CHAPTER - 2

GEOGRAPHICAL BACKGROUND

a mixture of nature's bounty and complex demography

2.1 Introduction

Jalpaiguri is said to have derived its name from the olive trees (called "*Jalpai*" in Bengali language) which grew abundantly in this area and were seen even in 1900. The suffix *guri* means "a place". The name might as well be associated with Jalpesh temple, with the presiding deity Shiva, which has been well known and in the minds of people there from time immemorial.

The Jalpaiguri subdivision of Rangpur, so named since 1854, was co-terminous with the earlier Sukhani subdivision and it was the nucleus of the district formed in 1869. The local name of a place like Jalpaiguri, which happened to be the seat of a military cantonment, thus gave first its name to the subdivision and then to the district. Earlier in March 1849, Hooker had arrived at "*Jeelpigoree*", which was then 'a large straggling village near the banks of the Teesta, a good way south of the forest' and at this place according to him, 'we were detained for several days, waiting for elephants with which to proceed northwards' *(Gruning J.F., 1911)*. Naturally, "*Jeelpigoree*" was then a point of trans-shipment in an area covered by forests.

The present district consists of the Western Dooars since 1865 and the Jalpaiguri and Rajganj thanas of Rangpur district since 1869. The district so formed on the 1st of January 1869 is bounded in the North by the Darjeeling district and Bhutan, in the East by Assam, in the South by Rangpur district in Bangladesh and Cooch Behar district and in the West by Darjeeling district and part of Bangladesh. The district lies between 26° 16' and 27° 00'N latitude and between 88° 04' and 89° 53'E longitude *(District Statistical Hand Book, 2004)*.

The long international border with the countries of Bhutan and Bangladesh has made Jalpaiguri, a strategic location so far as the defence, development and economy of this region are concerned. Besides, being the largest district in the northern part of the State of West Bengal, with an area of 6227 square kilometre, this district with a population of 34,03,204 *(Census Report, 2001)* is the house of

many tribes and communities Toto, Rava, Mech among others, the abode of a variety of birds and animals, including the rare "clouded leopard", the land of 188 rivers, rivulets and vast, verdant forests. It is the largest tea producer of the State with 158 established Tea Estates. It also possesses Asia's best dolomite reserves in the Dooars *(Allen B.C., et al., 1906, Kusari A.M., et al., 1981, Mitra A., 1951, Milligan J.A., 1919, Roy B., 1969, Sunder D.H.E., 1985).*

Despite these advantages, the district suffers from many problems. The district has a profuse store of ground water; practically the entire district is a 'white zone'. Still, there is a drinking water crisis in some remote areas and hardly 30% of the water-reserve is utilised. Absence of proper storing facilities to take care of maximising the economic value of surplus vegetables, impedes the growth process altogether. Poor irrigation and routine flash floods hamper food production and escalate the flood control budget simultaneously. Illiteracy, low energisation, lack of sanitation, deforestation, poor marketing facilities, absence of exposure to modern technologies, uncontrolled transformation of agri-land to tea-gardens, growing unemployment in rural and urban areas, especially in the tea gardens, are the other deterrents to the developmental process.

The district has a vibrant cultural life with the many cultures contributing to its multi-textured life. Administratively, the district is divided into three sub-divisions, four municipalities, thirteen blocks (Panchayat Samities) and one hundred and forty six Gram Panchayats *(Map 1.2).*

2.2 Geology

Geological foundations of the district consist of Precambrian slates, schist, phyllites, dolomites, quartzite, gneisses, lower Gondwana and Siwalik sandstones and recent to sub-recent alluvium. Geologically the area is important because Coal, Dolomite deposit and enormous deposits of construction materials such as gravel sand, brick earth, etc *(Chattopadhyay G.S., Das A., 1992).* The district is entirely underlain by alluvium except its northern border where hard rocks are exposed. The northern part of the district experienced widespread development of alluvial fans.

The fluvio-glacial deposit of the quaternary period has been widely dissected by the rivers. It is drained by innumerable south and southeast flowing rivers amongst which, Mahananda, Teesta, Jaldhaka, Torsa, Raidak and Sankosh are noteworthy. Frequent flooding, bank erosion and avulsion are endemic environmental problems, causing heavy damage to agriculture, forests, tea gardens, communication and settlements.

2.3 Physiography

Physiographically, North Bengal is a region of diverse and complex area, exhibiting a wide variety of landforms. Their genesis, mode of formation and morphological forms are diverse in nature. Geomorphologic history of North Bengal was characterised by successive catastrophic events of accelerated deposition during the post-Pleistocene period. Physiographically, North Bengal may be divided into 3 major divisions namely the hills, the piedmonts and the plains.

2.3.1 The Hills

The hilly region of Jalpaiguri district is restricted within its extreme North-Eastern part at Buxa area along the international border between India and Bhutan and is bounded by the 300 metre contour line. The lesser Himalayas run East to West direction within this region. These are only four small fragments of the mountainous region in the East, which is situated along the Northern border of Jalpaiguri district. The Jainti-Sinchula range (700-1600 metre) is situated in this region. The hills rise abruptly from the piedmont plain (120-300 metre) and the elevation increases Northwards upto 2000 metre at the Sinchula ridge. Within these, there is a mosaic of micro-topographic units comprising convex ridges and deep-cut valleys.

2.3.2 The Piedmonts

The Piedmont or sub-Himalayan zone is locally known as Dooars. It covers the tilted plains at the base of the Himalayas bounded by the 300 metre contour line to the North and 66 metre contour line to the South. It includes the entire Northern

half of Jalpaiguri district. This is formed due to the coalescing of several alluvial fans within the catchment area of the major rivers like Teesta, Jaldhaka, Torsa, Kaljani, Raidak and Sankosh. Rivers and streams which have cut gorges have also given rise to terraces, across the undulating and low plateau like drift deposits thereby, forming a typical landscape, overlooking and often merging with the plain to the South.

2.3.3 The Plains

The Plain region of Jalpaiguri district is bounded by the 66 metre contour to the North and the Southern territorial boundary of the districts. Perceptible gentle gradient of land is a significant feature of the active zone. Rivers flow through meandering courses and floods are common during the rainy months. Bed load is deposited close to the channel and suspended load with finer silt and clay accumulates in back swamp areas away from the river channels.

2.4 Drainage

There are a large number of rivers and rivulets originating or passing through the district of Jalpaiguri. There are often flash floods in different regions of the district mainly on account of rain fall in the source regions of the five major river systems of the district apart from rainfall in the district itself.

The flash floods which occur due to heavy rainfall often inundate large tract of lands through which these rivers flow. It is because of the enormity of the problems that the several flood control works undertaken by the Irrigation and Water ways Department over the years have not substantially reduced the threat of flood which, every year causes loss of life and damage to property.

The flood problems in Jalpaiguri originate from:

1. Heavy floods caused by intensive rainfall.
2. Sedimentation and changes in river regime.
3. Runoff water spilling over the river banks.
4. Bank erosion, meandering tendency of the rivers.

5. Soil erosion in upper catchment areas and its deposition in lower regions.

After the devastating floods of 1954 and 1959 the issue of effective flood management in the district of Jalpaiguri received attention it deserved at State and National level. According to the recommendations of this high level committee on floods 1957 constituted by Government of India, the Flood Control Master Plans for the rivers Teesta, Torsa, Jaldhaka, and Raidak were prepared by the Irrigation and Waterways Department, Government of West Bengal between 1968 and 1977. These master plans stressed on the need of tackling the flood problems by taking basin of each river as an unit. They recommended, inter alia, treatment of hilly catchments of rivers by construction of check dams at a number of places, afforestation to same soil mantle on the hill slopes and reduction of the chances of landslide, gradual stoppage of shifting cultivation and controlling of indiscriminate destruction of forest cover *(Sanyal C.C., et al., 1970, Sarkar S., 2007, Sarkar S., 2008).* Based on the recommendations of master plan, the Irrigation and Waterways Department in North Bengal has so far built 333 km of flood embankments in Jalpaiguri district.

2.5 Climate

The climate of Jalpaiguri District is noteworthy because of its position, the powerful effects of the South Western monsoon against the Himalayan barrier and the peculiar configuration of the ridges and valleys which deflect or allow rain-bearing winds that affect local temperature and rainfall. Seasons of Jalpaiguri District are found to be dominated by two seasons: cold and rainy. However, two more relatively short spanned seasons i.e., spring and autumn are also noticed.

Climate of Jalpaiguri district is characterised by hot and humid condition. The mean maximum temperature is 31.6^0C and the mean minimum temperature is 21.3° C. Mean annual rainfall is 3466 mm. Occasional high intensity rainfall in catchment areas causes devastating landslides and flood. Ground water table is situated fairly nearer to the surface in the district except the Northern part. Ground

water table stays within a depth of 2 to 10 metre during the summer except Northern part. Though water resource potential is enormous, so far, irrigation facilities tap only a minimal fraction of this resource.

2.6 Soil

The soil of Jalpaiguri district is characterised by its coarse texture, low water retention capacity, acidic in reaction (5.1 to 7.3) and poor in organic matter (0.5 to 2.2%), nitrogen (0.03 to 0.20), phosphorous (29 to 40 kg/hectare) and potassium (100 to150 kg/hectare).

The alluvial fans of the piedmont plains at the base of the mountains are principally accumulation of the coarser materials of heavy mountain wash, e.g., boulder, gravel, pebble, sand, etc. This soil is deep and coarse at the base of the mountains. It is azonal soil with low percentage of organic carbon, pottasium oxide, phosphorous pentoxide and acidic in reaction.

Soil texture changes towards the South, along the floodplains of the large rivers, comprising the Southern part of Jalpaiguri district. Soil pH increases as one proceeds towards the South. Soil texture is relatively coarse towards the North but finer towards the South at Cooch Behar. The soil is mostly acidic (5.0 to 6.5) in reaction due to excessive leaching. The pottasium oxide, phosphorous pentoxide contents are also low in most places, however, higher amount has been found at isolated pockets of the districts.

2.7 Natural Vegetation

About 24% of the total geographical area of Jalpaiguri district is covered by forest. Sal is gregarious but it is found in mixture of a varying proportion of the following species like *Terminalia, Chkraisa tabularis, Lagerstroemia parviflora, Amoora rohiruka, Careya arborea* etc. Riverine forests are found in sandy soils near the river beds. Most important among this type are *Acacia catechu* and *Dalbergia sissoo* forest found along the beds of all major rivers in the piedmont zone. Wet mixed forest is found in the relatively low lying and dampened areas with

better edaphic condition, includes *Machilus spp. Listsaca spp., Cryptocarya spp. Cinnamonum spp, Actiondaphne spp, Meliosma spp. Eugenia spp.* etc. Dry mixed forest with the dominating species being *Terminalia, Gmeline, Sterculla, Terrameles premna spp. Machilus spp.* etc. is found along the interfluves of the major rivers of the district *(Champion H.G., Seth S.K., 1968, Chowdhury A.B., 1966).*

The tremendous forest resources, unfortunately, do not play a very significant role in the economy of the district. This is because much of the forest resources are out of bounds for the common man. The plethora of forest rules and acts and Honourable Supreme Court rulings preclude the easy exploitation of forest resources even in a sustainable manner. This was perhaps necessary from the point of view of managing the environment but, environment cannot possibly be managed by ignoring the realities and conditions of the people living in and around the forests. While people living outside the forest areas cannot derive any economic benefit from the rich forest areas, the approximate one lakh people living in the 77 forest villages (about 3% of the district population) do not derive much economic benefits from the forests either. Living in abject poverty, segregated from the main stream of the district life, denied the basic facilities such as education and health, these forest villagers are eking out a miserable existence.

The Forest Department has tried to reduce their misery by constituting forest protection committees and eco-development committees but these people have largely been bypassed by the Panchayat Raj Institutions and all other Government delivery systems. The Forest Department desires to relocate these people from the forest areas to outside the forest areas, say the forest fringes. This has not worked out except for a few pockets. For this to succeed, there has to be sufficient incentive to enable these tradition-bound people to move away from the land tilled by their fore-fathers. One way to solve the problem perhaps is, to extend all facilities to these villagers. If the Government delivery mechanisms cannot reach these villagers, the help of NGOs *(Appendix-III)* can be taken. An experiment is already underway in the 11 forest habitations in the Buxa area where a NGO, with Government help,

launched "Buxa Siksha Jyoti Abhiyan" aimed at providing primary education to the children in these villages. The gains from this experiment need to be consolidated and replicated across other similarly placed villages. Of course, we also have to add better and effective health services to these downtrodden forest villagers quickly.

To provide a choice of livelihoods to these marginalised people which do not harm the forests is important. The Forest Department, for example, can consider encouraging these villagers to go in for fodder and fire wood cultivation in the vacant spaces. Cultivation and collection of medicinal plants can also be a very sustainable livelihood for these people. **At the same time, to ensure their food security, whatever land is being cultivated by these forest villagers should be made more productive through increased access to new technology and provision of irrigation.** In fact, increased agricultural productivity and increased number of crops in a year particularly in the forest villages and the villages in the forest fringe-areas can substantially reduce the adverse impact of human habitations close to the forests due to obvious reasons.

Jalpaiguri district was always known for timber. Due to the onslaught of nature, human beings, sustained campaign of environmentalists and the orders of the Honourable Supreme Court, felling of trees for timber is no more a viable activity for a large section of the population who used to depend on this in the past. While, an embargo on felling of trees has reduced employment opportunities for the people in the forest villages and the forest fringe areas, it has also, in a way contributed to the growth of illicit felling of timber. It must be understood that the felling of trees contributes not only for making furniture but also using wood as fuel. Since the forests are major assets and attraction of Jalpaiguri district, comprehensive strategy has to be in place to preserve them while offering adequate income generating opportunities to the people. Since a large proportion of the population still depend on wood for fuel and fodder plantation must be developed in every village to cater to the requirements of the stakeholders and society at large. For structural timber, wherever possible, the rural population must be encouraged to take up tree

plantations outside forest areas. To enable Jalpaiguri district to survive, the forests too must survive. However, forests can not survive without the people depending on forests live a healthy and fruitful life.

2.8 Demography

As per the 2001 Census, the total population of Jalpaiguri is 34,03,204 of whom 17,53,278 are males and 16,49,926 are females. In 1991, the corresponding figures were 28,00,543 (total), 14,53,194 (males) and 13,47,349 (females). These represent a net increase of 6,02,661 over the last decade. In percentage term basis, this is an increase of 21.5%. As per the 2001 Census, the SC population was 12,48,577 which is 36.69% of the total population and the ST population was 6,41,688 which is about 18.86% of the total population. Thus, together they constitute 55.55% of the total population. The distribution of the SCs and STs in the district is not uniform and while the STs primarily populate the tea gardens and forest villages which are more in the Northern half on the district, the SCs are more evenly distributed across the district particularly in the Southern parts.

In terms of literacy, the Census 2001 figures display that the total number of literates in a district is around 18.389 lakh, of whom males constitute 10.998 lakh and females constitute 7.391 lakh; in percentage terms 73.64% of the male population is literate and 52.90% of the female population belongs to this category.

The Human Development Report 2004 of West Bengal places Jalpaiguri in the 10^{th} position so far as the overall ranking of the districts in this State is concerned *(West Bengal Human Development Report, 2004)*. This has been assessed mainly on the basis of health index, income index and literacy index. The report also states that so far as the delivery mechanism in infrastructure assets is concerned, this district is somewhat backward compared to a number of districts in the State. The report further states that the Jalpaiguri district has relatively high rates of poverty in both rural and urban areas with low per capita consumption evenly spread across rural and urban areas. Thre rural poverty ratio as per the above report is 35.73% and the Human Development Index value is 0.53.

2.9 Conclusion

The study area thus composed of several tectonic units of the Sikkimese-Bhutanese Himalaya overthrusted towards South which are built of metamorphic rocks. The foreland of the Himalaya is built of Quaternary sediments which show a distinct fractional differentiation starting from boulders and gravels in the root part of piedmont fans and terraces, at distance of 5-10 kilometre from the margin turning to sand and farther downstream to sandy loam and silt.

Geomorphologicaly, the study area is diverse and complex in nature, exhibiting a wide variety of landforms. Their genesis, mode of formation and morphological forms are diverse and have been characterised by successive catastrophic events of slope wash on the hill slope followed by accelerated deposition along the piedmont during the post-Pleistocene period.

Topographically, Jalpaiguri district may be divided into 3 major divisions namely the hills, the piedmonts and the plains. The hills rise abruptly from the piedmont plain from 120 - 300 metres and the elevation increases Northwards up to 2000 metre at the Sinchula Massif. Within these, there is a mosaic of micro-topographic units comprising convex ridges, intermountain valleys, high terraces and deep-cut valleys. The piedmont covers the tilted plains at the base of the Himalayas bounded by the 300 metre contour line to the North and 66 metre to the South. Perceptible gentle gradient land is a significant feature of the plains.

The climate of Jalpaiguri district is characterised by diversities in rainfall and temperature pattern between its Northern and the Southern parts. Mean annual temperature ranges from cool condition in the Himalayas to 26° C to the plains. Precipitation also exhibits similar kind of diversity that ranges from less than 3000 mm along the Southern margin to over 5000 mm along the Northern piedmont. Extreme diversity in geological set-up, topographic forms along with climatic elements exhibits unique biodiversity in the study area. The climate is uniform throughout various blocks of the district.

The district produces a huge quantity of surplus fruits and vegetables. The lack of cold storage and marketing facilities are major impediment to the growth of this sector. On the other hand, these factors influence unwarranted transformation of agriculture-land to tea gardens, which again face lower acceptability in the international market. Despite profuse reserves of ground water, some parts of the district are facing drinking water crisis. Jalpaiguri district has always been deficit in its basic need of food grain production. To produce more food and to bring more lands under agriculture, creating more irrigation facilities is a must. Deforestation has been a great menace. People virtually eking out on poor agriculture depend on forest produce and forest has been the surrogate source of income.

2.10 References

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