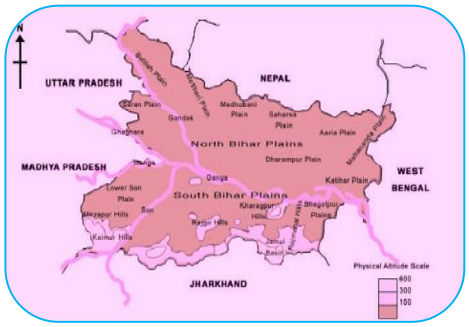
REVIEW OF RESEARCH

PHYSICAL ENVIRONMENT OF BIHAR

Dr. Anamika Kumari

+2 Teacher Raj High School, Darbhanga (Bihar).

ISSN: 2249-894X
IMPACT FACTOR : 5.7631(UIF)
UGC APPROVED JOURNAL NO. 48514
VOLUME - 8 | ISSUE - 8 | MAY - 2019



ABSTRACT:

Bihar is located in the eastern region of India between latitude 24⁰-20'-10" N To 27⁰-31'-15" N and longitude 83⁰-19'-50" E To 88⁰-17'-40" E It an entirely land- located state in a subtropical region of the temperate zone.

KEYWORDS: *temperate zone , eastern region of India.* meteorological characteristics.

INTRODUCTION :

Physical environment of any region is the sum total of the geological evolution, configuration of relief features, drainage networks. meteorological characteristics, vegetations and soils. And all the se combined together provide platform for the manifestation of social-cultural landscapes this is why the study of this physical environment is prerequisite for the analysis of the problems and prospects of development is Bihar.

GEOLOGICAL EVOLUTION

What Bihar is today, it has no been so from the very beginning of its evolution. Before partition of Bihar its geological history was more complex and complicated, but now, it geology seems to be the incident of yester year. However, it has been the theatre of human activities where many cultures came to intermingle with each other.

The present Bihar is a nascent physical reality. Its more than 88% geographical built up by loose unconsolidated sedimentary rocks. There is very small outlier of Siwalik Himalaya lying in its extreme north western along the northern boundary between Bihar and Nepal. Some fragmented patches of Dharwar and Vindhyan rocks have got its manifestation in the form of Rajgir hills, Gaya hills, Kharagpur hills and Kaimur hills Kaimur hills are composed of old sedimentary rocks, while as the remaining patches distributed over in the districts of south Bihar are composed of igneous metamorphosed and sedimentary metamorphosed rocks.

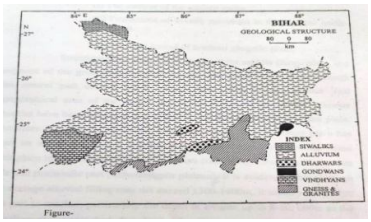


Figure-

From structural point of view Bihar can be divided into three following divisions

(i) The outliers of the ancient rocks.

(ii) Projections of Sivalik mountain in the extreme north west.

(iii) The vast spread of lowland gangetic plain.

Structurally the Bihar plain, a part of the middle Ganga plain, is a segment of the great Indo-Gangetic trough. The river Ganga flows through the central part of the region almost from west to east. About 2/3rd geographical

area of the region lies to the north of the Ganga. Various theories have been advanced regarding the genetically evolution of the plain. But there is a point of agreement among geologists that the entire plain has been an elongated shallow depression in which voluminous sedimentation took place by the actions of numerous rivers coming both from the Himalayan side and peninsular part (Chhotanagpur plateau).

It is indicated that the entire region of the middle Ganga plain has suffered great down warping due to the Himalayan upheaval. The based rocks seem to have faulted transversely at places and dislocations in the earths crust along such pre-existing faults or cracks cause earth[2] quake.

In the tip north-western part of the state a smaller formation known as the Shivaliks, is seen.

The present day Himalayas is the creation of three successive mountain building upheavals, which took place between Eocene period and Pleistocene period of the tertiary era. The abovementioned hilly tract lying in west Champaran district is the result of the second and 3rd upheavals caused by organic force. It is composed mainly of sandstones and conglomerates. As Shivalik projection is loosely built area, so it is extremely prone to fluvial erosion.

RELIEF FEATURES

Relief features are the manifestations of the undulating characteristics of the land surface. Mountains, hills, plateaus and plains are various forms of relief features of any region. Each feature has its own bearing on the socio-economic-cultural activities of the humanity.

The region can be divided into three distinct physiographic units. These are -

(i) Shivalik hills lying in the extreme north-west of the West Champaran
(ii) Gangetic plain
(iii) Outliers of the Chhotanagpur plateau.

The first physical division is hilly in nature. It is known as Shivalik range or the outer Himalaya. It is encircled by 500' contour lines and covers about 364 mile'. This hilly tract has two ranges intervened by longitudinal valley. These hills and valleys are extended from NW to SE parallel to the boundary between Nepal and India.

The most important physical part of Bihar is the gift of river Ganga and its tributaries. More then 78% Geographical area of Bihar come in the fold of the gangetic lowland plain. The river Ganga has divided this plain into two parts - the north Bihar plain and south Bihar plain. Though the process of evolution of both the parts is the same, but some differences are marked in its surface features. Its general characteristics can be described in the words of Prof. R.L. Singh', " Hemmed in between the foothills of the Shivalik and the Bhawar in the north and the peninsular upland in the extreme south, the region is almost a synonym of a homogeneous level, seemingly feature less plain from one and to the other and the monotony of relief never appears to lose until the hills are actually approached; in small topographic facets, however the plain is not without interest."

The northern plain of Bihar can be divided into four subdivisions.

(a) Tarai Part
(b) Bhabar Belt
(c) Bangar Plain
(d) Khadar Plain

Tarai region is situated just to the south of the foothills of Siwalik mountain in West Champaran and East Champaran districts. It is almost a region of sub-terrancan water pool. Its northern part is composed of coarse pebbles and boulders where rivers coming from north sink down there again to be reappeared further in the south. Causing the formation of many waterlogged pockets locally called "Chaurs". Actually most of the 'chaurs' are detached river channels. The Bangar is relatively upland in the perpetual extent of Khadar. Generally floodwater does not reach the Bangar area and floodwater easily spreads over the Khadar area. Geddes has done commendable work on the geomorphology of the middle Ganga plain. According to him the braced relief features of North Bihar plain like Saryupar plain are a series of alluvial cones formed by master stream along with the intercones or the intervening slopes between them. Generally and quite naturally the inter-cones have lower gradients than the

cones. In short, it can be said that the North Bihar plain is almost featureless alluvial composed low land area where the surface variations are all the manifestations of the drainage lines.

DRAINAGE SYSTEM OF BIHAR

The river Ganga is the heart line of Bihar. Numerous rivers emerging from the peninsular upland meet this trunk river in diagonally at different points. The son, the Karamnasa, the Phalgu, Karnauti, the Ojnala, the Khejure, the Chatar, the Jarso, the Tons, the Punpun, the Mohini, the Chandan etc. are important rivers draining south Bihar plain.

Among all rivers of South Bihar the son is the most important. It flows through an area having steeper gradient (35-55 cm per km.) with quick run-off and ephemeral regimes. It flows with roaring tributaries with the rain water in the catchments areas but turning quickly into formidable streams. These streams, being wide and shallow, become disconnected pools of water in the remaining part of the year. The channels of river son are very wide but its flood plain is narrow.

FLOODS & DROUGHTS

Floods and droughts are two extreme byproducts of the vagaries of monsoon. Flood has been a natural calamity since long time but its form has been made more menacing by undue interferences by us in managing river flows. As per report of Second Irrigation Commission about 1/5'of its total geographical area is liable to floods and equally the same area is prone to droughts. North Bihar is more prone to floods, while as, South Bihar except the Sone Command Area, is susceptible to droughts.

TABLE - 2.1

CHIEF RIVERS FLOOD PRONE AREAS OF BIHAR

Sl. No.	River's Name	Catchments area (Km^2)	Length of Rivers in Bihar (Km)	Flood Protection dams (Km)	Flood affected areas (Km)	Flood protected areas (Km)
1.	Ganga	15165	445	537.81	12920	4300
2.	Kosi	11410	260	797.90	10150	9300
3.	Burhi Gandak	9601	320	656.00	8210	4010
4.	Bagmati	9601	394	313.73	4440	3170
5.	Kamla Balam	4488	120	155.50	3700	2810
6.	Gandak	4188	260	456.04	3350	3350
7.	Ghagra	2995	83	125.00	2530	790
8.	Mahananda	6150	376	247.80	5150	1210
9.	Sone	15820	202	51.69	3700	210
10.	Punpun	7747	235	40.60	6130	260
11.	Chandan	2610	118	41.00	1130	80
12.	Kiul Haroha	12519	-	7.00	6340	-
13.	Badhwa	2215	130	-	1050	5
	Bihar	-	-	3430.60	68800	29490

In South Bihar the devastation of floods is relatively milder than North Bihar. Almost all rivers of South Bihar are ephemeral in character. However, during rainy season, they start to dance with over brimming water and cause floods in its catchments areas. The Sone, the Phalgu, the Kiul, Sakri, Morhar, Karmanasa, Mohane, Paimar, Panchane etc. are rivers, which remain in spate during the rainy season.

There are various factors, which are responsible for floods, and droughts, which will be discussed in chapters ahead. However, southwest part of Bihar is more prone to droughts. Aurangabad, Nawada, Gaya, Kaimur, Rohtas, Jahanabad, Lakhisarai etc. more drought-prone areas. In North Bihar Vaishali, Siwan, Saran, Samastipur and Muzaffarpur districts are more liable to droughts than other districts of North Bihar.

Many corrective measures have been taken to contain the intensities of floods and droughts by the successive governments. These have yielded results to some extent, but much more is needed to be done in this field. Without containing the menaces of floods and droughts prospect of agriculture cannot be brightened and without shining of agriculture, state cannot prosper.

CLIMATIC CHARACTERISTICS

Bihar covers about 2/3rd of the Middle Ganga Plain Region. It is a landlocked region lying between the lower Ganga plain and the upper Ganga plain. Hence it experiences monsoon climate of transitional nature.

As per the description of Miller' the middle gangetic plain has a somewhat continental interior location within the sub-tropical climatic belt, yet the monsoon regions supreme here and carries great weight in the overall human occupancy pattern and economic development. Keeping all points into consideration, it can be said that the monsoon of the land has the following characteristics -

1. Transitional nature of climate.
2. Erraticness of monsoon.
3. Minimum diurnal range of temperature.
4. Differentiated seasons.
5. Rains occur throughout the year in one part or other with wide fluctuating amount of rainfall.
6. Acute form of dryness in the summer season. 7. Frequent visits of cold waves and 'loo' during the winter and the summer seasons respectively.
8. The same climatic and agricultural rhythm everywhere.

In a predominantly agricultural state like Bihar, climatological factors leave a very important imprint on the economic condition of the people. Temperature, rainfall and amount of vapour in the atmosphere are the major determinants of the character and growth of the principal crops on the one hand and fate and future of the people on the other hand.

SOILS

The nature of soils is of primary importance for irrigation. The moisture-holding capacity of soil and its effective rooting depths are important criteria for determining irritability.

Bihar has a variety of soils, which differ region wise, as well as within the region itself. The state is divided into three physio-graphic regions, as mentioned in the preceding page. The parent materials, topography, age and vegetation of these three regions differ appreciably, with notable differences in climate, especially in the moisture regime. These differences have resulted in the formation of many soil types in the state.

The state can be divided into three major soil divisions the characteristics of which are as follows:-

1. Alluvium : North of the Ganga - The area on which these soils are distributed comprise Tirhut, Darbhanga and Bhagalpur divisions. Cao content varies from a very low percentage, about 0.5% to about 20 to 25 per cent. The north-western and central parts of this tract show highly calcareous zones. The soils analysed vary from clay loams to sand loams, and are neutral to somewhat alkaline in reaction : and where the content of CaCoz is high, the pH is above 8.0. The soil is rich in total as well as available potash, but appears to be deficient in phosphoric acid.

2. Alluvium : South of the Ganga - The soils of this category are somewhat heavier and finer in texture than those in the north of Ganga. Both available K2O and P2Os are higher. The CaCO3 content of the soils is lower than in the north. The soil reaction is almost neutral and becomes acidic towards the southern parts.

3. Soil Formed on Parent Rocks - The soils of this tract comprise parts of Rohtas, Monghyr, South Bhagalpur, the Santhal Parganas, Ranchi, Hazaribagh, Singhbhum and Dhanbad. They are characterized by a markedly acid reaction. The pH of the soils varies from 5.0 to 6.8. Another distinctive feature is the definitely high percentage of acid soluble Fe2O, compared with Al2O3. There is depletion of Cao, but not so much of potash.

On account of high water holding capacity, kewal soil is considered suitable for paddy and rabi crop. Pairu is generally black in colour and is very rich for growing sugarcane, paddy and wheat. It, however, requires timely irrigation. In Doras soil, rice, sugarcane and rabi crops are grown but it

depends on the level of land. In highland potatoes, vegetables, etc. are grown on doras soil. Balsundari soil is used for both bhadai and rabi crops but requires sufficient irrigation.

DISTRIBUTION OF TEMPERATURE

Temperature represents the degree of heat existing anywhere in the environment. Like moisture it is also an important factor for the sustenance of life on the earth or anywhere in the cosmos. The incidence of painfall and the availability of moisture in the atmosphere are cause spatial distribution of temperature. Fortunately Bihar is in commanding position in the spatial distribution of temperature. Except for few days months of the winter season it goes down up to 4°C, otherwise, the ai mean temperature varies from 24 °C to 27 °C. The maximum temperature varies between 40 °C and 48 °C and the minimum between 4°C and 9°C. May is the hottest month of the year with mean temperature shooting above 32 °C and Gaya or Nawada or its adjacent area is the hottest place with temperature rising up to 46 °C15. Thus the whole state does not suffer from temperature deficiency. This is why, it is said that Bihar is capable of harvesting varieties of crops belonging to different climatic conditions. This has happened because of the distribution of differentiated seasons throughout the year.

NATURAL VEGETATION

Vegetation is one of the rare bounties rendered by Nature to the humanity. It is an important component of the physical environment. powerful and capable of bestowing hells and heavens to us. Without it.

Natural vegetation of Bihar is deciduous in nature. Relatively high temperature and incidence of rainfall confined mainly to three to four months are responsible for deciduousness of our vegetation. Climate, soils and configuration of surfaces are important controlling factors for the growth of vegetation anywhere in the world.

The spatial distribution of natural vegetation in the state extremely uneven only about 5.20% of the total geographical area of the state is forested of total forested area (4,64,186 hectares) more than 72% forested area of the state lie in the districts of West Champaran, Gaya, Nawada, Rohtas and Banka. Alone West Champaran shares about 1/5th of the total forested area of the state. Bhojpur, Buxar, Saran, Siwan, Gopalganj, Sitamarhi, Sheohar, Muzaffarpur, Vaishali, Darbhanga, Samastipur, Madhubani, Saharsa, Madhepura, Supaul, Khagaria and Begusarai are such districts, which are bereft of natural vegetation. Araria, Kishanganj, Patna, Purnea, East Champaran and Bhagalpur districts have less than 1% forested area of its own total geographical area. From Table 2.5, the state of forest cover in the state becomes self-evident. If we want to protect our existence, then preservation and conservation of forests must be given foremost priority. Without losing time concerted and serious measures must be taken at the earliest to increase the acreage under forest cover. It is well-known fact that the state is basically an agrarian state and agriculture cannot sustain without preserving and enriching the forests of the land.

REFERENCES:

1.Narain, Hari, Airborne Magnetic Surveys Proceedings of Seminar on Earth Sciences, 1965, pp. 119-129.
2. Ibid.
3. Singh, R.L., India : A Regional Geography, NGST, Varanasi, 1968, p. 190.
4 Geddis, A.; The Alluvial Morphology of the Indo-Ban Transactions and Papers, Institute of British 1960, p. 262.
5. Bihar State Second Irrigation Commission, Govt. of Bihar, 1994.
6. Ibid.
7. Miller, A., Climatology. 8. Bose, S.R.: Ghosh, P.P. : Agro-Economic Survey of Bihar, Pilot Study, Patna, 1976, pp. 1-6.
9. Venugopalachar, B.V.: Elements of Irrigation, p. 47.
10. Dakshinamurti, C., Machael, A.M. and Srimohan Water Resources of India their utilisation in Agriculture, 1973, p. 135.