retain moisture and is suitable for Rabi cultivation as well. It is the characteristic soil of the flood affected areas. It contains large percentage of humus. The paddy and wheat are raised in it. The Bhangar soil is restricted to the higher surface of land which is subject to erosion by surface

drainage. Bhangar varies to a great extent in texture and chemical composition. But mostly it is loam with a fairly high clay factor. It is full of Kankar (carbonaceous concentration) in the region. Alternate layers of sand and clay is found here.

### **Industries:**

The study area is dominated by agricultural practices hence agro-based industries are found in the district. Sugar industries of the district were the dominant industries of the region which have already been closed except a few but small scale industries are running though such industries are suffering from several problems. Rice mills, flour mills, oil crushing mills, biri making etc. are running in the district.

### **Communication and**

### **Transport:**

Paschimi Champaran district is served by a network of roads, railways, and telecommunication. Rivers i.e. Gandak, Burhi Gandak and their tributaries have been affected greatly the means of transport and communication. After independence, however, a number of roads have been constructed. The towns and anchal head quarters have been connected by metalled roads, but the interior areas are still having un-metalled roads. The important roads of the district are NH- 24, 26, 32 and 35

which connects Bettiah to Mainantnr, Bagaha to Harmatanrvia Sidhwa, Bagaha to Chanpatiavia Luuria Nandangarh and Bettiah to Gaunaha respectively. The means of conveyance are truck, bus, auto-rickshaw bullock-cart, etc. A series of state highway has also been constructed. Besides, public roads were

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constructed and are maintained by the State Public Works Department, District Board and Notified Area Committees. The district has poor in rail communication. It is served by two branch lines of the North Eastern Railway. (i) Muzaffarpur-Bettiah Gounaha track and (ii) Raxaul- Sikta-Narkatiaganj – Bagaha section

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