CHAPTER - II
GEOGRAPHICAL BACKGROUND OF WEST BENGAL

ORIGIN OF THE THE TERM "BANGLA"

Eastern plain of the Indian subcontinent flourished by the sediments of Ganga-Brahmaputra-Meghna river system was formerly known as 'Bengal' in the British period. But the British Indian province, Bengal or popularly known as Bangla is a foreign corruption of the name 'Vangala'. The term 'Vangala' is phonetically similar to Vanga.1

The extent of Vanga as a country or a geographical, cultural or political unit has been changed from time to time but the exact derivation of the term Vanga is yet unknown. The Vangas as a tribal people are mentioned in the Aitareya Aranyaka2. The earliest reference to Vanga as denoting a territorial unit is found in the Arthasastra of Kautilya. This term has been found in the Purānas, the Mahabharata3, the Ramayana,4 Buddhist texts, Mahabhasya5 of Patajali and other literary text but none of the text gave the idea regarding the geographical denotation of the term Vanga.6 The Mahaniddesa7 of 2nd century A.D. and Milindapanha8 of 1st century A.D. and other epigraphic evidences suggest that Vanga included at least parts of coastal area of West Bengal as maritime routes touches Tamralipta, the famous international sea port of ancient eastern India is at present, a part of east Medinipur district, possibly included in ancient 'Vanga' along with parts of present Dacca, Faridpur and Buckergunge districts of present Bangladesh.

The term 'Vangâla' (which was connected with Vanga) is often referred in the works of the latter period after 8th century A.D. Both the terms, Vanga and Vangala were using simultaneously at least upto the 10th century A.D. (Map No. 1) The earliest epigraphic reference of Vangala is found in the Nesari plate inscription9 of Govinda III, dated 805 A.D. and then in the Tirumalai rock inscription10 of Rajendra Chola, dated 11th century A.D. both the terms, Vanga and Vangala, have been separately mentioned in the Ablur inscription of 12th century A.D. and by the Hammiramahakâvya of Nayacandra Suri (15th century A.D.) and according to that text Vanga and Vangala had separate geographical entities.11 On this term, Abul Fazl in Ain-i-Akbari12 says "The original name of Bengal was Bang".

The lower part of the area (Bengal) was inhabited by the people of Gangaridae as indicated by the author of Periplus of the Erythraean Sea
(sec. 63) in circa 80 A.D. and by Ptolemy. Ptolemy in Geographike Huphegesis (VII, I, 81) of 2nd century A.D. suggests that "all the country about the mouths of Ganga is occupied by the Gangaridai". This suggests that Gangaridai country stretched a long way along the coast now in West Bengal and Bangladesh. The term 'Gangaridai' is linguistically related to the word Gangahrida meaning "(the land) which has Ganges at its heart". The Raghuvâ½a of Kâlidâsa (IV, 36) of 5th century A.D. also shows beyond doubt that during 4th-5th century A.D. Vanga inhabited the deltaic region of southern Bengal and there were no other than the Gangaridae or Gangians who lived in the regions about the mouths of the Ganges.

Ancient Bengal during the Hindu empire in Bengal, rather it may say, before the Muslim conquest in Bengal in the beginning of 13th century A.D., the different parts of the region were known as Banga, Poundra, Barandra, Rahra, Gour, Samatat, Horical etc. In the time of Muslim empire in Bengal, Sams-uddin Illias Saha conquered the lands and entire province named as Vangala. During the Muslim invasion, the term Vâgâla was pronounced as 'Bangâla (h)' by the Muslim sultans for the first time. They pronounced the final 'a' in the last consonant of Sanskritic words in North Indian dialects. The earlier pronunciation of Vâgâla, as is well known as Vagâla, which was naturally transliterated by the Muslims in their script as Bangâlah (pronouncing Bangala). This Muslim pronunciation of the name is directly responsible for the name Bangâla. The Subah of Bengâla during the Mughal emperor Akbar 1576 A.D. denoted the entire territory from Sylet to Kankjl excluding of Chittagong, Cooch Behar, Medinipur and Hijli Bull. At the end of Aurngzeb's reign Hijli, Medinipur, Jaleshwar, part of Chotonagpur and Sundarban were included in Subah Bangala.

The local Hindu Kings and Baro-Bhuyan landlords controlled the region until the beginning of British rule in the 18th century. In 1757 A.D. in the battle of Palasey put an end to the Muslim rule and modern Bengal's history began with the advent of the European and English trading companies. From 1858, Bengal was directly ruled by the British government. Imitating the name given by Mughals, the Portuguese first named 'Bangâla (h)' as 'Bengla'. The British simplified it into 'Bengal'. Due to different political reasons, the territory of Bengal has been reduced by the British government in different times. Until 1874, Bengal consists of Assam, Bengal, Orissa, and Chotonagpur. Later Assam was separated from Bengal. In 1905, Bengal was divided by the British rulers for an administrative purpose into an overwhelmingly Hindu west (including present day Bihar and Orissa) and a predominating Muslim east (including Assam) but owing to strong Hindu agitation, the British reunited East and West Bengal in 1912 and made Bihar and Orissa a separate province. In 1947, Bengal again split into the state of West Bengal of secular India and a Muslim region of East Bengal.
under Pakistan. East Bengal later came to be known as East Pakistan in 1958 but in 1971, after a war of independence against the Pakistan army, East Bengal became independent Republic of Bangladesh, literally "Land of Bengal". The western part of Bengal, now the state of West Bengal remains a part of India. The end of British imperialism saw a divided Bangal in 1947. Though now divided into the independent nation of Bangladesh (East Bengal) and the Indian state of West Bengal it is linguistically and to a great extent culturally a fair homogeneous unit.

In present research work, we have taken into consideration the western part of undivided Bengal that is the present Indian province 'West Bengal' (Map ). Though there are numerous crafts in Bangladesh, but they are technically and traditionally almost the same in nature. Only the traditional crafts now present in West Bengal and which have a strong marketing prosperity in present day have been incorporated within this research work.

GEOGRAPHY OF WEST BENGAL

West Bengal is geographically very much flourished landscape in India. It covers a vast region in the eastern India, stretching from the Himalayan Mountainous range in the North to the Bay of Bengal in the South. The province covers 88752 sq. km. land area and situated between 21°30’ north to 27°30’ North latitude and 85°50’ east to 89°45’ East longitude. The tropic of cancer (23°30’ N) across the districts Nadia, Bardhaman, Bankura and Purulia of the province. (Map No. 4) In that sense, the geography of the state is unique. On the other hand politically ancient Bengal was the site of several major janapadas. It was also part of large empires such as the Maurya Empire and Gupta Empire and part of the regional Pala Empire and Sena dynasty. From the very beginning of 13th century, the region was controlled by the Bengal Sultanate, Hindu Kings and Baro Bhuyan landlords until the beginning of British rule in 18th century (1757 AD). So, the Political Border of Bengal has been changed in different time. In my present thesis I have taken the Indian province 'West Bengal' which is the western part of the large region (excluding Bangladesh). It is on the eastern bottleneck of India. The province is surrounded by three neighbouring country like Bangladesh, Nepal and Bhutan. On the other hand West Bengal shares border line with the Indian states Sikkim, Assam, Bihar, Jharkhand and Orissa. There are 20 districts in the province, viz. Darjeeling, Jalpaiguri, Alipurduar, Cooch Behar, North Dinajpur, South Dinajpur, Maldah, Murshidabad, Birbhum, Bankura, Bardhaman, Purulia, Hooghly, Howrah, West Medinipur, East Medinipur, Nadia, North 24 Parganas, South 24 Parganas, and Kolkata. The shape of West Bengal is long, narrow elongated and irregular as it emerged after partition during independence. The great historical, commercial as well as industrial city Kolkata is the State
Headquarter. The Darjeeling Himalayan Hill region in the northern extreme of the state belongs to the eastern Himalaya. The narrow Tarai region separates this region from the North Bengal plains, which is in turn a transition into the Gangetic Delta towards the south. The Rarh region intervenes between the Gangetic delta in the east and the western plateau and high lands. A small coastal region is on the extreme south, which the Sundarbans mangrove forests form a geographical landmark at the river Ganges delta. The southern plains of the state are criss-crossed with a network of rivers, the major ones being Bhagirathi and its tributaries. The Ganges is the main river which divided in West Bengal. Main branch enters in Bangladesh as the Padma, while the other flows through West Bengal as Bhagirathi and Hooghly River. The Tista, Torsa, Jaldhaka and Mahananda rivers are in the northern hilly region. The western plateau region has rivers such as the Damodar, Ajay, Kangsabati and Roopnarayan. The Ganges delta and Sundarbans area have numerous rivers and creeks.

**PHYSIOGRAPHY**

Eastern Indian basis is the part of the great Indian shield which disappears under the alluvium. The Ganga-Brahmaputra river system forms the world’s largest delta known as the Bengal Basin which covers most parts of West Bengal and Bangladesh. A thick cover of quaternary alluvium of Ganga-Brahmaputra and their tributaries conceals beneath it almost all the older rocks of Bengal Basin (both West Bengal and Bangladesh). The entire Bengal (both West Bengal and Bangladesh) basin is the part of the great Indian shield, approximately to the east of longitude 87°E, disappears under the alluvium. But West Bengal depicts a unique landscape comprising varied land forms from Himalayan Mountains on the north to open seafront on the south and the stable Indian shield skirts the western fringe of the state. The rest consists of vast stretch of alluvial plains. In the west, there are a number of in-tracratonic Gandwana basins along with the Damodar valley, a few exposures of early Tertiary period near Baripada (in Orissa) and Durgapur and the late Mesozoic volcanic of the Rajmahal hills. It is only in the Shillong plateau of Meghalaya, which faces the Garo-Rajmahal gap through which the Ganga and its tributaries flow into the sea and the Archean and Pre-cambrian shield crops out again. The characteristic features of physiography of West Bengal are its rivers, many of which with their tectonic activities made history of the region, constant sifting of river beds particularly in alluvial soil has continuously transfigures the details of face of Bengal in historic times. A considerable portion of West Bengal has been made up by the silt carried down by the river Ganga.

West Bengal is physiographically a flourished landscape in India. The present land formations of West Bengal have been developed throughout
the gradual infilling of the basins and the resultant landforms varied according to the local circumstances and the geomorphic process. West Bengal is essentially a flat featureless alluvial plains and a large portion of it, being a part of delta of river Ganga. Very small percentage of area in the north is really mountainous. The state exhibits three major geographical units viz. (Map No. -3)

A) The Northern Mountainous Region.
B) The Alluvial Plains.
C) The Western Semi Plateau Region.

A) NORTHERN MOUNTAINOUS REGION

As an important part of Eastern Himalayan region the Northern Mountainous Region occupies mainly the northern portion of West Bengal. The mountains and hills lie on the extreme northern boundary like the crown of West Bengal. This mountainous region is known as the Darjeeling Himalaya which is also part of Darjeeling-Sikkim-Bhutan Himalaya. The region lies between 26°55' and 27°3' north latitude and 87°59' and 89°52' east longitude approximately. This geographical unit of the present study comprises of the entire Darjeeling District except the Siliguri Sub Division and extreme northern narrow track of Jalpaiguri District towards the Bhutan Border. Darjeeling Kurseong and Kalimpong Sub Division and Boxa area of Jalpaiguri forms the mountainous trace of the region which is almost 300 to 12000 feet high above the seal level. The 300 feet contour line limits the southern part of this region. Tarai plains lies at the foothills. The entire area comprises of mass of mountainous spurs. Deep slopy mountainous ridge and ravine are the main characteristic of the region and the entire area is produced by igneous and sedimentary rocks. The river Tista divided the region into two parts. One is Darjeeling hill territory or the western bank and the other is the eastern bank of the river Tista. 

To the Nepal-Sikkim border the third highest peak of the world, Kanchanjunga (28,146 feet) is situated. The Singalila range stretches southward from Kanchanjanga and commands the Nepal-Sikkim and Nepal West Bengal border. Regarding the backbone of the Darjeeling Himalaya it is extended upto Tanglu and Senchal. The highest peaks of the ridge are Sandakphu (11,929 feet), Phalut (11,811 feet), Sabargram, Tangen, Manibhanjan, Senchal etc. among which Sandakphu is the highest peak in West Bengal. There are four giant hill range to the south-east of the Singalila range, locate in order from north-west to south-east ward are the Ghum range (7372 feet), The Senchal Mahaldiram range (8000-8600 feet), The Kakadah or Tanglau range (7300-680 feet) and The Darjeeling-Jalpaiguri range (7886 to 7002 feet).
Eastern hilly tract of the river Tista bears a different characteristic feature than the western side. Due to heavy rainfall the tract has been eroded very much formed dissected hills of different height. The eastern most mountainous tract of this region is the Buxa area of Sinchula range near the Bhutan border in the district of Jalpaiguri which forms the Indo-Bhutan border. There are some renowned peaks like Chhota Sinchula (5695 feet), Renigango (6222 feet). To the south of the Sinchula, there lies a low range of hills like Durbindara, Buxa-Jaynati etc. There are a number of low ridges and valleys which have made the country much spectacular. The ridges gradually rise up from the valleys toward the west and finally got the height at Rishiala (10500 feet) near the trijunction point of Darjeeling, Sikkim and Bhutan.

B) THE ALLUVIAL PLAINS OF WEST BENGAL

The alluvial plains are the largest geographical zone of West Bengal. It is a very small part of the former 'Vanga' as stated in the Vedic literature, the Aitareya Brahmana. Except the northern mountainous regions and western table land, the entire region is under the alluvial plains which are formed by the alluvium of the river Ganga and a number of tributaries and distributaries of it. The region has stretched from the south of the Himalayan Mountainous region in the north to the Bay of Bengal in the south. Bangladesh is situated to the east and Bihar, Jharkhand and Western Table land are located to the west of the region. The plain in general and the delta is a land form of fluvial action (alluvial and deluvial) of the Gangetic river system. During the formation of the great Himalayan Range (Tertiary phase of earth formation) there created a trench to its south. Through a long period of time the mountainous surface of either sides of the trench is dissected frequently by the main streams like Ganga and Brahmaputra and their tributaries and distributaries and formed the alluvial plains into the trench. The glorious presence of lateritic tract between the Rajmahal and the Garo Hills may explain the episode which was followed by the laying down of the recent alluvium (late pleistocene) and successive southward march of the delta plain. The recent alluvium presents at the (a) Malda, West Dinajpur (North and South Dinajpur) tract, (b) The bordering tract of Chotanagour Highlands (Gandwanas and lateritic alluvial area), (c) The Duars of Jalpaiguri and Darjeeling and (d) Medinipur coastal tract. There is conspicuous absence of older alluvium soil in the delta region.

The alluvial plains can be divided into two major parts in respect of the river Ganga viz. the Northern Alluvial Plain and the Southern Alluvial Plain.
THE NORTHERN ALLUVIAL PLAIN:

From the Tarai region in the north to the river Ganga to the south consisting the districts Jalpaiguri\(^9\) (except the Boxa area), Siliguri Sub Division of Darjeeling, Kochbehar, North and South Dinajpur and Malda District are under this region. The alluvial plain is developed by the rivers Mahananda, Tista, Torsa, Jaldhaka, Raidak, Sankosh etc., which flow to the South or South-Eastwards from the Himalayan Ranges. This plain constitutes due to flood. The major river of this plain is the Mahananda. Among the tributaries of the Mahananda River, the Mechi and the Balsam of the right bank and the Nagar, the Tangan and the Punarbhaba of the left bank are worth mentioning. The Atrai River flows through Dakshin Dinajpur. Among the rivers following over Coochbehar the Tista, the Jaldhaka, the Torsa, the Raidak and the Sankosh are important. During rainy season all these rivers get over flooded. The entire region is formed as flood plain. Vigorous river action has imparted somewhat undulating land surface character to this plain. So the region bears some local characteristic of relieves and structure of soil and known in different names. Viz. eastern part of Jalpaiguri is known as Duars whereas the western part is called Tarai. The undulating little wasted land just to the south of Himalayan Mountains of West Bengal is called Tarai plain. Unconsolidated rock materials and coarser alluvium constitute the surface feature of the Tarai. It is a type of piedmont plain. The land here has very gentle slope towards the south. Besides there are some heaps of pebbles, stones etc. as well as some low land, marshy lands etc. The average altitude of this part varies between 75 mt. - 150 mt. having sloped toward south and south-east. South and Eastern part of Jalpaiguri District is called Duar. The term Duar is derived from the word 'door'. This region constitutes the doorway between the plain land of West Bengal and the mountainous land of Bhutan. So it is named as 'Duar'. Generally it is a zone of coarse alluvium like the Tarai.

The region is mostly covered with alluvium except the Boxa area where hard rocks is exposed though Geologically the region formed with Alluvium, boulder and pebble beds, sand stones with clay and lignite, slate, schist, phyllite, quartzite, dolomite, banded ferruginous rocks and gneiss.

From the south of the region Tarai-Duars the actually the alluvial region of West Bengal started. The alluvial plain is developed by the soil carried by the rivers derived from Himalayan Mountainous region. It is a flat country with slight south-eastward sloping. Sometimes there are also slit ups and downs. The low areas are overflowed by the rivers during the monsoon. The northern part of this region abounds a number of rivers most of which changed their course frequently. That is why there are a number of abandoned channels of rivers, which are also collect bils and marshes.
Some of the marshes produce sola (pith). The soil of this area is very recent alluvial formation, mostly sandy loose and ash coloured.

The eastern bank region of the river Mahananda basin is here known as Barendrabhumi or Barind. It is a part of old Ganga delta region. This undulating land surface is made up of old alluvium soil (pleistocene) which is well oxidized reddish coloured hard and infertile character. Kankar and ferrugious concretion are found in this formation, whereas the western or the right bank of Mahananda is made up of new alluvium. The river Kalandi flows through this plain. This tract of land on the left bank of the Kalandi is known as Tal. The word ‘Tal’ means lake. This region is a low flood plain which is inundated during rainy season. So many bils and marshy lands are located throughout this Tal region. Such type of Tal is also found in Coochbehahr plain. The soil of this area is blackish in colour and highly fertile as this type of soil is made up of new alluvium, known as ‘Diara’

The older alluvium of barind after covered by the flood plains of the rivers Mahananda, Tangan, Punarbhaha, Atrai etc. which flows southerly direction. Some of these rivers with headwaters in the Himalayan foothills have deposited a broad piedmont alluvial plain which overlap the Barind on the north.

SOUTHERN ALLUVIAL PLAINS

The southern alluvial plains comprises the districts Nadia, Calcutta, North 24 Parganas, South 24 Parganas, Howrah, Hooghly and the eastern part of Mursidabad, Burdwan and East Midnapur. The river Bhagirath-Hooghly is one of the principal right bank distributaries of the river Ganga, which flows southwards and finally poured its water to the Bay of Bengal. The southern alluvial plains can be divided into two parts by the river Bhagirath-Hooghly. They are as follows:

a) The Alluvial Plain, to the east of the Bhagirath-Hooghly or the Deltaic Plain:

The plain is a part of the greater Gangetic Delta. The triangular area from the east bank of the river Bhagirath Hooghly to the extreme boundary line of West Bengal. It is consists of the eastern part of Murshidabad comprising Baharampur (Sadar) and Murshidabad Sub Division, entire Nadia, North and South 24 Parganas and Kolkata. The tract is entirely flat and general sloping is south or south-eastwards. The height of the country is about 20 Mtrs. above sea level. The northern half of the plain comprising eastern Murshidabad and Nadia is very much interspersed with jhils, marshes and old river beds which carry the spill from the Bhagirath Hooghly, the Ganga/Padma, Jalangi, Bhairab, Mathabhanga and also their offshoots
during the rainy season. The entire area lies low and sometimes causes much suffering of the people. The region is an alluvial plain spreading approximately from the head of the great Gangetic delta.

The Ganga delta plain is the product of fluvial action. The silts brought down by the Bhagirathi Hooghly River and its tributaries like Ajay, Damodar etc. are deposited on the bed of the Bhagirathi Hooghly. Besides the volume of silts is immense in view of the fact the Ganga Bhagirathi Hooghly flows over here after crossing nearly 2971 KM distance. The valley here is very shallow and the river appears to be cut off from the Ganga. The Bhagirathi Hooghly river flows through a very narrow and meandering channels. Bils, swamps and marshes, levees and deltas are the remarkable components of the physical landscape. The bils are locally known as bagri. Rest of the region consisting both the 24 Parganas districts bears a dissimilar geographical characteristic than the previous. The region is intersected by tidal rivers. The deltaic formation is still going on and such formation is much active in South 24 Parganas district. The region is quite flat and is raised above flood level. It is the land of marsh levees, saline water lakes and the tidal forests. The forest is known as Sundarban, which is named after reddish colour wood trees 'Sundari'. The landscape is well marked with morasses and swampy islands which are separated by former estuaries of the Bhagirathi Hooghly interlaced with a network of large tidal creeks. Matla, Saptamukhi, Gosaba, Jamira, Bongaduni etc. tidal rivers are worth of mention. The island a like Delta of Greek letter. New island are being formed offshore, which do join with the mainland ultimately and therefore this active delta region is extending toward the Bay of Bengal to the south.

This seaboard zone is a living example of formation of new delta. The process of new land formation has been nicely described by W.W. Hunter in his Statistical Account of Bengal (Vol. I, Preface) as “a sort of drowned land, broken up by swamps, intersected, but a thousand river channels and maritime back waters, but gradually dotted, as the traveller recedes from the seaboard, with clearings and patches of rice land”. The southern part of the plain consisting south-eastern part of North 24 Parganas and southern part of South 24 Parganas, bears mangrove forest, popularly known as 'Sundarban'. The swampy islands of this areas are covered with mangrove forest.

b) The Alluvial Plain to the West of the Bhagirathi Hooghly:

The plain to the west of Bhagirathi Hooghly is consisting of the entire part of West Bengal to the west of Bhagirathi Hooghly except the western table land. The plain is divided into two vertical parts. The western part of the plain consisting the districts Birbhum comprising of Murari, Nalhati
Rampurhat, Mayuraswar, Sainthia, Labhpur, Nanur and eastern Bolpur Police Station area of the eastern part of Rampurhat and eastern part of Suri Sub Division; Farakka, Jangipur, Sagar Dighi, Khargram, Barwan area of the district Murshidabad; Sadar or Barddhaman and western part of Katoya Sub Division of Barddhaman District; Bishnupur Sub Division of Bankura; Arambagh Sub Division of Hooghly; Jhargram, western part of Sadar or Medinipur and western Ghatal Sub Division of West Medinipur District is called the Radh/Rarh plain. It is a real peneplain consisting of laterite & red soil. The ancient rock eroded and became a gently undulated plain. General sloping of the surface is eastwards and about 50-100 meters high above the sea level.

Eastern part of the plain bears a geographically different characteristic from the west. Rather the country bears the deltaic characteristics as the eastern plain of Bhagirathi Hooghly shows. The plain is developed by the deposition of alluvium carried by the Damodar, Rupnarayan, Ajay, Barakar, Dwaraka etc. groups of rivers. The sloping of the alluvial tract gradually from the north to south and then eastwards as is indicated by the flow of sluggish rivers and streams. The height of the surface is very near. To the east of the narrow alluvial tract is the river Bhagirathi Hooghly and Radh peneplain to the west.

The region consist of a narrow part of Mursidabad district beside the river Bhagirathi; eastern part of Katoya and Kalna Sub Division; Hooghly (Sadar), Chandannagar and Serampore Sub Division of Hooghly, Howrah and eastern part of Uluberia Sub Division of Howrah and Tamluk Sub Division of East Medinipur. The region is developed the alluvial deposition of the rivers Ganga-Bhagirathi-Hooghly and their tributaries.

To the coast of East Medinipur, there appears another type of plain developed by the deposition of alluvium and sand by the sea waves of Bay of Bengal and the rivers Rasulpur and Pichhabani. There appear a numbers of sand dunes which are about 10-12 metres high. Sometimes logged water forms waterlog between two sand dunes. The topography of this narrow strip is closely related to the sea. This coast line is almost smooth, convex carved and broken by the mouths of two small rivers like Rasulpur and Pichhabani.

C) THE WESTERN SEMI PLATEAU REGION:

The western semi plateau of West Bengal is a spur projection of Chotonagpur plateau of Jharkhanda. It bears the entire Purulia district, western part of Bankura, western arm of Burdwan, south-western part of Birbhum and western part of West Medinipur. Perhaps it may mention that
the table land covers a vast area of the south-western part of the province. The region is bounded to the north by the Chotanagpur plateau and the Bhagirath-Hooghly alluvial plains, Jharkhand plateau (Chotanagpur plateau) and a part of Orissa cover the western and southern boundary and the Bhagirath-Hooghly alluvial plains lead the eastern side of the western table land.

The northern most district is Bribhum of the region. The south-western part of the district bears the Sadar (Suri) Sub Division, comprising Khayrasol, Rajnagar, Dubrajpur, Suri, Mahammad Bazar and Rampurhat thanas of Bribhum district. A few miles away from the southern bank of the river Dwaraka entered in West Bengal leads the northern border of the region; Asansol and Durgapur Sub Division in between the rivers Ajay and Damodar under the district Bardwan; then the NH-60 indicates the boundary line between the table land and the Bhagirath-Hooghly Alluvial plains. Western portion of the road belongs under the table land. From Asansol the road passing through Bankura and Bishnupur onward it entered to the Medinipur town and finally it crossed the Bengal Orissa-border as well as the river Subarnarekha follows near the town Jaleswar in Orissa. Gangajalghati, Bankura, Onda, Khatra and Raipur P.S. area of Sadar Sub Division of the district Bankura; western part of Ghatal, Sadar and western Kharagpur Sub Division and the entire Jhargram Sub Division in Medinipur and entire Purulia district consist of Sadar North and Sadar South Sub Division bearing Jhalda, Jaipur, Arsa, Baghonundu, Balarampur, Barabazar, Purulia Muffussil, Purulia Town, Para, Raghunathpur, Neturia, Santuri, Kashipur, Hura, Puncha, Manbazar and Banduan Police Stations are under the western table land.

The landscape of the region is a semi barrener area of sandy loam and laterite soil with low hills. The region consists of undulated surface which gradually rises up to the west and marge into the Greater Gangatic Alluvial Plains towards the east and south-east. The surface of the table land is broken by the following of undulations. To the west, they rise up into ridges covered by laterite soil and disconnected by width river valleys. The uplands of these regions are actually the remaining spurs projection from Ranchi Plateau of Jharkhand to the west and acting as the waterheds of the Subarnarekha-Kasai-Damodar-Rupnarayan groups of rivers. The entire area has dissected naturally and now physically it became a peneplain. The remaining hard impervious rocks (Archeans) of the plateau formed as low lying hillocks like Ajodhya Pahar and Baghmundi Pahar of Purulia; Susuniya and Biharinath Pahar of Bankura; Mama-Bhagna Pahar of Bishnupur are mentionable hills of this region. Gorgaburu (677 mtrs.) and Karma Pahar (663 mtrs.) are respectively first and second highest peaks of Baghmundi Pahar of Purulia of the residual plateau area. Chotanagpur plateau is a part
of the peninsular shield of eastern India. The plateau of Jharkhand, popularly known as Chotanagpur plateau consists of the metasedimentary rocks of precombrain age, Gandwana sedimentary rocks, Rajmahal basalts and upper tertiary sediments upon which laterite soil grown up generally. Such type of land forms have developed gradually of riverine origin. The near horizontal area except the alluvial plain to the western bank of the river Bhagirathi-Hooghly is known as western table land. It is also known as Radh/Rarh.

The pattern of development of the material culture of a country is based primarily on its geographical features, depending on factors like attention, relative isolation.

West Bengal is only a state in Eastern India which stretches from the Himalayan Mountainous range in the North to the Bay of Bengal in the South. It has a vast alluvial plains as well as semi plateau region. So the topography of the province is very diverse in nature. Highland areas like mountains, hills have the alignment of ranges and the steepness of slopes. The highland areas like the plateau, find out the nature of the surface, whether it is a rolling upland or a dissected plateau. The low lands indicate the direction and the gradient of the slope and through which the important rivers and their tributaries flow downward. The drainage patterns of hilly regions, plateaus and lowlands are different. River values can be identified differently in their different courses. Natural vegetation provides an indication of climate, soil, land use and occupations. As for example, deciduous forests are the most widespread natural vegetation found on hill areas in West Bengal or mangrove forests are the natural vegetation of Sundarban area. Dense forests are shown in the heavy rainfall areas. Absence of vegetation indicates erosion of land, scattered trees, found on lowland areas indicate that agriculture is the occupation of people in these areas.

Most highland areas with steep slopes are not suitable for agriculture and it may be fit for grazing. Flat top of plateaus may be used for cultivation. On the other hand the broken ground of lowland areas would indicate the presence of soft soil, silt deposited by the river. Such silt deposited alluvial soils are very good for agriculture. Side by side the flood plains of rivers are most fertile and indicate intensive agriculture. Such fertile and intensive agricultural alluvial plains are the birth place of prosperous ancient civilization. Settlements are generally grown up on either side of the rivers where irrigation for the purposes of cultivation is possible.

The human activities like use of land, settlement, pattern of population, trade routes or trade centres, occupation etc. are entirely depends on the physical environment of that very region. Here in my thesis I have tried to show the folk art and craft culture of a particular region grows up, using local raw materials to serve the local needs. So I have taken the Chapter.
GEOLOGY

The Bengal basin covers the most parts of West Bengal and Bangladesh and it has formed the world’s largest delta by the Ganga Brahmaputra river system. The quaternary alluvium of the Gaga and the river Brahmaputra and their tributaries & distributaries lying beneath it are almost all the older rocks of the Bengal basin. The tectonic frame work and the origin of the basin have been highlighted in the work of different scholars in different times like Biswas,28 Sengupta,29 Morgan & McIntire, Chakraborty, Ghosh & Majumder and several others. Their concepts of Bengal basin being a niogeosyncline signifies orogeny related mobile down warping of the basement rocks in creation of a subsiding basin where sedimentation continued without volcanism.30

The recorded occurrence of Paleocene rocks of great depth in the Bengal basin indicates a possible relation of such tectonism with the early phase of Himalayan orogeny, though-tends of marginal faults on the western margin of the basin do not confirm to the prevailing Himalayan trends.

The present West Bengal is a product of long geological formation. There was widespread marine transgressions followed by regression with consequent uplifts in its geologic history from the Pleistocene time has taken place. During the pre-quaternary age the shield area on the west of West Bengal was comprised of Archaean-Proterozic rocks. The oldest rocks found here are pra schists and a gneisses which include phyllite, carbon-phylilite, garnetiferous, talc-chlorite tremalite schist etc. These rocks are mainly found in western and north-western parts of Midnapur district, south-western part of Bankura and southern part of Purulia district. In Midnapur, Bankura, Birbhum and Burdwan the presence of tertoary grits, gravels, soft sand stone and shales with or without Miocene fossil wood are reported and mapped in isolated patched by Hunday, Raya Rao, Chowdhury, Banerjee.31

The Quaternary geology of West Bengal is somehow different from pre-quaternary age. The quaternary geological studies have been carried out every extensively in the self zone to the west to the Bhagirathi-Hugly which stretches from the eastern margin of the shield on the west to the Bhagirathi-Hugly River on the east and from Farakka on the north to Digha-Haldia line on the south. The oldest alluvial terrace sediments developed stratigraphically above the lalgarh formation is a thick sequence of rather compact. These sediments have been mapped as Sijua formation in Kasai basin, Babladanga-Bamundiha formation in Bankura district, Belda formation and Kusumgarm formation respectively in Midnapur & Burdwan districts, Rampurhat formation in Birbhum & Murshidabad districts and as Nutanhat formation in Ajay basin. These younger terrace sediments have
been mapped as Daintikri formation in Kasai basin by Ghosh & Majumder in 1981, Paskura formation in lower reaches of Kasai River, Bansol formation in Bankura district, Kandi formation in Bhuban and Murshidabad, Kanthi formation & Kalna formation respectively in Midnapur & Burdwan districts have sediments containing grayish black to black fine sand, silt and clay of middle Holocene period.

**CLIMATE**

Geographical location and physical settings has great impact on the climate of a region or country. West Bengal is located in the northern hemisphere of the earth and the climate varies from tropical savana in the north to humid subtropical in the south. The periodic shifting of the position of the Sun, with reference to the earth mainly controls the season and weather conditions. West Bengal experiences a hot and humid monsoonal climate. Summer in this region is excessively humid, although the western highlands experience a dry summer like that of northern India. In summer, the temperature ranges from 38°C-45°C. The proximity to the Bay of Bengal, the alignment of the Himalayas in the north and the Tropic of Cancer passing through the middle of the Southern Bengal influence and mould the climate of West Bengal.32 There are regional variations in the climate of west Bengal. The diversity in physiographical features as well as in geographical situation of its different parts have caused diversity in the climate of West Bengal. The most striking feature of its climate is the alteration of seasonal winds known as monsoons. During winter, wind blows from land to sea as the north-eastern monsoon. This wind is very cold and extremely dry. During summer, there is complete reversal of winds which blow from seal to land as the south-west monsoon. The north-east monsoon and the south-west monsoon are the principal features in the meteorology of West Bengal. Between the periods of blowing of the two principal monsoons over West Bengal are two transitional periods. According to variation in the elements of weather and climate a year is conveniently divided into the following four principal seasons.33

1) Summer season (March to May).
2) Rainy season or South-West Monsoon season (June to September).
3) Autumn season (October to November).
4) Winter season (December to February).

Summer Season:

March to May is usually a period of continuous and rapid rise of
As the subsolar point (vertical ray of the Sun) advances towards the Tropic of Cancer, temperature towards the Tropic of Cancer over the whole of West Bengal rises very high by the middle of May. The heat is somewhat bearable in the Deltaic Plain owing to nearness to the Bay. Owing to the presence of bare rock exposure, the Western Highlands and Plateaus region contribute to little higher temperature average (33°Celsius) in May, but the temperature rises up to 50°C. Violent local storms often develop in the localities where heavy humid wind from the Bay meet hot, dry, land winds. The storms are accompanied by violent winds, heavy rain and hail. Such storms are actually Nor’ Westers because the accompanying squalls comes from the north-west. These Nor’ Westers strong winds known as the ‘Kal Baishakhi’ in West Bengal. They are called Kal Baishakhi which means ‘Calamity of the month of Baishakh’ because they cause much destruction in West Bengal and they occur in the month of Baishakh according to the Bengali calendar. Convergence of dry north-western wind and moist southern wind causes thunderstorms. The summer in West Bengal is characterized by three air streams - (i) the north-westerly air masses from the north-west India, (ii) the shallow southerly air masses from the Bay and (iii) the mild easterly to north-easterly air masses through the Brahmaputra valley. There might be a convectional overturning of air masses if result in local depression causing Kal Baishakhi. They cause pre-monsoon showers.

Rainy Season:

June to September is usually rainy season in West Bengal. During summer, temperature steadily rises throughout West Bengal. The atmospheric pressure decreases progressively till it is at its lowest in July. The south-west monsoon wind blowing over the Bay is directed towards the Myanmar coast. A part of this winds advances northward. This monsoon wind gives rain to whole of West Bengal. The foothill of the Himalayas on the north receives more rainfall. The Bay depressions are at the root of most of the monsoonal rainfalls in West Bengal. This monsoonal rainfall commences by the first week of July. July emerges as the wettest month of West Bengal. High relative humidity along with high temperature and heavy rainfalls are the characteristics of this season. The climate is often sultry during this season.

Autumn Season:

Generally by mid October, the monsoon, withdawals and this is followed by a short transition between the rainy season and the cold season. The lower pressure conditions developed in the monsoon season are obliterated by October. They are shifted to the centre of the Bay by the beginning of November. After September, temperature falls gradually in West
Bengal. The gradual decline in an average monthly temperature becomes well marked as it falls by 3° celsius to 5° celsius between October and November. This marks the start of the winter season. The Bay cyclone forms in this season. It gives rise to moderately disturbed weather and is valuable sources of rainfall in West Bengal. Morning fogs are also common in this season.

Winter Season:

The season continues December to February usually. In November, the weather of West Bengal is characterized by clear sky, pleasant cool weather, mild northerly winds, low humidity (50%), and high diurnal range of temperature. The actual cold weather commences in December and continues till the end of February. January invariably appears as the coldest month with temperature ranging between 17° celsius and 24° celsius. The temperature increases southward owing to the proximity of the Bay. The cold waves prevail in the hills, bringing down the temperature of Darjeeling and Kalimpong below freezing point owing to altitudinal effect. Intense northerly or north-westerly winds blow over West Bengal some days in winter. The weather changes are associated with the occasional western disturbances causing rains, but cold waves are rare. The winds are light and variable.

DRAINAGE

West Bengal used to be known as the land of rivers. The drainage system of West Bengal has formed by the tributaries and distributaries of the Ganga and the Brahmanputra along with some significant and insignificant rivers discharging into the Bay of Bengal. The source of major rivers of West Bengal are the Northern Himalayan Mountains and western plateau. The rivers of former sources are mostly snow-fed and the rivers of latter sources wholly rainfed. The part of Gangatic delta in West Bengal is criss-crossed by dead or dying channels. The extensive delta that was built up by the muddy waters brought down by the Ganga and the Brahmaputra has been famous as the 'Ganga Delta' or 'Sundarban Delta'.

The rivers of West Bengal are classified under three grounds, namely snow-fed rivers, rain-fed rivers and tide-fed rivers.

A) Snow-fed Rivers:

Almost all the rivers originating in the northern Himalayan Mountains flow southward. As these rivers are snow-fed they contain flow of water round the year. Among these rivers, the Ganga, the Bhagirathi-Hooghly, the Mahananda, the Balasan, the Mechi, the Tista, the Torsha, the Jaldhaka, the Great Ranjit, the Little Ranjit are important. The major river of West Bengal is Bhagirathi-Hooghly. (Map No. 5)
The Ganga: The flows between Malda district and Murshidabad district. The Ganga is divided into two main distributaries, the Padma flows eastward into Bangladesh and the Bhagirathi-Hooghly flows southward into West Bengal. Both the distributaries drain into the Bay of Bengal ultimately.

The Tista: The Tista is the largest river of the North Bengal. It is the combined streams of the Lachen river of Tibbet and Lachan of Sikkim which rise from the tongues of the Kanchanjungha glacier. It has formed southward drainage. Crossing Sikkim it enters the Darjeeling district where it is joined by the Great Ranjit. It flows through a deep gorge in the Darjeeling district, flanked by the Darjeeling Hills and the Kalimpong Hills on either side of it. The Tista bed widens considerably on reaching the Jalpaiguri district. The Tista creates flood almost every year during rainy season. Recently Tista barrage project has been taken up for flood control, irrigation and hydel power generation. Ultimately Tista enters in Bangladesh.

The Mahananda: Rising from the Mahaldhirama range near Ghum of the Darjeeling district. The Mahananda river flows through the North Bengal. Siliguri and Malda are situated on its bank. The Mahananda is the longest river in North Bengal. But it flows to a considerable length through the State of Bihar. The river is fairly deep and navigable by country boats. It receives on its left bank a number of tributaries such as the Nagar, the Tangan and the Punarbhaha, and on its right bank the Kalindi. Other tributaries, like the Balasan and the Mechi are mountainous. Both the Balasan and the Mechi are right bank tributary.

The Jaldhaka:

The Jaldhaka drains southward through the Jalpaiguri district. It is longest river in the Jalpaiguri district. It is one of the major rivers of the Tarai-Duars region. The combined streams of the Dichen of Sikkim and the Lichen from the Jaldhaka river. After taking the name, Jaldhaka river, at Richi La it flows on the eastern parts of the Darjeeling district. A number of mountainous streams, locally called khola join the Jaldhaka.

The Daina, the Bandukhola, the Birukhola, the Naksalkhola, etc. are its importance tributaries. During the rainy season the Jaldhaka flow in spate. A dam has been constructed on the river at Bindu north of Metali of the Tarai-Duars region with the object of controlling flood and generating hydel power.

The Bhagirathi-Hooghly:

The Bhagirathi-Hooghly is the supreme river of West Bengal. It is, in fact, the westernmost distributary of the Ganga which flows between the
Malda district and the Murshidabad district. The Bhagirathi-Hooghly is a great distributary of the Ganga. It takes off from the Ganga below Farakka. The present off-take point is near Geria at Biswanathpur. At present the Bhagirathi-Hooghly does not carry much water from the Ganga. The major portion of water of the Ganga drains eastward into the other great distributary known as Padma. The Padma flows through Bangladesh. The Padma shares major portion of waters of the Ganga. It has caused an unfortunate loss of navigability of the Bhagarithi-Hooghly river. The Calcutta port has been badly affected. In order to revive the navigability of the Bhagirathi-Hooghly a barrage has been constructed on the Ganga at Farakka between Murshidabad district and Malda district. The Bhagirathi-Hooghly receives water from its left bank feeders like the Jalangi and the Churni. Besides, the Dwarakeswar, the Ajay, the Damodar and the Rupnarayan and the Haldi are the major right bank tributaries which keep the Bhagirathi-Hooghly river alive.

The Bhagirathi-Hooghly river at its mouth in the Bay of Bengal is divided into a number of channels called distributaries. Major distributaries are Bertala, Saptamukhi, Jamira, Matla, Goyasaba, Harinbhangha, Vidyadhar, Piyali, Raimangal, and so on. The mouth of the Bhagirathi-Hooghly river is about 20 km wide and that of the Matla about 15 km. At high tides southern parts of these rivers are inundated. The Bhagirathi-Hoogli joins to the bay near Sagar Island. It is also believed that before the Rennal's drainage survey Bhagirathi-Hoogli lay further east flows through the deserted channel 'Adi Ganga'.

B) Rain-fed Rivers:

The rain-fed rivers are the right bank tributaries of the Bhagirathi-Hooghly river. They come down from the Chotanagpur plateau on the West Bengal. These tributaries are rivers of the Rarh region. They are all rain-fed and consequently are mere trickles during the greater part of the year. As their beds are heavily silted, they flow in spate during rainy season. The Bansloi, the Pagla, the Brahmani, the Dwaraka, the Mayurakshi (Mor), the Bakreswar, the Ajay and the Damodar are rivers of the northern part of the Rarh. To the south of the Damodar are the Dwarakeswar, Silai (Silabati), the Rupnarayan (formed by union of the Dwarakeswar and the Silai), the Kasai (Kangsbadi) and the Haldi (formed by union of Keleghai and the Kasai). The Mor, the Damodar and the Kasai have been brought under control with the help of constructing dams and barrages on them.

C) Tide-fed Rivers:

Matla, Bartala, Saptamukhi, Goyasaba and the like distributaries of the Bhagirathi-Hooghly river are called tidal rivers. They are fed by the tides.
At high tides they overflow. These rivers are active. The northern portions of these rivers are shallow but the southern portions are deep owing to the flow of tidal water. These southern parts are also very wide. The mouth of the Matla is about 15 km wide. These rivers experience flood current which is the landward or incoming current that accompanies high tide and the outgoing ebb current which is the Bayward or outgoing current that accompanies ebb tide. During each high tides, strong tidal current occurs. It originates a tidal bore. It is a wave of water passing up the river from the Bay as the tide rises. The dangerous rush of water through the mouth makes navigation very difficult. At each high tide river banks are inundated. The swelling waters rush over the land barrier and up the river as a rapidly making wall of water. The time period between flood and ebb, with no current, called slack water causes deposition of fine sediments in layers. Mudflats exposed at low tide but covered at high tide grow up. Next, a growth of salt tolerant plants takes hold on the mudflats. The plant stems entrap more sediments and the mudflat is built up to approximately the level of high tide, becoming a salt marsh. Tidal currents maintain their flow through the salt marsh by means of a complex network of sinuous tidal rivers. About 112 km wide belt of delta running along the Bay has a tidal forest, known as the Sundarbans.

SOILS

West Bengal spread over 34,267 sq. mile (88,750 sq. km) in eastern India. It has two broad climatic regions such as Himalayan & sub Himalayan West Bengal and the Gangetic West Bengal. The province has many different kinds of soils because it has a wide range of environment conditions, such as parent material, climate, relief, drainage, vegetation etc. The largest portion of the state is covered with alluvium. The lateritic region is located in the west. The soils of West Bengal may be grouped in several categories, as (a) Mountain and tarai soils, (b) Laterites, (c) Red soil (lateritic alluvium), (d) Alluvial soils, (d) Saline soils.

a) Mountain and Tarai Soils:

This type of soils deposition are located at the foothills of the Himalayas. The unassorted materials are mostly sandy, raw humus type and deep black to grey black in colour. This are brought down by the hill rivers like Tista, Torsa, Mahananda, Jaldhaka etc. and their tributaries and responsible for the typical tarai (duars) soils in Darjeeling and Jalpaiguri. Vegetation and altitude played a major role in the formation of this type of mountainous soils. This type of soil is deficient in organic materials. The soils are acidic, poor in bases and available plant nutrients.
b) Laterite Soils:

The lateritic soils are found in the undulating well drained tract along the Chotonagpur table lands covering the western part of West Bengal and at places where honey comb structures of the rocks are exposed. The soils are acidic in nature and very poor in organic matter, nitrogen, available calcium and phosphorus. These undulating tracts are without vegetation and poorly aggregated. These types of soils have low water holding capacities.

c) Red Soils:

The transported laterites, deposit on the eastern flanks of the lateritic stretch are found in the eastern margins of the Rarh plain and the Barind tract of Malda and Dinajpur (North & South Dinajpur) districts. The ancient crystalline and metamorphic rocks on weathering have given birth to red soils. These are the transported soils from the hills of Chotanagpur plateau. Morem and feldsper and sometimes lime concretions are also found in the bed. This soil is acidic in nature and poor in organic matter and also coarse textured.

d) Alluvial Soils:

Alluvial soil is the prime soil in West Bengal. The area under agriculture. The alluvial soil is mainly manifested in the province. Depending on the nature of the parent materials, alluvium tract is divided into two families, like the Vindhya alluvium and the Ganga alluvium. The narrow alluvial strip along the lateritic and red soils, found along the outer edge of the plateau fringe in parts of districts of Murshidabad, Bankura, Bardhaman, Hoogli and Medinipur districts are known as Vindhya alluvium or old alluvium. The riverine tract of Damodar and Kansai of old alluvial group have "alternating sand-beds and immature and irregular stratification and hence, ill developed profiles." These soils are poor in plant nutrients and organic matter. On the other hand the alluvial tract occurs mostly in the districts of Murshidabad, Nadia, and both the 24 Parganas, Malda, Bardhaman, Howrah, Hooghly and Midnapur. This new alluvium is spread near the river in rich in plant food and organic materials. It is also alkaline in reaction.

e) Saline Soils/Coastal Soils:

Saline soils have been formed from deposits brought by tidal currents. Due to cut off the parental source, numerous tidal flat creeks were formed. The Howrah, South 24 Parganas and East Medinipur districts and Sundarban form the coastal strips of West Bengal. This coastal area is come out of the interaction of the river Ganga and tides of Bay of Bengal. This type of soils
are highly saline and alkaline and contain deposits rich in calcium, magnesium or consist of half decomposed organic matter.

MINERALS

West Bengal is a reachy storage of Minerals. The mineral sources of West Bengal provides a rich source of industrial raw materials which help in the growth of highly developed industrial belts in the province. The western and south-western belt or the western table land of the province has a very rich and important in minerals. Side by side, the Duars area comprising Darjeeling and Jalpaiguri districts is a minor mineral resources in the northern belt. The western table land, consisting of the districts of Purulia, Bankura, Bardhaman, Birbhum and Midnapur districts is richer and important in mineral resources than northern belt.37

Coal is the most important mineral of the region as it is one of the main source of power and raw material. The huge coal deposit of the Raniganj Coal Field in Bardhaman district has made West Bengal in second position among the major coal producing regions in India. The coal is of good quality. In 1920, the first Indian Coal Industry was opened in this area at Sitarampur. The Raniganj Coal belt extends beyond the border of West Bengal into the Chotanagpur plateau of Bihar. Coal seems to have been categorized into 'low volatile' Barakar series (lower) and 'high volatile' Raniganj (upper) series. The quality of the Raniganj coal has been graded into three types.

a) Cooking coal of high grade.

b) Non-cooking coal of high grade.

c) Coal of inferior quality (which has huge deposits in this area).

The high quality of Raniganj coal is used for metallurgical purposes, locomotives and cement works. This coal also serves as pulverized fuel in copper mines and is used for graded carbonation of gas production and thermal power generation. The adjoining ore deposits of iron, copper, lead, zinc etc. and the close proximity of Calcutta by railway connection has helped in establishing mineral based large scale industries around Asansol in Bardhaman district. Later, a more sophisticated industrial complex developed in nearby Durgapur. Some inferior quality of coal is also found in Darjeeling.

Iron deposits are also occurs in this zone. It occurs in four series; (1) Banded haematite quartzites containing good quality ore in Buxa (the Duars). (2) Clay limestone of iron stone shales. (3) Lateritic ores of the eastern Raniganj coal fields. (4) Magnetite patches of Archean metamorphic rocks. Nowadays these lateritic deposits are used mainly for building purpose.
Copper is found near Buxa in the Duars region. Plastic fire clay deposits has been moned in Barakar field compressing of places like Barakar, Suri etc. Numerous small reserves of China Clay are scattered in Birbhum and Bankura districts. Large deposits of limestone is found in Jhalda of Purulia district. This clay is extensively used for cement making. Limestone and dolomite are also found at Jhilimili in Bankura districts. Dolomite also occur extensively in the foothills of Himalaya. The high peaks of Buxa Duars are made up of dolomites. Radio-active minerals are available in Madhabpur area of Bankura. Manganese ore has been quarried near Belpahar near Gidni railway station in Medinipur. Soap-stone occurs in Medinipur districts and Darjeeling.

Mica is found in the crystalline gneisses and schists Bankura, Medinipur and Purulia districts. The reserves of Pyrite and arsenopyrite are available in some places of Purulia districts. There are also expectations of mineral oil beneath the aluvial cover. Wolfram occurs at Jhilimili and Porapahar in Bankura which yields tungsten that is used for making extra hard steel.

FLORA

As of 2013, recorded forest area in the state is 16,805 km² which is 18.93% of the state’s geographical area, compared to the national average of 21.23%. Reserves, protected and unclassed forests constitute 59.4%, 31.8% and 8.9%, respectively of the forest area, as of 2009. The diversity of West Bengal's climate and topography is reflected in its rich flora & fauna. West Bengal is rich in flora and fauna and has diverse ecosystems because of its varying terrain from the high altitudes to the sea level plains. There are humid tropical forests in the extreme north of West Bengal and the mangrove and tidal forests in the southern part in the Sundarban are the main reserves of natural vegetation. The western fringe is covered by tropical deciduous forests. The dynamics of the geotectonic formation of the eastern Himalayas, the rich alluvium and heavy rainfall in the Tarai and the Duars region and the physical geography of northern Bengal have resulted in abundance of vegetation almost continental in its variety. The rich floral concentration in the Bengal is one of the main sources of economic and medicinal prosperity of West Bengal. The natural vegetation of West Bengal can be divided as below.

Mountain Temperate Forests:

Above the 1000 mt altitude these types of forests are found. Between 1000 mt-1599 mt altitude in the sub-topical forests Terminalia. Cedrela, Michelia, Bamboos (Bambusa) and various Laurels are found. From 1500 to 3000 mt altitude in the temperate forests oaks, conifers, large
rhododendrons, deodar, beeches, magnolia and various kinds of temperate
berries are the common vegetation. Due to misty climate on the southern
slopes, the trees are covered with mosses and orchids. Large plantations of
an exotic species, cryptomeria and japonica have been raised in higher hills.
Above 3000 mt silver fir (Abies densa) is abundantly grows. Dwarf
rhododendrons are common here.

Tropical Forests of the Duars:

Due to high rainfall and climatic condition the most of the forests of
Duars region are very dense in nature. In these moist deciduous forests, Sal
(Shorea robusta) is the most common and valuable tree. Most of these forests
are protected because rare and valuable trees are found in these forests.
They are champa (Michelia champaca), chilauni (Schima wallichii), khair
(Acacia catechu), gamar (Agmelina arborea) adn toon (Cadrela toons).
Bamboos are found in plenty. Talol grasses along the rivers, evergreen laurels
under growth of shrubs and bushes, orchids and giant creepers together
form impenetrable vegetation. Rauwolfia serpentina, a variety of scrub is
abundantly found in these forests, is now grown in plantation for its high
medicinal values.

Deciduous Forests of the Western Fringe:

Deciduous Deciduous and scrub vegetation covers greater part of the
western fringe of West Bengal. The forests over here are mainly composed of
sal along with mixed of haldu or dacum (Adina cordifolia), pala (Butea
monosperma), piyal (Buchanania lanzam), gabdi (Cochlospermum), kend
(Diospyros melanoxylon), simul (Bombax malabaricum), harra (Terminalia
chebula), khair kusum (Seleichera olcosa), arjun (Terminalia arjuna), baheera
(T.belerica), haritaki (T.chebual) and others. Most of the trees are of high
economic values. The undergrowths of the forests and their outskirts consist
mainly of jati (Barleria cristata), parshi (Cleistanthus collinus), kurhci
(Holarrhean antidysenterica), kul (Zyzyplus mauihiaan), saiklu (Zyzyplus
oeoplia) etc. satamul (Asparagus recemosus), alkisi (Mucunaprurita),
kumarika (Smilax zeylanica) etc. are the common lianes climbers of the
forests. The western fringe forests are basically a rich store house of medicinal
plants like basaka (Dhatoda vasica), kalmegh (Andrographis racemouses),
nata (Aesalpinia crista), barun (Crataeva nurvala), eksuti (Eclipat protrata),
sarpagandha (Rauvulvía serpentine), gualncha (Tinospora cordifpla) etc.

Mangrove Vegetation of Sundarbans:

The Sundarban area is mainly covered by thick evergreen trees and
shrubs which are typical of mangrove or littoral forest. This type of trees
thrives in the saline water washed in with the tide. Spikes stick out of the
muddy ground absorbing air from the inner, submerged roots. The dense vegetation cover naturally provides decayed vegetational matter to the soil but too much heat oxidizes much of it, and there is very little peat formation. Sundarban, the place that owes its name to Sundari trees, consist of a large flora population like Genwa, Dhundal, Passur, Garjan and Kankra. One of the most remarkable features of this place is the bayonet like roots of mangrove forests that stick out above the water level. The sundari (Heritiera minor), garan (Griops roxburgliana), gewa (Excoccaria agallocha), dhundal (Carapa oovata) and kewa grasses are the common vegetation of the salty marsh. Savanna grass is found in plenty in the seampy islands. Palmyra palm (Nipa fruticans), detepalm (Phoenixpaludosa), coconut palms (Cocosnucifera) and rattan (Calamus) occur extensively. Ferns and orchids are also found here.

Coastal Vegetation:

Keya or kewra bushes which grow in extensive clumps are the most common vegetation in the coastal area of 24 Parganas (north and south) and Medinipur districts. Bamboo groves, coconut trees, small date palms are also found here. The saline marshes are covered by mossy vegetations and water creepers.

Natural Vegetations of the Plain:

Deforestation due to the increasing density of population, conversion to agricultural lands, industries and other uses has severely diminished the vegetation of the rich plains of West Bengal. Still there are some common trees which grow naturally. They are bat or banyan (Ficus bangalensis), aswattha or papal (Ficus Indiana), bakul (Mimusops elengi), sirish (Albizzia lebbeek) and neem (Azadirachta indica) are commonly found all over the plain. Bamboo groves, date palms, palmyra palms and babla or babul (Acacia arabica) are also encountered here. There are a large number of aquatic and amphibious species like kachuripana (Eichhorinia brassipes), kulekhara (Hygrophila surieulata), paniphal (Trapa natens), shaluk (Nymphsa nouchali) etc. which are largely found in the margins of tanks, bunds of the paddy field and marshes.

It is worth mentioning that a large number of medicinal plants are found in the Darjeeling region. The following species of medicinal plants which are found abundantly and now intentionally grown are as follows:

1) Achyranthes aspera (Apang).
2) Atropa bellabonna (Belladonna).
3) Asparagus racemosus (Satamuli).
4) Cannabis sativa (Ganja).
5) Datura fastposa (Dhatura) etc.

The Bengal province, according to Hooker (1854) contained only two phytogeographical regions, (i) the Gangetic plain, and (ii) the littoral-forests of the Sundarbans. It has been estimated that there are about five thousand angiosperm (flowering plants) species in Bangladesh. The Bangladesh plains are famous for their fertile alluvial soils which support extensive cultivation. Weed flora, both indigenous and exotic, thrive well in the marginal lands. Clerodendrum viscosum (Bhat), Glycosims arborea (Dantamardan), Heliotropium indicum (Hatishud), Xanthium strumarium (Ghagra), Alternanthera sessiles (Sechi), Lippia nudiflora (Bhuiookda), and Croton bonplandianum (Panimarich) are frequently encountered in the region. Various water bodies and wetland ecosystems provide habitats for diverse kinds of aquatic plants (hydrophytes), eg Potomageton (Ghechu), Lemna (Duckweeed), Pistia (Topa pana), Hydrilla, Vallisneria (Dog grass), and various insectivorous plants including Utricularia (Jhanji). In ditches, canals and ponds floating ferns like Salvinia and Azolla grow in large number. Almost throughout the country the introduced floating plant, water hyacinth (Eichernia crassipes) grows profusely and often becomes a troublesome weed in the agricultural land. The beautiful flowers of water lilies (both white and blue) and the sacres lotus (Nelumbo nucifera) depict a scenic beauty during rainy season.

Marine plant diversity (Marine algae resources), particularly in the Bay of Bengal estuaries are quite rich and diverse, but these are being indiscriminately extracted and over-exploited, resulting serious depletion of these resources. Agricultural crop diversity of West Bengal is predominantly agrarian and is rich in germplasm resources of some of the world’s most important crops such as rice, jute, tea, potato, amaranth, banana, brinjal, chilli, cotton, bean, lime, litchi, taro, yam, bamboo, rattan etc. The most predominant crop is rice.

FAUNA

The diverse faunal concentration in West Bengal displays a remarkable feature but in the recent time with the increasing density of population, the forests has been largely destroyed for the agriculture, industrial and urban development and it has already affected the wildlife of this state. Still, this state posses a good variety of wild life. The variety of wildlife in West Bengal is truly astonishing, no where else can anybody find such a fascinating variety and numbers it possesses. Mainly, the North Bengal and the Sundarban areas are the main homeland of these unique and rare animals which play an important part in our ecosystem.39
In the dense forests of North Bengal about 90 species of mammals have been identified which is very rare type. They are not even found in a few hundred kilometers west in the outer Himalayas and more remarkably they are not even identical with those found in Western Ghats and Peninsular India. The mammals include wild elephants (Elephas maximus), Nepal clouded leopard (Neofelis nebulosa macroseeloides), the east Himalayan marble cat (Pardofelis marmorata charltoni), and the golden cat (Profelis I.temminekii). Among the monkeys, the golden species in the 1970s. The Himalayan jackal (Canis aureus) and hill fox (Vulpus bangalensis) are commonly found and Nepal wild dog (Cuon alpinus primoevus) is seldom seen. Apart from the sloth bear (Melurses ursinus) and the Himalayan black bears (Selenuretos thibetanus), there is the cat bear (Ailurus fulgens), which can be easily tamed. The Indian hare (Lepus nigricollis) occurs in the Darjeeling district and the Sikkim vole (Pitymus sikimensis) is found only at high altitude. The Indian bison (Bibosaurus) is protected here. The Buxa tiger reserve, in the Jalpaiguri district, forms a vital linking corridor for elephants migrating between the forest of Bhutan the to the north and the Manas tiger reserve in Assam to the east. Sambar (Carvus unicolour), blackbuck or Indian antelope etc. are found in the Buxa reserve. Jaldapara sanctuary was established in 1943 for the protection of Wild Life, particularly one-borned rhinos, an animal threatened with extinction.

Bengal has a colourful variety of birds. Exotic Migratory birds come to the state during the winter months. About 550 species of birds has been reported from the Darjeeling district alone. The largest is the lammergeyer or bearded vulture. A rare bird is the Indian three-toed kingfisher (Ceyx erithaca erithaca). There are five species of hornbills including the Indian great hornbill (Dichocheros bicornis). Among fifteen species, the huhua nipalensis is one of the most powerful bird. Darjeeling district contains about a quarter of all the birds species found in the Indian subcontinent. Some rare and endangered birds are monal (Lopophorus impejanus), the hornbills, the imperial pigeons and green pigeons which are generally found in the North Bengal forest.

The Sundarban, the largest estuarine delta in the world often an adventurous wildlife and the biggest colony of the Royal Bengal Tigers. This national park is spread out over an area of 16,500 sq. km. The core area of the Sundarbans Wildlife Sanctuary in West Bengal, India consists of 1330 square kilometers of marshland. This core area of the Sundarbans Wildlife Park is home to more than 200 Royal Bengal Tigers. This wildlife sanctuary also has a considerable population of Crocodiles, the Ridley Sea Truffle and the Gangetic Dolphin. The Sundarbans Wildlife Sanctuary offers a habitat for a variety of reptilian fauna such as the River Terrapin, Monitor Lizard, Water monitor and the Indian python. The water creeks at the Sundarbans
Wildlife Sanctuary are breeding grounds for quite a few species of fish. Spot crabs and other mollusks are commonly found in the Sundarbans Wildlife Sanctuary.

Hyena is a nocturnal animal and found in the forest districts. A few varieties of monkeys and langurs are also found in West Bengal. The assamese macaque (Macaca assamensi) though gets its name from Assam are found in the forests of the Sundarbans. Hanuman langur is found every where in West Bengal. Of the fresh water turtle, the most abundant are the flap-shell turtle (Lissemys punctata) and the black spot turtle (Melanochelys trijuga), both of which are widely eaten. The most unique of the world’s crocodiles, the long-snouted, fish eating gharial (Gavialis gangeticus) is found in West Bengal and inhabitants in the fast flowing river like Ganga. Marsh crocodile (Crocodylus palustris) and the salt water crocodile (Crocodylus porosus) are found in the Sundarban area. The wildlife parks and reserves of West Bengal are as follows:

1) Ballabhpur Sanctuary, Santiniketan, Birbhum.
2) Buxa Tiger Reserve, Jalpaiguri.
3) Halida Sanctuary, South 24 Parganas.
4) Jaldapara Sanctuary, Jalpaiguri.
5) Mahananda Sanctuary, Darjeeling.
7) Gorumara National Park, Dooars.
8) Neora Valley National Park, Kalimpong.
9) Singalila National Park, Darjeeling.
10) Lothian Island Wildlife Sanctuary, Saptamukhi.
11) Sajnekhali Wildlife Sanctuary.
12) Ramnabagan Wildlife Sanctuary, Burdwan.
13) Rasikbil Bird Sanctuary Cooch Behar.
14) Senchal Wildlife Sanctuary, Darjeeling.

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