Chapter 3:

PHYSIOGRAPHIC BACKGROUND
OF BIRBHUM DISTRICT
CHAPTER III

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3.1 Location Shape, and General Boundaries:

Birbhum is the northern most district of Burdwan Division. It lies between 23°32'00"N to 24°35'00"N Latitude and 87°05'25"E to 88°01'40"E Longitude. The shape of the district looks like an isosceles triangle.

The peak is situated at the northern extreme end not far south of the point where the Ganges and the hills of the Santal Parganas of Bihar begins to diverge, while the river Ajay forms the base of this triangle. Birbhum district is bounded on the north and west by the Santal Paraganas, on the east by district of Murshidabad, and on the south by Burdwan, from which it is separated from Birbhum district by Ajay River. Thus only the southern boundary is a natural one. In early days when Santal Parganas was a part of Birbhum district, the western boundary was more natural and geographically the district comprised a complete natural region, extending over an area of 1,757.12 square miles (4550.94 Sq. Km).

3.2 Topography of Birbhum District:

Birbhum is a part of the Rarh region; the soil and landscape is very much similar to Rarh areas of Murshidabad, Burdwan, Bankura and Midnapur. The western portions comprising Khayarasole, Rajnagar, Dubrajpur, Suri, Mahammad Bazar and Rampurhat thanas are at the base of the heavily dissected plateau of Santhal Parganas projecting south - southeast, further east ward the projecting spurs become mere undulations. The high lands to the west are located on the hard nonporous crystalline rocks, while the rest is made up of the Gondwana sediments, the Tertiaries, the laterites and the alluvium. The Gondwanas and the Tertiaries, probably extend below the detrital laterites and the alluvium. These sedimentaries in their turn are underlain by basic lava flows some outcrops of which are found in the Nalhati thana. Through out almost the entire area of
the district the surface is broken by a series of undulations, the general trend of which is from north-west to south-east. Near the western boundary they rise into high ridges capped by laterites and are separated by valleys, a mile or more width. These ridges are actually spurs but appear like sea-cliffs. To the south east these upland ridges and their ramifications disappear gradually and the valleys become shallow, and gradually merge into the broad alluvial plains of the Gangetic delta.

The rapidity with which hillocks change to ridges, ridges to ramified undulations and undulations to level land varies notably. In the extreme north of the Rampurhat subdivision, the ridges are high and amount almost like hills. Being extensions of the low
Rajmahal hills these hillocks are of basaltic formation. They cease abruptly, and throughout the greater part of the Nalhati and Rampurhat thanas the surface, almost from the foot of the chotonagpur plateau is only slightly hummocky. In the Nalhati thana there are a few separate hillocks. The western portions of the Mahammad Bazar and Suri thanas are covered with high spurs extending many miles to the south-east but where as in the northern part of this they are succeeded at once by evenly level ground, on the south of the valley of the Mayurakshi they sink into undulations and after nearly vanishing, rise again to a measurable extent of low hillocks. The ridges on the south bank of the Mayurakshi passes into flat country east of Suri, but swell into well-raised uplands near Sainthia. Further east, the undulations extend beyond the railway line some miles east of Labhpur, and even south of Bolpur, where the railway line runs through a deep cutting the of laterite rocks. The Tertiary and Pleistocene deposits are mostly covered by

HYDROLOGICAL MAP OF BIRBHUM DISTRICT

![Hydrological Map of Birbhum District](image)

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SOURCE: National Atlas and Thematic mapping Organization

Fig.: 3.2
a variable thickness of laterite which even envelopes some portions of the peneplained and highly weathered gneissic terrain to the west. Along the north of the Ajay, to the south of Labhpur and Bolpur, the land is totally flat. The hollows between the ridges form natural drainage channels, out of which the wider valleys are streams of considerable volume and in a few cases expand into broad rivers, which even within Birbhum have a small and shallow current throughout the greater part of the year. To the north of 20°20' N, in the Murari thana the land slopes north - northeast as is evident from the flow of the Pagla Nadi and its tributary the Suri nadi.

The highest point in Murari is only 232 feet at Dhuria Pahar, the site of Rajgan stone works (24°33' N & 87°49'E). In Nalhati the highest point is 263 feet (24°19' N and 87°47'E) near the state border. The general slope of the Rampurhat thana is from west to east dominated by east flowing left bank tributaries of the Dwaraka. The slope of Mayureswar thana above 24°N, latitude is northerly and South of it easternly. These two different slope directions begin from the Mahammad Bazar thana where the Dwaraka takes a north easterly bend and the Mayurakshi throws off a distributary, the Manikarnika.

To the south, the Ajoy dominates the landscape with its shoals and sandy bed - miles wide at places. The Ajoy enters the district at about 300 feet (87°08'E & 23°46'N') and leaves at 75 feet (87°57'30"E & 23°37'30"N).

The rolling upland topography in between Mayurakshi and the Ajay is known for its splendour and picturesque variety. The general gradient is from north-west to south east. However, the Sal which downstream is known as the Kopai river flows from north-north west to east-southeast and after crossing the 250ft contour line, flows west-north west to east-southeast. The Bakreswar and The Chandrabhagha nalas describe similar courses after crossing the 200ft contour line. It is interesting that the Andal - Sainthia chord line runs along the tract where this change in the direction of slop occurs. The Mayurakshi shows a perennial channel only after it descends below the 200ft contour line but becomes dry again between 87°45'E and 87°55'E. The Kopai meanders in a semi - circle from west-north-west to east-south-east and finally to north-east from 23°41'N and
From this point the right bank tributaries of the Kopai display severe scars of gully erosion. This has formed in the badland topography to the north of Binuria, Sri Niketan, Surul, Santiniketan and Makarampur. Noticeably, the badland topography in this part does not extend below the 150 feet contour and the banks of the Kopai itself is free from the damages of gully erosion.

In between the Ahmadpur - Katwa Railway line below Labhpur and the Bakreswar, there has been extensive gully erosion by tributaries of the Bakreswar, very similar to those found above Santiniketan. The combined streams of the Bakraswar and the Kopai is called the Koiya nala. The Koiya is perennial, whereas the Mayurakshi though a larger stream is non-perennial in the same longitudinal belt. The distributaries of the Mayurakshi take off from the left bank and flow parallel to the mother stream in Birbhum district. The Koiya gives off a distributary, the Kandar Nala from its right bank. It flows parallel to the Koiya and joins it again through the swamps near the district border.

3.3 Drainage System of Birbhum District:

Most of the rivers and rivulets arise out of Chotanagpur hills, enter into the western portion and pass through the eastern portion of the district. The river, Ajay divides the district Burdwan and Birbhum. The rivers, Mayurakshi, Hingla, Bansloi, Kopai, Bakraswar, Siddheswari, Brahmani, Dwarka etc; pass through the different blocks of the district. The gaps between the two ridges from natural drainage channels, which in the wider valleys are streams, considerable volume in a few cases expand into broad rivers, which even within this district have a small and shallow currents throughout the greater parts of years. Out of the rivers and streams by which the district is drained are two rivers namely, the Mayurakshi and the Ajay are of considerable magnitude. Both the river valleys are of notable size, their width varying from the two hundred yards to half a mile. During the winter and summer months their beds are broad expanses of sand with narrow streams trickling down in meanders, but during the rainy season the water channels grow much broader and deeper often causing devastation in the adjoining areas. Between these two rivers there are many drainage channels known by the generic name of the kandar. 130 number of rivulets have so far been identified in this district.

In the northern part of the district there are several swamps, most important of them being Pahankuri and Rajchandrapur 'beel'. Several marshes are also found along the
right bank of the River Mayurakshi. All of them are connected with the master stream by spill channels. Many derelict channels forming linear or ox-bow lakes are found on the

**DRAINAGE NETWORK OF BIRBHUM DISTRICT**

![DRAINAGE NETWORK OF BIRBHUM DISTRICT](image)

The Ajay with source in the Chhotanagpur hills of Jharkhand first touches the district at its south-west corner, and follows a winding course in an easterly direction, forming the district boundary. After receiving the Kunur nala from the right bank and
Plate No. 3.1
One of the common transport system in village Galaichandi.

Plate No. 3.2
River Kopai an important river of Birbhum District.

Plate No. 3.3
River Hinglo, the source of irrigation in village Bhangaband.

Plate No. 3.4
The red-soiled road serves as river bandh and also connects Bagsina and Thiba.
taking a north easterly bend north of Mangalkot (in Burdwan) at extreme south eastern angle of Birbhum, it enters Burdwan eventually falling into the Bhagirathi near katwa. The total length of the Ajay in this district is about 121.6 km.

The Mayurakshi enters Birbhum from the Santal Parganas a little north of the village of Haripur Jambandi at a height of 228 feet and flows through the centre of the district from west to east, Passing two miles north of Suri and forming the southern boundary of the Rampurhat subdivision. It leaves the district at an altitude of 99 feet, a little east of Ganutia (87°50'E & 23°52'30"N) and joins the Dwaraka, which is itself tributary of the Bhagirathi.

The river Hingla coming from the Santal Paragana enters Khayrasol thana some 12.87 km north of the Ajay, and gradually approaching that river, unites with it at Chapla in Dubrajpur thana, after a course in Birbhum of about 24.14 kms. The greater part of this tract is drained by series of small streams, which rise within the district, and gradually come together from the numerous vales, the country is here longitudinally divided. Then it falls into the Bakraswar. The latter rises from south of Rajnagar a few kms north-west of the hot springs of the same name (87°22'30"E and 23°52'50"N) some 16.1 kms west of Suri, and after following a zigzag course east-wards, and getting one by one the waters of almost all the rivulets of south Birbhum, joins the Mayurakshi as the Koiya Nala a few miles beyond the eastern boundary of the district. The Bakreswar and the Kopai meet at a height of 92 feet below Labhpur.

The Brahmani is a river of the same type as the Mayurakshi but on a smaller scale. It enters the district at Narayanpur (24°15'20" N & 87°38'25" E), dissects the Rampurhat subdivision, and passing under the railway 3.22 Kms south of Nalhati falls into the Dwaraka in the Murshidabad district.

The Tripita Nala flows east from the Santal Parganas, enters the district at 87°44'E & 24°17'30"N, becomes perennial 87°45'E and joins the Brahmani as left bank tributary at 87°50'E and 24°17'N.

The Bansloi in the north of Rampurhat subdivision and the more slow moving Pagla between the Bansloi and Brahmani, are smaller rivers of the same kind as the Mayurakshi. The Bansloi coming from the west as a broad and perennial stream flows 3.22 Kms north of Muraroi Police station, and falls into the Bhagirathi opposite Jangipur in the district of Murshidabad.
The Dwaraka is a narrow, non-Perennial stream originating from the Ramgarh hills of the Chotanagpur Plateau, the Dwaraka describes the district boundary from $87^0.30'$ E and $24^0.7'$ N for a few Kms flowing southeast.

Inspite of these rivers, there are other streams such as Gharmora, Chila, Kulia, Ghagar etc.

3.4 Soils of Birbhum District:

The soil type of the area, mostly neighbouring the Santal pargana district is almost lateritic interspersed with exposed granite veins at places, high medium texture top soil with undulated topography. The old alluvial is also found along with the layer of clay.
gravel, sand and ghuting. The water holding capacity is very poor. The pH ranges from 4 to 6.5.

The predominant soil types are of old alluvial and Red laterite. The alluvium soils are mostly of medium texture, medium inorganic matter, Phosphate and medium or high level Potash is available. The pH of the soil is acidic in nature, varies from 5.0 to 6.5. The Red and laterite soil are light textured, porous, graveled, with poor inorganic matter, including phosphate and bases. The pH of this soil is acidic in nature varying from 4.8 to 6.0.

3.5 Climate of Birbhum District:

The climate of this district is characterised by an heavy hot summer, high humidity and well distributed rainfall during the monsoon. The cold weather from about the middle of November to the end of February is followed by summer from March to May. The south west monsoon lasts from June to September, October and the first half of November makeup the post monsoon season. The average annual rainfall in the district is 51.33 inch (1,303.7 mm). The rainfall during the monsoon months of June to September is about 78 percent of the annual rainfall. The rainfall in the district in general decreases from the north west towards the south-west.

Temperature begins to rise rapidly from about the beginning of March. May is the hottest month with the mean daily maximum temperature of 39.7°C and the mean daily minimum of 26.3°C. The heat in summer is over bearing.

The maximum temperature during the period of April to the early part of June, sometimes rises it 45°C to 46°C. There is a welcome relief from the heat, though temporarily, when thunder showers occur on some days in this season. With the advance of the south west monsoon into the district early in June, the day temperatures drop considerably but the night temperature remain nearly as high as in the summer months. Due to the continuing high night temperatures, with the increased humidity in the air, the weather during the monsoon season is often uncomfortable in between the rains, with the withdrawal of the monsoon by about the first weak of October, the temperatures begin to drop.

This drop, particularly in the night temperatures is more rapid, from about the middle of November. January is the coldest month with mean daily maximum temperature of 25.4°C and the mean daily minimum of 12.9°C.
In association with passing western disturbances spells of colder weather are experienced in the winter season. The minimum temperature may then occasionally go down to about 6°C or 7°C.

The air is highly humid throughout the south-west monsoon season. Thereafter the relative humidity decreases gradually. The driest part of the year is the summer season, with an average relative humidity of about 45 Percent in the mornings and about 20 Percent to 25 Percent in the afternoons. Later the relative humidity increases with the progress of the season.

Storms and depressions from the Bay of Bengal, in May and the post monsoon season, often reach the district and its neighbourhood and causes widespread heavy rain with high winds. Depressions in the monsoon season also affect the district and heavy
rains occur. During the hot season thunderstorms occur mostly in the afternoons, along with them are heavy rains, occasional hail & severe squalls. These thunderstorms called “norwesters” are locally known as kalbaisakhi and the squalls associated with them usually come from the north west. A sharp drop in temperature is experienced during these storms. Rain during the monsoon season is also often combined with thunders. Fogs occur sometimes during the winter.

3.6 Natural Vegetation of Birbhum District:

The vegetation of Birbhum District as a whole belongs to the tropical dry deciduous type with a few representatives of the ever greens occurring here and there.

Botanically, the district can broadly be divided into two zones. The first zone comprises the undulated high lands along the western part of the district. Although the soil erosion is acute in this lateritic area, several relict patches of chotanagpur plateau forest are still to be found around Rajnagar, Mahammad Bazar, Hetempur and Suri. The vegetation of this region shows semi-arid nature and is similar to eastern Bihar. Species of scrubby thickets like Acacia Bridelia, Buchanania, Calotropis, Capparis cassia, feronia, jatropha, phyllanthus, streelus, Tephrosia, wendlandia, Zizy plus etc. Other plants of the laterite soil are common. Grooves of trees are rather scarce in the south western parts of the district. The second zone consists of the flat alluvial plain in the south and east of the district. The vegetation of this tract is characteristic of the alluvial rice plain of Gangetic West Bengal. Species of Ageratum Alysicarpus, Apongeton, Cayratia commelina etc. flourish well in this part of the district.

The common plants seen around the dwellings in village and towns are clumps of babla (Acacia nilotica), bel (Aegle marmelos), ata (Annona squamosa), kanthal (Artocarpur heterophyllus), neem (Azadirachta indica), bansh (Bambusae arundinacea), bot (Ficus benghalensis), pakur or aswatha (Ficus religiosa), am (Mangifera-indica), sajina (Moringa oleifera), amra (Spondias pinnata), jam (Syzygium cumini), tentul (Tamarindus indica), arjun (Terminalia arjuna) and other arborescent species.

Margins of tanks, bunds of paddy fields and marshes are inhabited by a mixed community of aquatic and amphibious species: kachuri pana (Eichhornia crassipes), jhanjhi (Hydrilla verticillata), kalmi (Ipomoea aquatica), susni (Marsilea minuta), paniphal (Trapa natens) etc.
Plate No. : 3.5
River Mayurakshi, the Main River of Birbhum District.

Plate No. 3.6(a)
Natural Vegetation of Birbhum District (Mango and Neem).

Plate No. 3.6(b)
Natural Vegetation of Birbhum District (Papaya and Palm tree).

Plate No. 3.6(c)
Natural Vegetation of Birbhum District (Coconut).
Apart from the principal types of food and cash crops - rice, wheat, maize, potato, sugarcane, jute, pulses, oil seeds and vegetables - the Birbhum district also produces several other important economic plants.

The district is particularly rich in medicinal plants. Some common ones, which are used as natural drugs and form articles of trade are vasaka (Adhatoda Vasica) kalmegh (Andrographis paniculata), satamul (Asparagus racemosus), anantamul (Hemideomus indicus), siuls (Nyotanthes arbor-tristis), tentul (Tamarindus indica) arjun (Terminalia arjuna), behera (Terminalia bellerica), haritaki (Terminalia chebula) etc. The majority of these drugs come from the forests.

The trees of babla (Acacia nilotica), palas (Butea monosperma), bot (Ficus benghalensis), aswatha (Ficus religiosa), kusum (Schleichera oleosa) and kul (Zizyphus mauritiana) are raised for tiny lac insects to leave resinous incrustation on their soft branches. The tunt (Morus-alba) is commonly cultivated in Bhadrapur, Boswa Bishnupur, Ganutia and their neighbouring areas to feed silk-worms. Several species of sisal (Agave spp.) are grown on large scale near Rajnagar.

The forest are usually distributed in scattered patches, in between the stretches of barren waste lands or fallow fields along the western fringe of the district. They are located in Nalhati, Rampurhat, Mahammad bazar, Suri, Rajnagar, Khayrasole, Dubrajpur, Illambazar and Bolpur Police stations. The forest may be classified as lateritic forests, which include, sal forest.

With the introduction of permanent settlement, forest were gradually cut to bring land under cultivation. The practice of keeping land fallow and unscientific land management led to severe erosion.

The biggest area of forest that has been left is Chaupahari jungle having an area of about 14 sq.km. under the Illambazar police station. Other notable spots are Baidyanathpur, Kachujore, Asansol, Rajnagar jungles and their adjoining formations. The district is divided into five forest Ranges, as follows: Bolpur, Suri, Rajnagar, Mahammad Bazar and Rampurhat. Some minor forest products like bidi leaves, sal leaves, mahua flowers, pial fruits, grasses and fodder provide means of livelihood to the people in the forest areas.
References:

Aragatir Pathe Birbhum, (March 2008), Birbhum Zilla Parisad, Suri Birbhum
Annual plan on agriculture 1985-86. Birbhum.- Principal agriculture officer Birbhum, Suri Birbhum.
Agricultural marketing in Birbhum district annual review (1986) District agricultural marketing Officer, Suri Birbhum.