Chapter: 2

Murshidabad: A Brief Profile

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2.1 Location and Geographical extent:

Murshidabad district, geographically extends longitudinally from 88°46′0″ E to 87°46′17″ E and latitudinally between 23°43′30″ N and 24°50′20″ N covering an area of 5,324 sq. km (Fig 2.1) (**District Census Hand Book** 2001). It occupies the central plain of the state of *West Bengal* and is surrounded by *Malda* in the north, *Barddhaman* in the south, *Nadia* in the south-east and *Birbhum* in the west. The state boundary between *West Bengal* and *Jharkhand* lies in the north-west. In the north-east and east, it shares the international boundary between *India* and *Bangladesh*. *Berhampur* is the district head quarter located in the central part and at the flank of River *Bhagirathi*. The district came into existence long before independence (**Banerjee** et al. 2003, **District Census Hand Book** 2001). Currently, it has divided into five sub divisions namely *Kandi, Lalbag, Jangipur, Sadar* and *Domkal* and twenty six blocks- *Hariharpara, Berhampur, Domkal, Beldanga-I, Beldanga-II, Nawda, Jalangi, Samsherganj, Suti-I, Suti-II, Sagardighi, Raghunathgunj-I, Raghunathgunj-II, Farakka, Kandi, Burwan, Bharatpur-I, Bharatpur-II, Khargram, Raninagar-I, Raninagar-II, Murshidabad-Jiagunj, Lalgola, Nabagram, Bhagawangola-I* and *Bhagawangola-II* (Fig 2.1). There are seven municipalities (*Dhulian, Jangipur, Jiaguanj, Ajimguaj, Murshidabad, Kandi, Beldanga* and *Baharampur*).

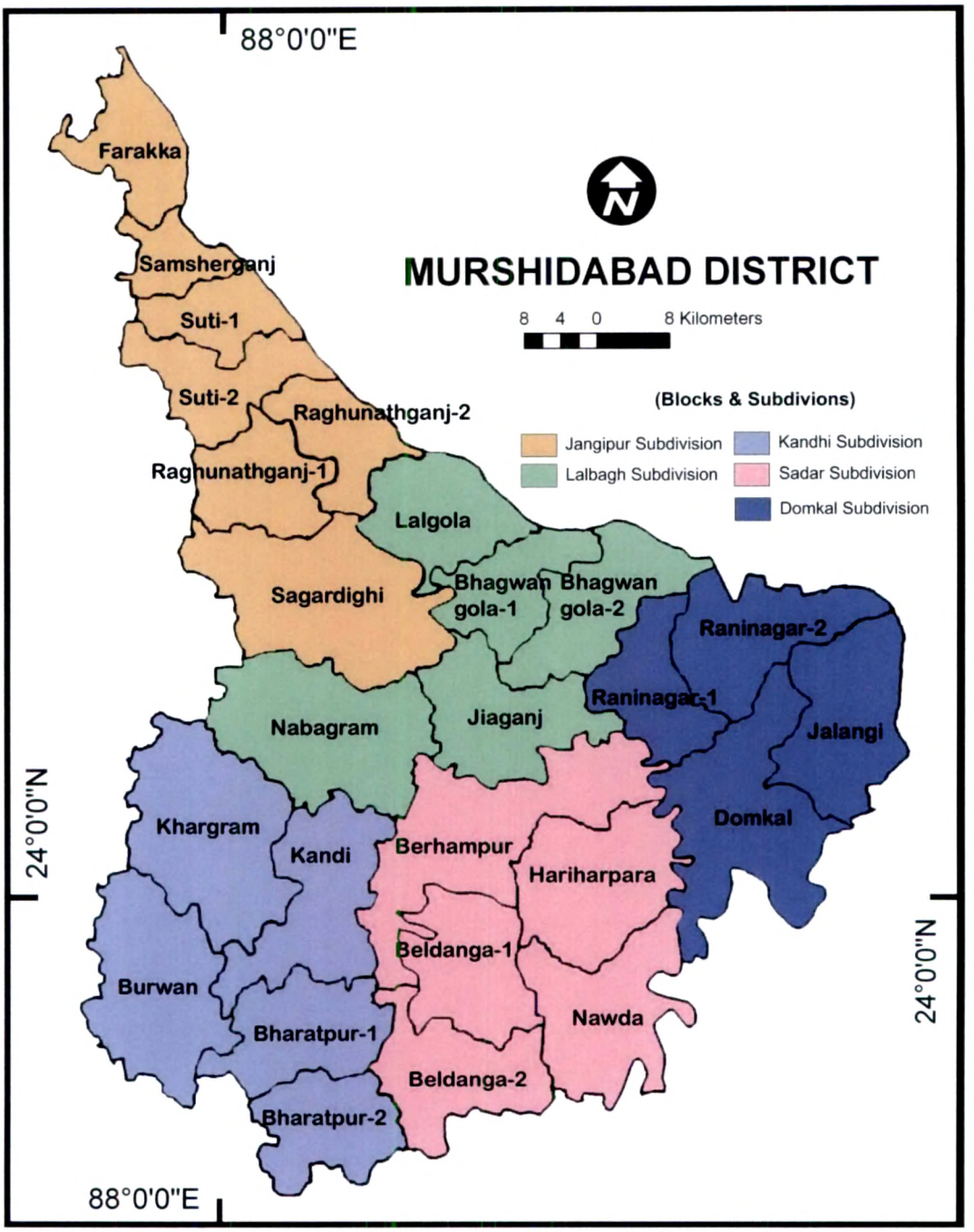

Fig. 2.1: Blocks and Subdivisions map of Murshidabad District (Source: DCBH, 2001)

There are 26 police stations, 26 Panchayet samities, 255 gram panchayets and 2210 villages in whole of the district. From the point of view of tourist's attraction, the district has several important places of historical significance. One of the points of attraction is *Hazarduari*. It is the last palace of *Nawab Bahadur* in *Murshidabad* and is situated on the bank of River *Bhagirathi*. *Sripur Palace* of *Kasimbazar*, District library at *Kashimbazar*, Textile Technology Institute and *Berhampur* Fort (Fig 2.2) are few other places of attraction. There are numerous temples situated across the district and are of religious, tourist and archeological significance (**District Census Hand Book**, 2001, **Banerjee** et al. 2003).

Fig. 2.2: Berhampur Fort (1850) Artist: W. Purser, Engraver: W. J. Cooke, Source: http://murshidabad.net/

Long back in 5th century AD, *Gupta's* ruled the northern part of present day *Radh* and *Begri*. In 7th century AD King *Sasanka* had ruled over whole of the *Radh* region. In present time, *Murshidabad* took a significant twist when Murshid Kuli Kha (Fig 2.3) was appointed as the faujdar of the district (*Makshudabad*) and Dewan of *Bengal* by the *King Aurangzeb*. The district derived its name from the name of *'Murshid Kuli*

Fig. 2.3: Nawab Murshidkuli Kha. Source : http://murshidabad.net/history/ showimage-img-murshid-quli-khan.jpg

Kha'. The present *Murshidabad* came in to existence in 1787 as part of *Birbhum* district. The final form of the district of *Murshidabad* came into existence through jurisdictional interchanges with *Birbhum* in 1879 and after that there has been changes in the boundaries of the district.

2.2 Physical Setup:

2.2.1 Physiography and Geomorphology:

The entire district is plain with elevation varying between 10-50 m above mean sea level (**District Resource Map**, 2008). Hence, the district is prone to floods during the monsoon season. Topographically, the study area is further classified into five micro regions-

1. ***Nabagram Plain*** - slopes gently towards east with low lying area in the north,

2. Mayurakshi-Dwarka Plain - is located in the southwestern part of the district and has the characteristics of *Radh* and is associated with *Sub-Vindhyan* region.

3. ***Ganga-Bhagirathi Basin*** - extends in the narrow valley of *Ganga* and *Bhagirathi* and is highly fertile and suitable for cultivation.

4. ***Jalangi-Bhagirathi Interfluve*** - extends between River *Bhagirathi* in the east and *Bhairab* in the west and River *Jalangi* in the south-east.

5. ***Raninagar Plain*** - is associated with *'Begri'* region and has numerous swamps, extends between *Bhairab* and *Jalangi* Rivers in the north-eastern sector (**District Census Handbook**, 2001).

2.2.2 Geological Settings:

The whole district is associated with the unconsolidated sediments of the late Pleistocene to late Holocene time. Quaternary sediments mainly belong to *Rampurhat, Kandi* and *Bhagirathi* formations whereas older formations belong to *Rajmahal trap.*

Western part of River *Bhagirathi* is dominated by *Rampurhat* formations having sandy and silty clay. *Kandi* formation is extensively spread over the district with alternating layering of sand, silt and clay sediments (Fig 2.4) (**District Resource Map** 2008, **Groundwater Information Booklet** 2007).

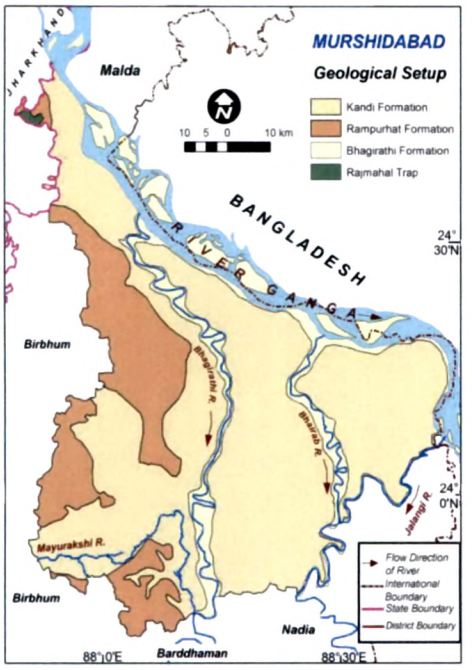

Fig. 2.4: Geological Settings of the Study Area (Source: District Resource Map, Murshidabad, West Bengal, 2008)

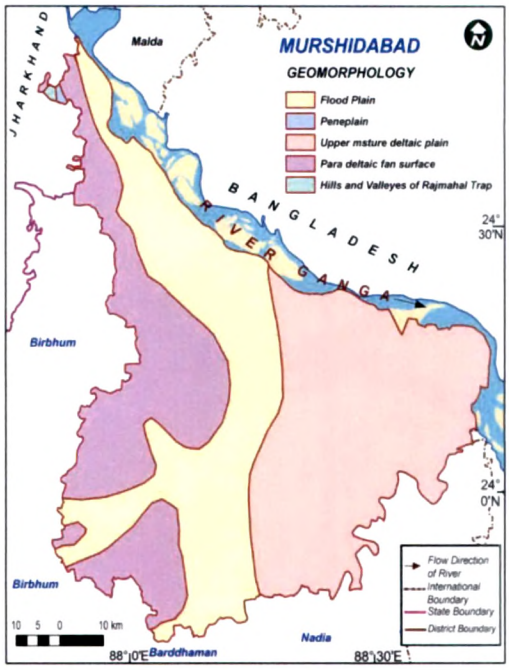

Fig. 2.5: Geomorphic Settings of the Study Area (Source: District Resource Map, Murshidabad, West Bengal, 2008)

The *Bhagirathi* formations, also contain silt and clay and are associated with present day fine grained flood plain regions. A small patch of *Rajmahal trap*, associated with basaltic rock is situated in the north-western part of the district.

2.2.3 Drainage:

The major river of the district is *Ganga* and its distributaries like *Bhagirathi, Bhairab* and *Jalangi*. The river flows from north-west to south-east along the northern flank of the district. Large bars and meandering is noticed in the upper reach, whereas, the lower reach is characterized by large meandering pattern with narrowed channel close to eastern part. River *Bhagirathi*, flows in north-south direction in meandered

path with numerous ox-bow lakes. The river approximately divides the entire district into two halves.

(**District Resource Map** 2008, **Groundwater Information Booklet** 2007, **District Census Handbook** 2001). River *Bhairab* flows in north-south direction in a meandered path on the east of River *Bhagirathi*. River *Jalangi* flows nearer to *Bangladesh* and meets river *Bhairab*. It follows the path in the south-east and marks the district boundary between *Murshidabad* and *Nadia* (Fig 2.6). In the southwestern segment of the district, a small part of river *Mayurakhi* enters the district from *Birbhum* district of *West Bengal*. All the distributaries carry considerable amount of water only during the monsoon season.

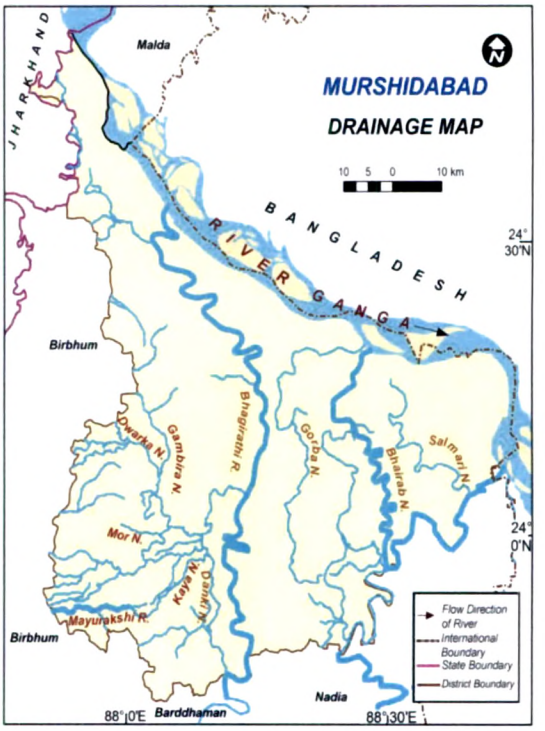

Fig. 2.6: Drainage of the Study Area (Source: District Planning Series Map, Murshidabad, West Bengal, 2002)

There are several other smaller rivers which drain the district. *Bansloi* is an important tributary of *Bhagirathi*. It enters the district from *Birbhum* district of *West Bengal* and after flowing in the eastward direction it meets River *Bhagirathi*. In the south of *Bansloi*, another small tributary of *Bhagirathi* known as *Pagla*, flows in

Fig. 2.7: A Bil near Berhampur

the same direction and meets the river.

Apart from rivers, several smaller ponds and tanks locally known as *'bils'* are found in the eastern part of the district. 129 sq. km of the area in the south-eastern part of the district is swampy. These *'bils'* are mostly used for fish production and for irrigation (Fig. 2.7). Even in the district head quarter of *Murshidabad*, there is a big tank known as '*Sagardighi*' (**District Census Handbook**, 2001). Some of the important *'bil's* are as follows-

1. ***Hijal bil*** is located in the south-western part of the district. Major parts falls in the block of *Kandi* and some part comes in *Berhampur* also. The average depth of the *'bil'* is not more than 4-5 feet but during rainy season it increases to 20 feet.
2. ***Telkar bil*** is located in the western part of river *Bhagirathi* near to *Khagda* railway station. Recently the *'bil'* is filled up and used for irrigational purpose.
3. ***Basiar-bil*** is located in the block of *Nabagram* with a perimeter of 15 kms and touches >50 villagaes.
4. ***Motijhil bil*** is located in the south-east of *Murshidabad* city. It is an ox-bow lake which is formed due to change in the path of river *Bhagirathi.*
5. ***Gobornala*** is a small channel of river *Bhagirathi* and is located in it's the eastern side the channel is the result of the excess of river water.

Patan, Baloler, Mundmala, Damos, Ahiron, Telkar and *Ahikar* etc. are the other important *'bils'* in the district.

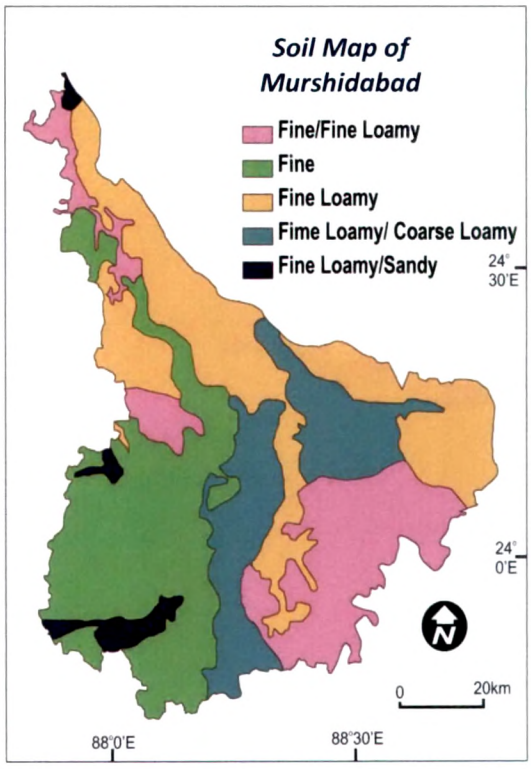

Fig. 2.8: Soil Map of the Study Area (Source: NBBS & LUP Regional Centre, Kolkata, http://agricoop.nic.in/Agriculture%20contingency%20Plan/West%20Bengal/WestBengal%2011-Murshidabad-31.12.2011.pdf)

2.2.4 Soil:

The eastern segment of the district which is on the east of the river *Bhagirathi* is associated with fertile light alluvial soil locally known as '*bagri*' (fine loamy and sandy) while western part of river *Bhagirathi* has lateritic clay and calcareous nodules and continuation of sub-*vindhyan* region, locally known as "*Rarh*" (fine loamy). The characteristics of the soil are light texture, low organic carbon content and slightly acidic in nature. (**NBBS & LUP Regional Centre**, Kolkata, **District Planning Series Map,** Murshidabad, 2002) (Fig. 2.8).

2.3 Climate :

The climate of the district is hot and humid. Rainfall mainly occurs from the southwest monsoon. Average rainfall of the district is about 1400-1700 mm and 74% of it falls between June and September only. Mean monthly temperature varies

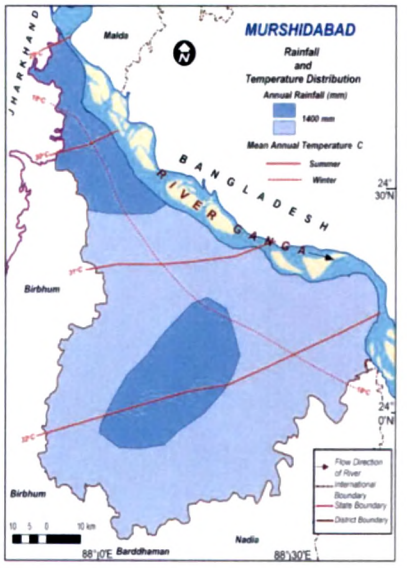

Fig. 2.9: Rainfall and Temperature Distribution of the Study Area (Source: District Planning Series Map, Murshidabad, West Bengal, 2002)

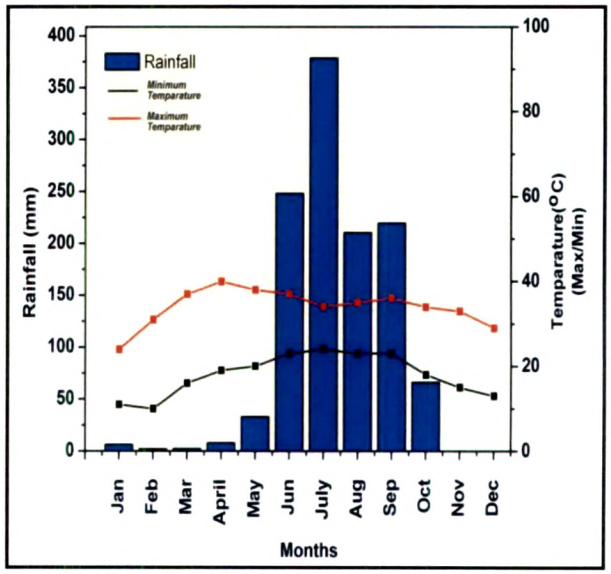

Fig. 2.10: Rainfall and Temperature 2008
Source (Rainfall): http://www.imd.gov.in/ webrain/ wb/murshidabad.txt
Source (Temperature): http://www.wbagrimarketingboard.gov.in/maxmintemp/maxmintemp_murshidabad.html

between 17°C to 35°C. May is the hottest month with 46C highest recorded temperature. Thunderstorm, hailstorm and heavy rain associated with dusty gust are commonly observed during early summer season.

This convective type of storm in the evening time is locally known as "*Kal – baisakhi* " (**District Census Handbook** 2001). December and January are the winter months, January is the coldest month with minimum temperature between 9°C to 11°C and maximum of 25°C (Fig. 2.9 and Fig. 2.10).

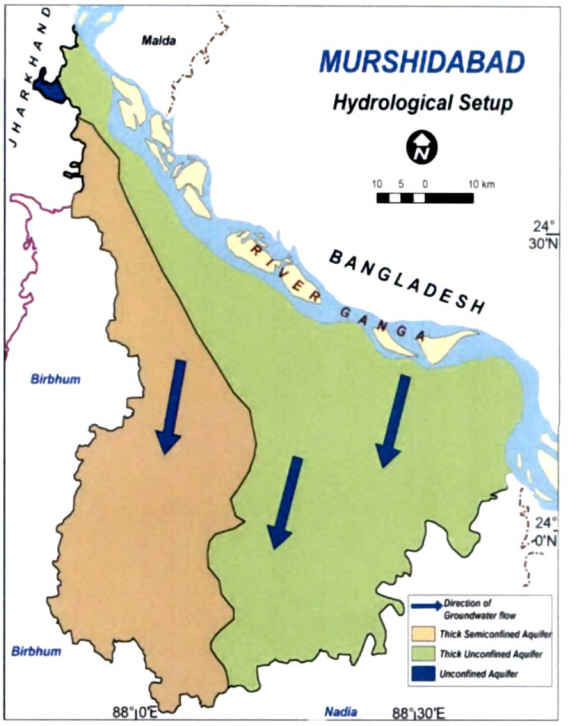

Fig. 2.11: Hydrological Setup of the Study Area (Source: Groundwater Information Booklet, Murshidabad, 2007)

2.4 Aquifer Condition:

Three types of aquifer system are found in the entire district-

i) Eastern segment of river *Bhagirathi* is associated with thick unconfined aquifer. In this aquifer is that no significant impermeable layer between surface and subsurface layers due to which interaction of water from the surface is more frequent and with greater intensity.

ii) The western part the district is associated with thick semi confined aquifer. This aquifer is partly confined by the layers of lower permeability materials. Under confined condition the clay beds are connected with each other and resulted into artesian condition in several places (**Groundwater Information Booklet,** Murshidabad, 2007).

iii) In the north-western tip of the district a small patch of unconfined aquifer composed of basaltic rock is found (**District Resource Map** 2008, **Groundwater Information Booklet** 2007). In the eastern part of the district groundwater saturation zone is extended upto 150 m due to absence of any major obstacle. Generally, water table is found within 2-5 m below the ground level throughout the district (Fig. 2.11). General subsurface flow of water is towards south and potential of groundwater (>42 yield l/s) (**Groundwater Information Booklet** 2007) is in the east and southern part of the district.

2.5 Vegetation:

Deltaic environmental type of vegetation is dominant and bamboo is found everywhere in the district. *Bot, Aswatha, Sal, Segun, Mahua, Mango, Jackfruit* are usually found. Mangoes are mainly found in the eastern segment of the district. In the blocks of *Berhampur, Islampur* and *Beldanga, Mulberry* is grown. Other than these, *Plum* and *Babla* are also found extensively. Forest products are mainly used for timber and fuel. According to the census of 2001, whole of the district accounts for just 8 sq. km forest cover which is only 0.15% of the total geographical area (**Banerjee** et al. 2003).

2.6 Socio-Economic Setup:

2.6.1 Demographic Setup:

According to 2011, the district has a total population of 7,103,807 with 51% males and 49% females. Between 2001 to 2011, population of the district grew by 21.07%. Sex ratio in the district is 938 females per thousand males. About 80% of the total population lives in rural areas (**Census** 2011). In terms of child sex ratio it is about 968 girls per 1000 boys. Density of population increased from 1101 in 2001 to 1334 person per sq. km. in 2011. The average literacy rate has increased from 54.35% to 67.53% in the last decade.

2.6.2 Agriculture and Irrigation:

Paddy and jute are the major crop of the district. Wheat, oilseeds, pulses, jute and potato are some of the other important crops (**Murshidabad.net** 2013, **District Census Hand Book**, 2001). In the last few decades, the production of jute has increased to almost twice. Vegetables are grown three times in a year and a fourfold increase has been observed in the last three decades.

The district depends upon irrigation throughout the year, except for the monsoon season.

Fig. 2.12: Agricultural Activities in Murshidabad

2.6.3 Industry:

The district basically relies on agriculture hence no major industries are developed. Silk is one of the important products of the district which holds a significant position in the economy. Mulberry cultivation and silk worm production, peeling of silk and its weaving are developed in the district. Historically, silk of Murshidabad district is

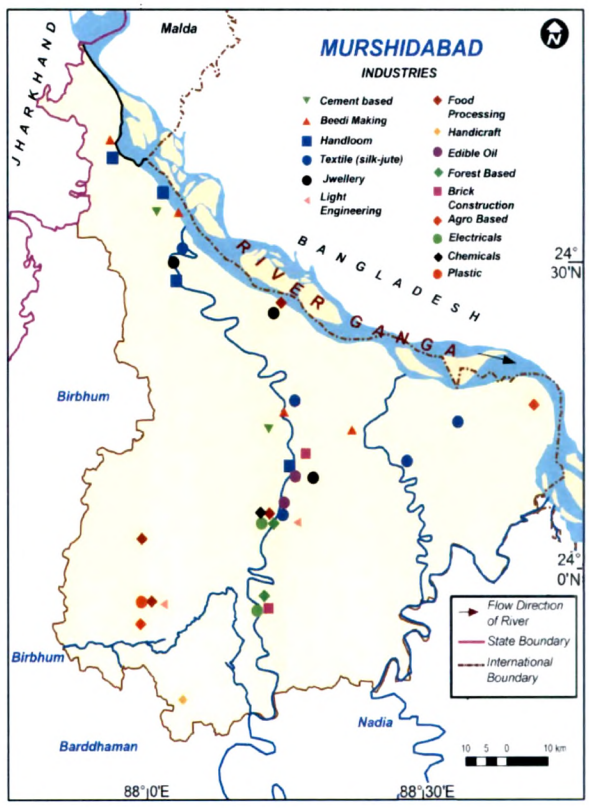

Fig. 2.13: Industries of Murshidabad District (Source: District Industrial Centre, Murshidabad and District Census Handbook, Murshidabad, 2001)

well developed (**Mookherjee** 1990). Due to the influence of *East India Company* it got a major thrust. But after industrial revolution in *England*, Murshidabad district received a major setback due to the availability of cheaper and more durable machine made textiles (**Mookherjee** 1990). This adversely affected the production but it continued to be an important source of economy. Small scale industry of ivory craving in *Khagra* and *Jiaganj* is also an important economic activity since the time of Nawab. In *Samshergunj* and *Suti* blocks thousands of families are engaged in *'Beedi'* manufacturing (**District Census Handbook** 2001) (Fig. 2.13). Other than silk, *Khadi* and *Muslin* industry of the district also holds a very significant position. Among 280 active *Khadi* societies in *West Bengal*, 96 are located in Murshidabad district. Khadi cloth and apparel are even exported. The district is also associated with several small scale home based industries like jute products, ornament making, manufacturing and polishing of brass utensils and ivory products (**Banerjee** et al. 2003).

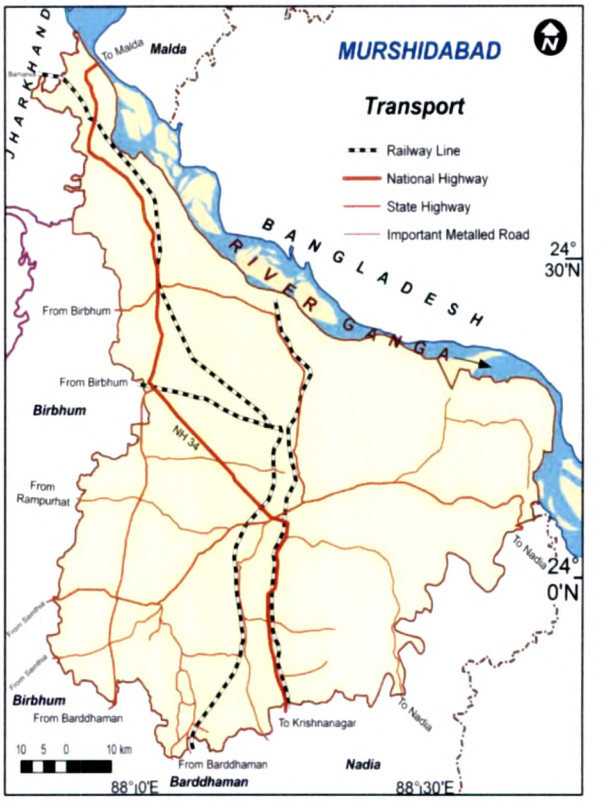

Fig. 2.14: Transport Map of Murshidabad District (Source: District Census Handbook, Murshidabad, 2001)

Farakka thermal plant supplies electricity to the whole of the district. Presently, five units of the thermal plant are engaged in commercial electricity generation (**District Census Handbook** 2001).

2.6.4 Transport and Connectivity:

The district is well connected by national and state highways. National Highway (NH) number 34 passes through the district connecting *Kolkata* in the south and *Siligiri* in the north. After entering the district near *Raginagar*, it passes through *Beldanga, Baharmapur* and *Farakka* blocks and enters *Malda* district.

Major state highway in the district is Morgram-Panagrah Super Highway. Till 1905, Ajimgunj-Nalhati was the only rail line in the district. Later, Ranaghat-Bhagawangola rail line was laid. Presently, the longest rail line in district is Badhadoa-Ajimgunj-Katoa line of which 137 km lies in the district (Fig.2.14).

2.6.5 Water Facility:

River *Ganga, Bhagirathi* and *Bhairab* are the major source of irrigation. Groundwater is used for of drinking as well as for irrigation. The extraction of groundwater is largely done by hand pumps, shallow tube wells and dug wells (**Ravenscroft** et al. 2009). There are numerous ponds and tanks in the district but still dependency on the groundwater is notably high due to the shallower groundwater table and high potential. Government has paid attention towards establishment of deep tube wells in the municipal as well as in the rural areas. (**Bhattacharya** et al. 1997, **District Census Handbook** 2001).

2.7 Arsenic in Groundwater:

Murshidabad district lies in the central alluvial plain of *West Bengal* and is associated with the problem of natural arsenic contamination of groundwater (**Acharyya** et al. 2007). Direct consumption of arsenic contaminated water through drinking as well as its use in the agriculture through irrigation is related to serious health issues. (**Díaz** et al. 2004, **Huang** et al. 2006, **Williams** et al. 2006).

2.8 Land Use/Land Cover Pattern of the district:

The entire district is dominated by the agricultural land. An area of 3969.66 sq. km area is associated with agriculture which is about 74.56 % of the entire study area. Agricultural fallow land comprises an area of 31.79 sq. km while agricultural land related to plantation is having an area of 52.21 sq. km which accounts for 0.60 % and 0.98 % respectively. Wetlands/water-bodies/rivers/streams and canals all together encompasses an area 6.25 % of the total area (Fig.2.15). Wetland/reservoir and lakes has the total area of 29.02 sq. km which is 0.55 % of the total area. The deciduous forest is associated with an area of 5.51 sq. km while forest plantation land is only 1.12 sq. km. The built up area of rural area and urban area is 793.02 sq. km and 93.28 sq. km respectively (14.90 % and 1.75 %). The barren/uncultivable land and wasteland is only about 3 sq. km.

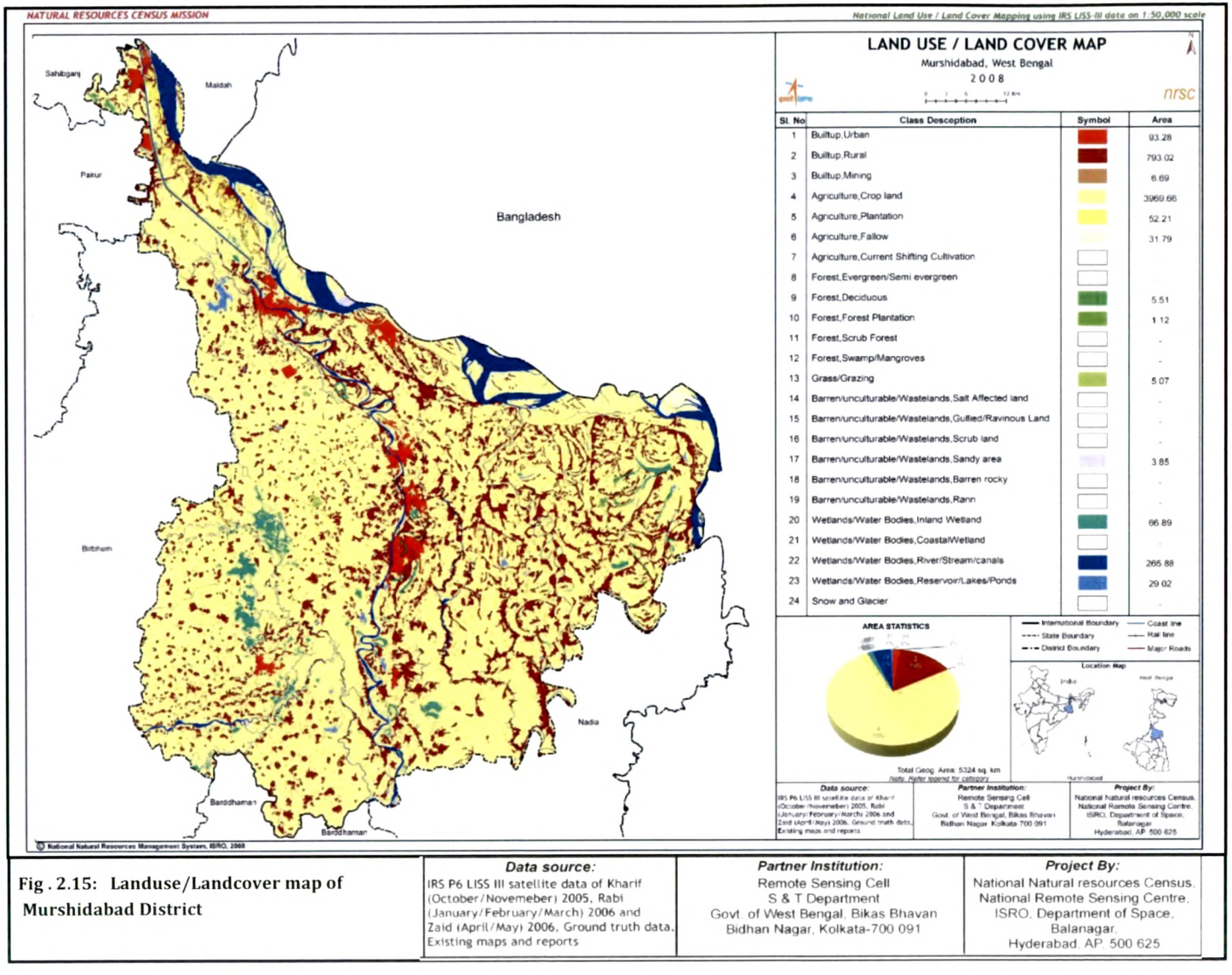

Fig . 2.15: Landuse/Landcover map of Murshidabad District

Data source:	***Partner Institution:***	***Project By:***
IRS P6 LISS III satellite data of Kharif (October/Novemeber) 2005, Rabi (January/February/March) 2006 and Zaid (April/May) 2006, Ground truth data, Existing maps and reports	Remote Sensing Cell S & T Department Govt. of West Bengal, Bikas Bhavan Bidhan Nagar, Kolkata-700 091	National Natural resources Census, National Remote Sensing Centre, ISRO, Department of Space, Balanagar, Hyderabad, AP. 500 625

Resume:

The present chapter illustrated the physical and socio-economic condition of *Murshidabad* District of *West Bengal*. The district is almost plain and drained by river *Ganga* and its distributaries like *Bhagirathi* and *Bhairab*. The entire district is associated with thick alluvium soil with considerably higher amount of precipitation. Agriculture is the major economic activity along with silk, beedi and agro based industries. The next chapter focused upon the spatio-temporal characteristics of groundwater of the district.