

*Chapter 04: Study area*

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#### 4. STUDY AREA:

The targeted study area includes Paschim Medinipur district situated in south-west part of West Bengal state, India (coordinated of 22°15'N 87°39'E). It is having very vast and diverse geography and rich sociocultural status. That ranked second largest of total area consist 9295.28 km<sup>2</sup> after the South 24-Parganas which have 9960 km<sup>2</sup>. It stands third and fourth so far the rural population (4.58 million) and tribal population percentage (14.87) is concerned among West Bengal districts. National Highway (NH) namely NH-14 and NH-16 cuts the district into two natural divisions. Flat, fertile, alluvial soils reside on the east side of the road and undulating, infertile laterite soil is on the west. Dry deciduous forest persists in the west region while marshy wetlands are in the east part. The alluvial portion is also divisible into two vital parts. One near to Hooghly and Rupnarayan river, intersected by many rivers and associated watercourses. Remaining of the eastern half is water logged filled with rice culture plain and intersected by various waterways and tidal creeks.

Both flood and drought are observed in selected part of Paschim Medinipur. Flood prone zone includes Ghatal and portion of Kharagpur subdivision with a total area of 1426.47 km<sup>2</sup> and destroys crops of Pingla, Sabang, Narayangarh Community Development Blocks etc. and drought prone areas include Jhargram and Medinipur sub-division with an area of 3352.48 km<sup>2</sup>.

The study area includes 4 subdivisions and total 29 Community Development Blocks (CDB). Kharagpur Subdivision includes Dantan-I, Dantan-II, Pingla, Kharagpur-I, Kharagpur-II, Sabang, Mohanpur, Narayangarh, Keshiari, Debra, Midnapore Sub-Division consists of Midnapore Sadar, Garhbeta-I, Garhbeta-II, Garhbeta-III, Keshpur, Salboni, Ghatal Sub-Division consists of Chandrakona-I, Chandrakona-II, Daspur-I, Daspur-II, Ghatal, Jhargram Sub-Division consists of Binpur-I, Binpur-II, Jamboni, Jhargram, Gopiballavpur-I, Gopiballavpur-II, Nayagram, Sankrail (Fig. 01).

There is a population of 59,43,300 and ranked 14<sup>th</sup> among 640 districts in India. Population density per square kilometer is 636 individuals; population growth rate was 14.44% over decade 2001-2011, where male and female sex ratio is 1000:960 and literacy rate was 79.04%.

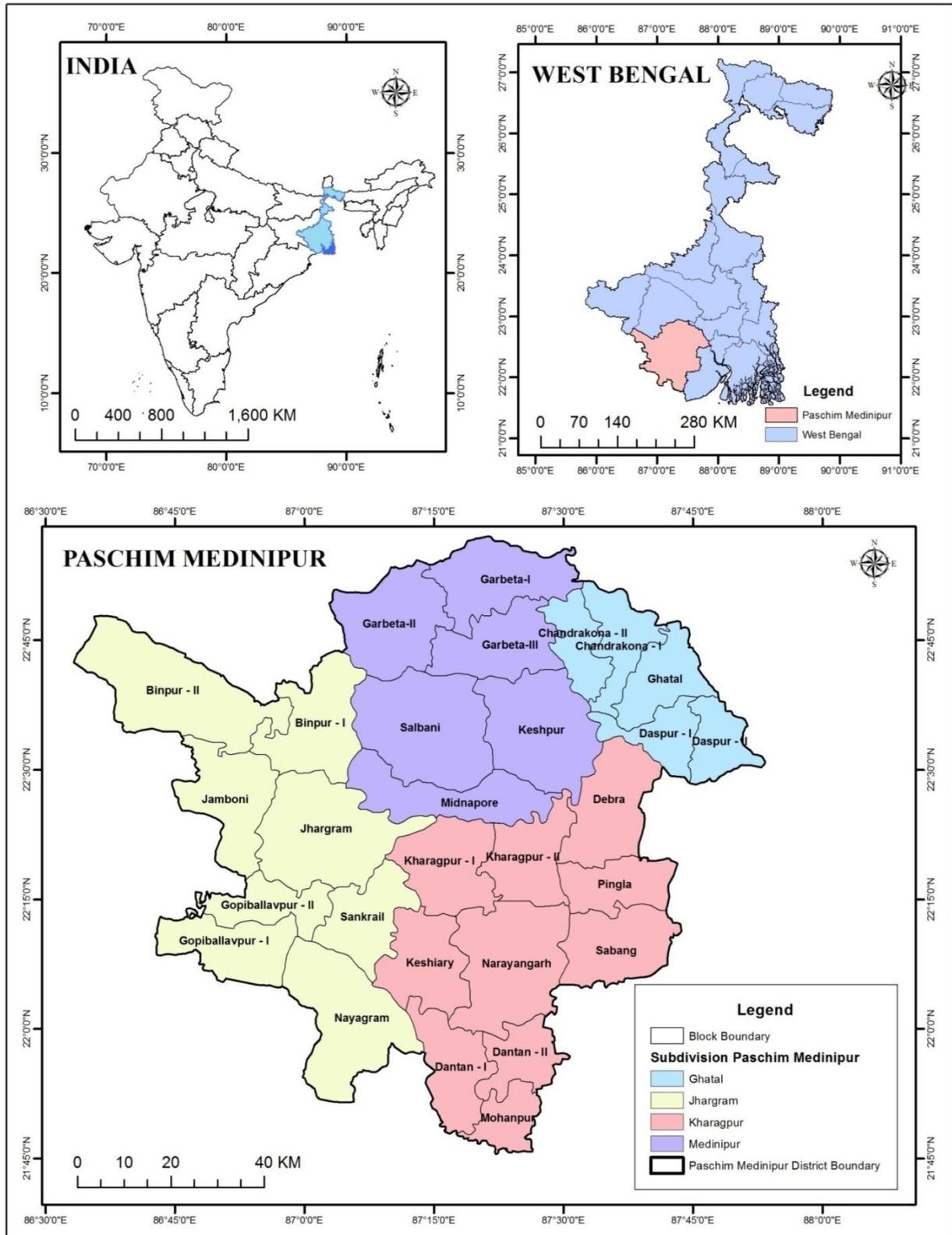


Fig 01: Study site location and its subdivisions

Paschim Medinipur District has the 2nd highest area (9368.00 sq km) in West Bengal State. The main work force of the district comes from cultivators and agricultural labourers. They are 22.8% and 44.0% of total workers respectively. There are 1094 uninhabited villages in Paschim Medinipur. In case of the river network distributions, there are four major river systems flowing through this district, viz, Hooghly, Cossye, Runarayan and Subarnarekha. The district has three geographically distinct regions namely Planes of Shilai, Lower Kansai Planes, and upland of Medinipur, planes of Shilai is in the north of this district and considers a part of eastern Chotonagpur plateau. The river Shilai flows through Purulia and Garbeta-II block. Alluvial deposition brings flood in Daspur-I and Ghatal blocks in rainy season. In this geographical area, Garbeta-I and Garbeta-II blocks, some portion of Binpur-I block, Chandrakona-I and II blocks, Ghatal, and some portion of Daspur-I block are included.

Lower Kansai Plane covers both side of the Kansai River. Some portions covered by eastern part of Rupnarayan, which is a natural marking of Medinipur (undivided) district. Ebb and flow remain very active in this specified region. It is long and depressed area. This triangular, depressed region is formed with delta plane of Kansai and Shilai rivers. Due to gradual alluvial deposition, navigability of this river is totally lost. A huge depression is formed in the west and north-west area on the Kansai and Keleghai confluence and causes flood situation and is known as “Moyna basin”. Diffusing feature of the Kansai is one of many reasons behind it. Places like Binpur, Jhargram, Salboni, Medinipur, Kharagpur, Keshpur, Ghatal, Daspur, Panskura, Moyna, Debra, Bhagwanpur, Pingla, Nandigram, Tamluk, Sutahata, Dugrachak and Haldia are included in this plane.

Upland of Medinipur covers partially the Chhotonagpur plateau and formed with lateritic soil. In the extreme north, some hills can be seen, which are 82 mt. to 223 mt. in height. The land sloping is from north-west to south-east part. Some rivers meet the flow of Kansai in the north, and some of them meet the Subarnarekha. Dulung is the major river in this region which is originated in Binpur and meets Subarnarekha in Sankrail Block. The Subarnarekha may be known as the controlling river of this upland region. This river flows from Bihar and entered into Gopiballavpur-I CDB in this district. It forms a natural border between Bengal and Odisha in western region of Dantan-I block.

The soil of western region is dry, non-fertile and unsuitable for cultivation CDBs like Binpur-I & II, Gopiballavpur-I & II, Jhargram, Jamboni, Sankrail, Keshiary, Dantan-I are totally or

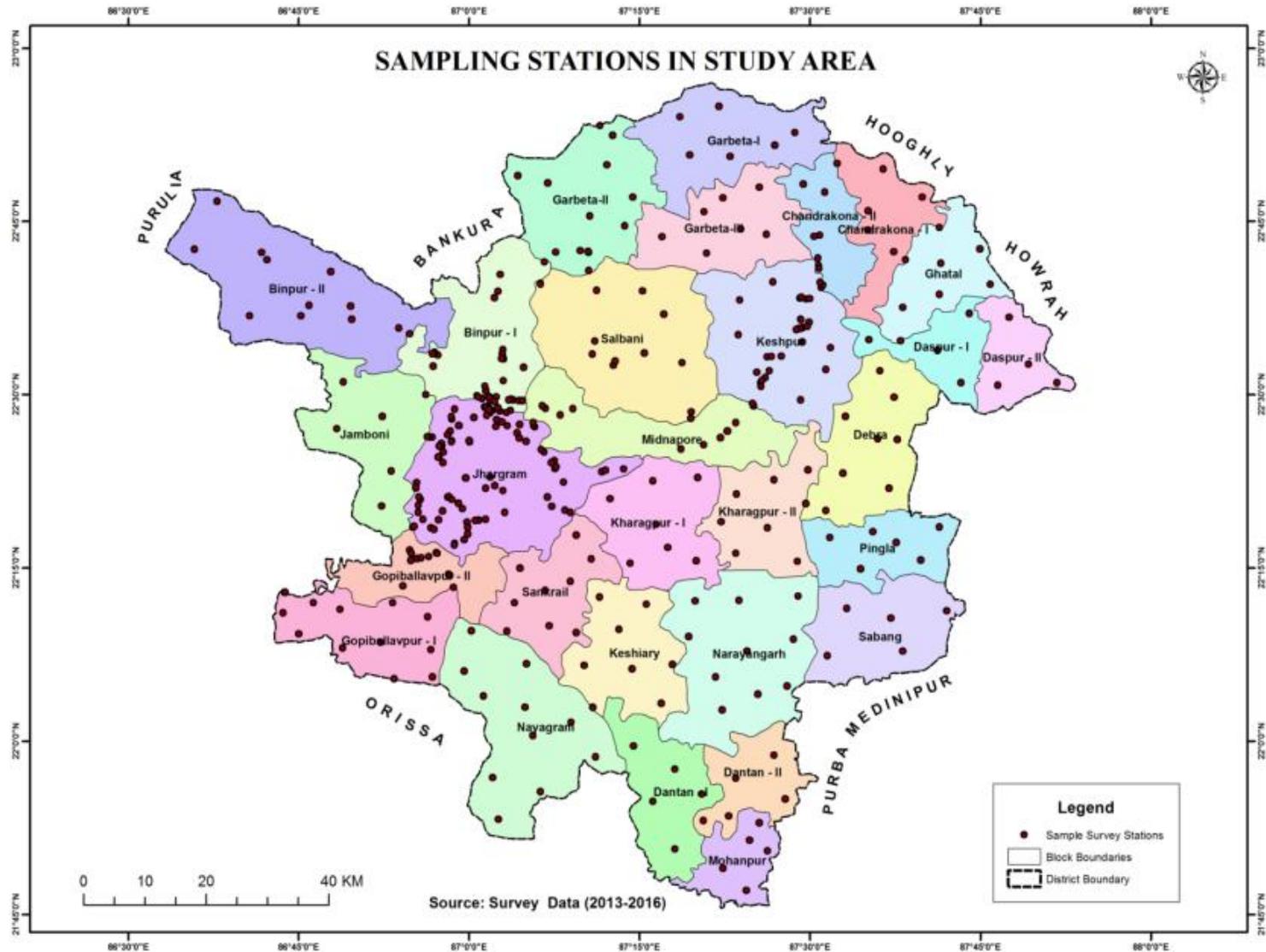


Fig 02: Sampling stations in the Community Development Blocks of Paschim Medinipur district.

partially included in this region. Midnapore is located at 22.424°N 87.319°E and is 23 meters above sea-level.

The climate persist here is hot tropical monsoon. Summers exist from April to mid of June month. Monsoon rains exist from mid of June to August; sometimes extend to September with rains due to southeast monsoon. Winters exist from December to January, but may be extended to February month. Soil type near Kangsabati river are alluvial with a high amount of clay or sand, and the soil near Rangamati are lateritic. Vegetation includes eucalyptus and sal timber forests. The winter is classified Aw (winter dry season). Average temperature in Paschim Medinipur is 26.8 °C and average rainfall is 1436 mm per year (Köppen and Geiger, 1928) .

More than 80% of population resides in villages and lead their life based on small agro based industries. The major crops are paddy (Aus, Aman & Boro), wheat, potato, oilseeds, vegetables, pulses, sugarcane, jute, betel vine, matstick etc. and minor crops includes Maize etc.

Net cropped area in Paschim Medinipur is approximately 595210 ha. The experience of drought and flood are common in this district and sometimes one is followed by another in a year. Flood prone area covers an area in approximately 142647 ha (Ghatal and portion of Kharagpur Sub-Division) whereas drought prone area covers 335248 ha (Jhargram Sub-division, Kharagpur Sub-division, Medinipur Sub-Division). The average rainfall in this district is about 1541.6 mm (mean of 29 years). Rainfall recorded 1224.9 mm in 2012 and 1920.2 mm in 2013 (2016).