

Physical Set-up and Agricultural Condition after Independence - A case study on Murshidabad District, West Bengal, India.

Iman Sk

Assistant Teacher in Geography

Vivekananda Palli Kishore Bharati High School, Behala, Kolkata

ABSTRACT

Agriculture is the process of producing food, feed, fiber and many other desired products by the cultivation of certain plants and the raising of domesticated animals (livestock) that controlled by the climatic condition, nature of topography and socio economic demands of any area. Agricultural pattern is perhaps the clearest indicator for the management and modification of natural environment into cultural environment. The present paper is an attempt to analyze physical set-up and agricultural condition after independence - a case study on murshidabad district, west bengal, india and also to explore the agricultural production of land with different natural and socio-economic parameters for sustainable development. Based on the block wise secondary data obtained from the Bureau of Applied Economics and Statistics, Govt. of West Bengal, I prepared the soil coverage mapping of the area that shows the cropping pattern of study area. The results show that jute is the main agricultural production than others agricultural production. In 2015-16 total production of jute is 1939800 tonne, where paddy and wheat productiona sre 1120900 tonne and 285600 tonne. However, a planned agricultural pattern is suggested considering demographic change of the region.

Keywords: Topography, soil type, drainage, agriculture pattern and GDP.

INTRODUCTION

Agriculture, as the backbone of Indian economy, plays the most crucial role in the socioeconomic sphere of the country. Indian agriculture is a diverse and extensive sector involving a large number of actors. It has been one of the remarkable success stories of the post independence era through the association of Green Revolution technologies. The Green Revolution contributed to the Indian economy by providing food self-sufficiency and improved rural welfare. The role of national agricultural research system (the NARS) was imperative in the context of Green Revolution. Often, the most overlooked aspect for the agricultural development is physical setup of the any place or region. The agricultural condition as well as the agricultural productions are dependent of well physical set up, likely plain land topography, well drainage facilities, fertile soil composition, suitable climatic elements, viz temperature, rainfall, humidity and wind flow. Where physical conditions are well, there agricultural development or agricultural production is good from the ancient period. If the agricultural production is well, then socio-economic development of any region to

country is better than, as well as GDP value, HDI & GDI value, Happiness index value is good. To understand the trends of agriculture share in GDP of economy and to analyze and present the Public expenditure incurred by the government before and after reform period in Murshidabad district.

METHOD

STUDY AREA

Murshidabad district is a district of West Bengal, in eastern India. Situated on the left bank of the river Ganges and extends from $24^{\circ}50'20''$ N to $23^{\circ}43'30''$ N and $88^{\circ}46'$ E to $87^{\circ}49'17''$ E covering an area about 5342 sq. km. (District Census Handbook, 2011). The district has 26 blocks or tahsils. It borders West Bengal's Malda district to the north, Jharkhand's Sahebganj district and Pakur district to north – west, Birbhum to west, Bardhaman to the south-west and Nadia district due south. The international border with Bangladesh Rajshahi division is on the east.

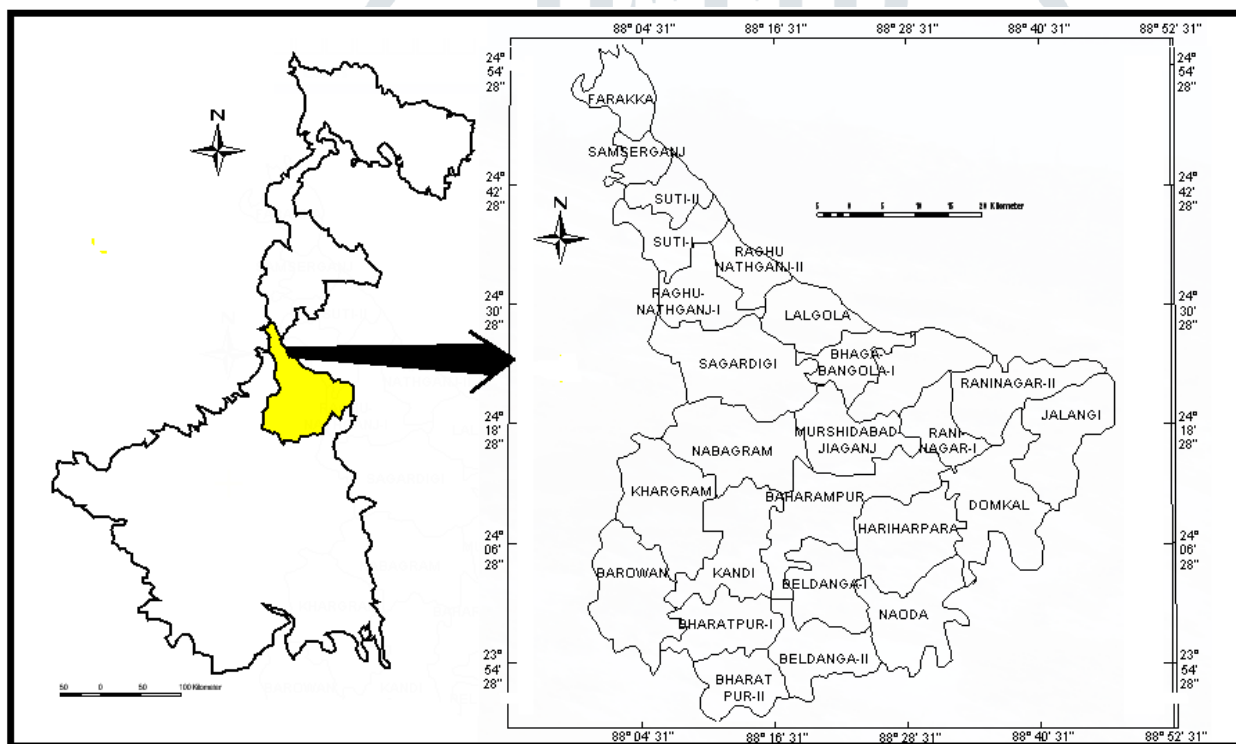


Figure No. 1: Location of the study area.

DATA ANALYSIS

This paper is based on the secondary data obtained from the census of India. Block is taken as a unit of study, for analysis and mapping purpose. Data thus collected, interpreted and represented cartographically by using choropleth map technique. Here, represent the choropleth map of the study area in block wise for analysis the nature of topography and also the spatial pattern of soil types in Murshidabad district. The main data source of this study is annual action plan 1986-87, pp9-10, district annual action plan, principal agricultural office, 1985 and C.M.O.H. Office, Murshidabad and the Office of the Director, Bureau of Applied Economics and

Statistics, Govt. of West Bengal, various books, articles etc. The data taken from Census and used MS Excel and Geographical Information System (GIS) Software for analysis the cartographical presentation the block-wise proportion of area under different soil types and also the data has been calculated to show the change that is taken place after independence.

RESULT AND DISCUSSION

Topography of Study Area on the Basis Bench Mark Value

Here the bench mark value of study area has been provided on the basis of internet information, this value shows that the Murshidabad district’s altitude from mean sea level is 17 metres to 58 metres . The highest value found in Barowan block, which is situated in Ruhr region but minimum B.M. value are found in Bagri region. Here provide a Murshidabad map on the basis of block wise bench mark values.

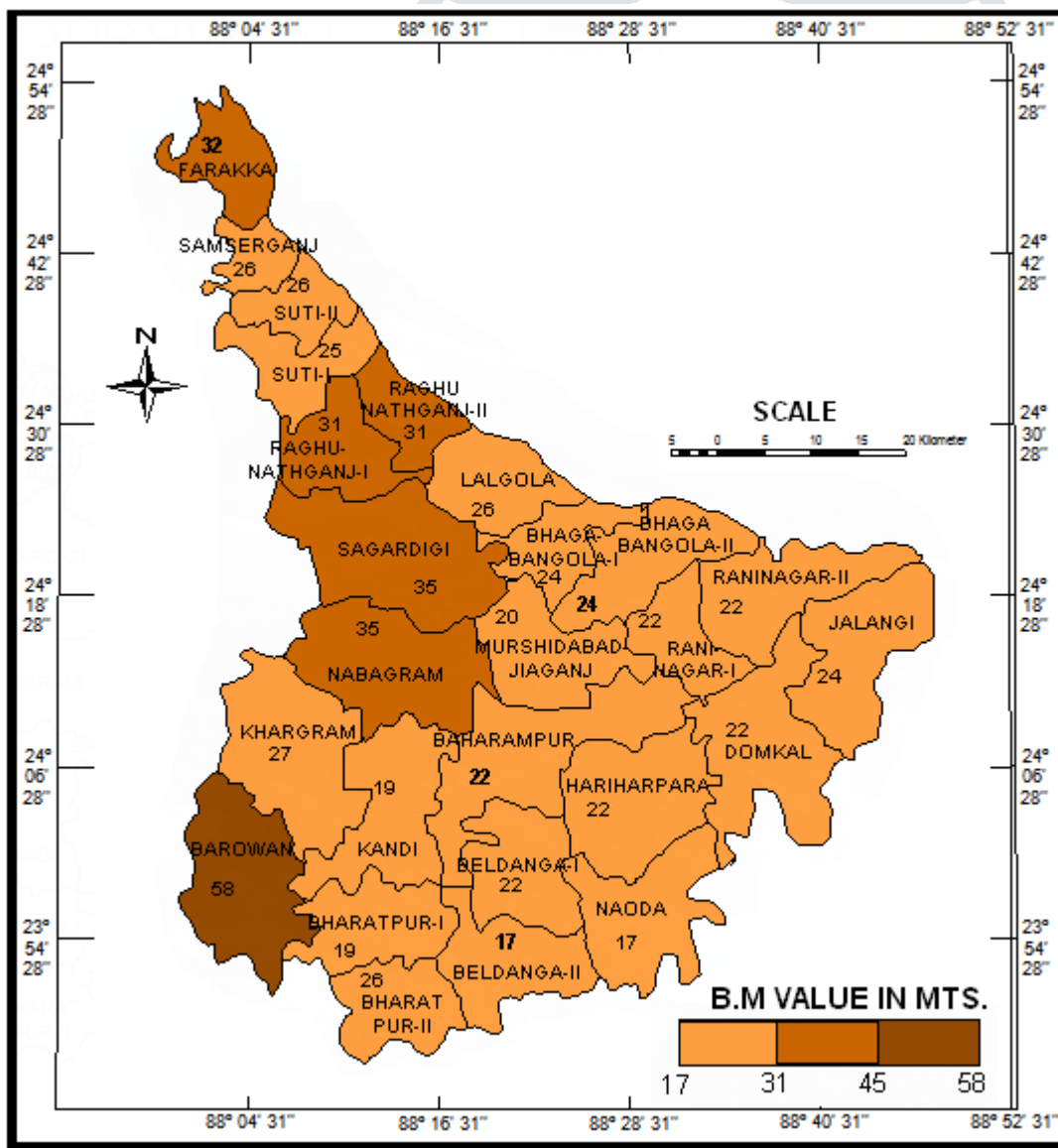


Figure No. 2: Bench mark map of Murshidabad District (Compiled by the author on the basis of internet based data)

Topography and Agricultural Pattern

Beside historical importance, the district 'Murshidabad' has occupied a distinctive position in the 'Agriculture Map' of the State of West Bengal as because the soil, weather & climate of this district permit multiple cultivation. In fact, the river Bhagirathi has distinctly divided this district into two zones viz. 'RARH' and 'BAGRI' which are situated on the Western and Eastern sides of the river Bhagirathi respectively. The structure and texture of soil of two zones are also different. The soil of RARH is mostly clay and lateritic clay type, comparatively heavy, gray or reddish in colour. The land is high and slightly undulating having gentle slope from West to East. The soil of the area is generally low in carbon content and acidic to neutral in reaction. The main crops are paddy, potato but oil seed and vegetables are cultivated successfully in all the three seasons.

On the other hand, the soil of BAGRI is mainly alluvial type with comparatively light texture, low in organic carbon content and soil reaction is slightly acidic to neutral. The principal crops are Jute, Paddy, etc. The district is well-drained by a number of rivers and rivulets. The important rivers amongst them being the Ganges and its tributaries namely the Bhagirathi, the Jalangi and the Bhairab. The Ganges first touches the district at its extreme northern point and flows almost due South-East and then gets bifurcation into two major streams, viz. Bhagirathi & Padma at Nurpur. The Bhagirathi which branches off from the Ganges flows from North to South dividing the district into almost two equal parts. The Jalangi start its courses in the Jalangi Police Station area on the East of the district & Bhagirathi branches off from Padma in the Lalgola Police Station area. The river Mayurakshi enters the district through Kandi Sub-division. It is worth mentioning that the Bhagirathi which had become non-navigable has been made navigable again with the construction of Farakka Barrage.

Soil

The 'rarh' region is substantially a continuation of the sub- Vindhyan region of lateritic clay and nodular ghutting. The soil is grayish or reddish mixed with lime and iron oxide and scattered nodular lime ghutting (kankar). The 'bagri' region lying in the Bhagirathi recent surface has little soil development. The surface composed of loose and completely unconsolidated sediments exhibiting a variety of sedimentary structures. About 1-2 meters of thick brown mottled soil with soft and incipient ferruginous concretion develop on Younger Deltaic Plain. The soil pH ranges from 6.7 to 7.4. The soil groups of Murshidabad district classification was done by the agricultural department in annual action plan 1986-87.

Table no.1 Soil Combination in Different Block of Murshidabad District

Block	Predominant groups of soil	% total area	Other groups	% total area
Berhampore	Clay, loam	80	Sandy loam, Silty loam	20
Beldanga-I	Sandy clay, loam, sandy loam	65	Loam, clay loam, silty clay loam	35
Beldanga-II	Sandy clay, loam, sandy loam	65	clay loam, loam, silty clay loam	35
Hariharpara	Clay, loam	85	Sandy loam	15
Nowda	Clay. loam	97	Sandy loam, silty loam	3
Domkal	Sandy loam	97	Clay, silty loam	3
Jalangi	Loam. Silty loam, silt	60	Sandy loam, silty clay clay	40
Murshidabad - Jiaganj	Loam, sandy loam	55	Clay, clay loam	45
Lalgola	Clay loam, loam	70	Silty clay loam	30
Bhagawangola-I	Loam, silty	55	Clay loam, silty clay loam	45
Bhagawangola-II	Silty loam	55	Clay loam, silty clay loam	45
Raninagar-I	Silty loam, silty clay loam	82	Clay, loam, sandy, clay, loam	18
Raninagar-II	Silty loam, silty clay loam	82	Loam, sand, clay loam, clay	18
Nabagram	Clay loam	75	Clay, loam, silty clay loam, silty Loam	25
Kandi	Clay loam, loam	65	Sandy loam, silty loam, clay	35
Khargram	Loam, clay loam	80	Clay, sandy, clay loam	20
Burwan	Clay, clay loam	90	Loam, silty loam	10
Bharatpur- I	Clay, clay loam	82	Loam, silty loam, sandy loam, Sand	18
Bharatpur- II	Clay, clay loam	82	Silty loam, sandy loam, loam	18
Raghunathganj-I	Clay loam 95	95	Loam, silty loam, sandy loam	5
Raghunathganj-II	Loam, sandy loam	55	Clay loam, sandy loam, loam silty loam	45
Suti-I	sandy loam	80	Clay, Loam, clay loam	20
Suti-II	Sandy loam, clay	80	Loam, clay loam	20

Samsarganj	Clay loam, clay	60	Sandy loam	40
Farakka	Clay loam, clay	85	Sandy loam, loam, silty loam	15
Sagardighi	Clay loam, loam	67	Sandy, sandy clay, Sandy loam, sandy clay loam	33

Source: Re-tabulated and redrawn by the Author from annual action plan 1986-87, pp9-10

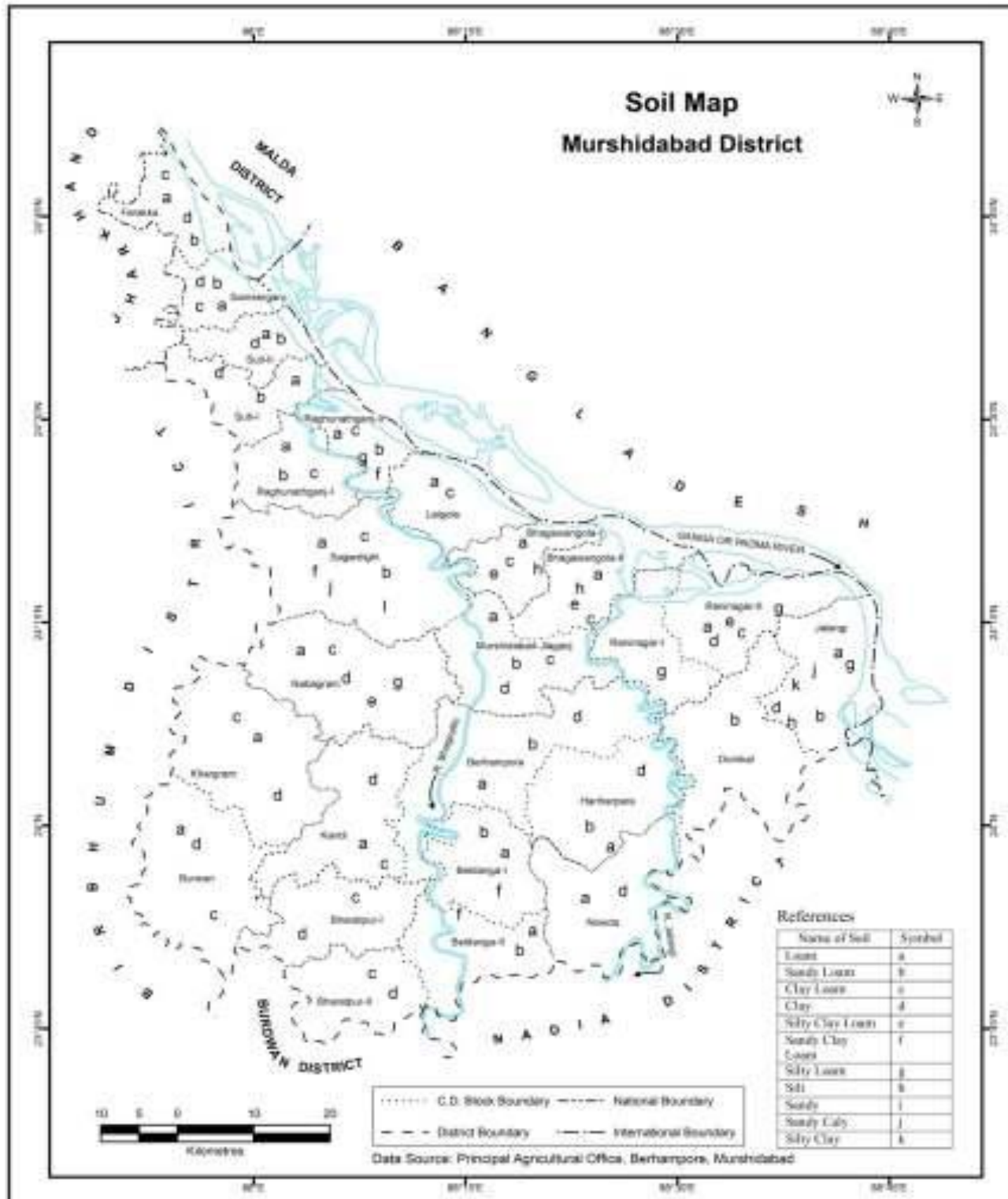


Figure No. 3: Soil map of Murshidabad District (Compiled by the author from District Annual Action Plan, Principal Agricultural Office, 1985).

The above table no 1 show that soils of Murshidabad are mainly resultant depositional action of the Ganges and its tributaries in the 'bagri' region while in the 'rarh' the soils were deposited from other rivers of sub-Vindhyan range. The morphology indicates that the soils of 'bagri' have not formed at a very distant date. Fine sand and silt predominate throughout the depth. The clayey soil is mixed with loamy soil making good water holding capacity in soil. Occasional salty patches impart a whitish colour to the soil. The soil contain low amount of potash and phosphate, and poor in organic matter and nitrogen. The permeability of the soil is very high and the soils have good drainage capacity.

Sen, J. 1988; had proposed a soil classification of the 'bagri' region adopted from the Directorate of Agriculture (1958-60) as:

a) Ganga Riverine lands (Meadow soils) – i) Inundated phase- Ganga Char lands: This region is found in the adjacent to the banks of the Ganga- Padma River and Jalangi River. ii) High land phase – Ganga ridges: these regions occurs beside the inundated phase; comparatively in the highest topography.

b) Ganga Flat land: This land lies between Ganga riverine and Ganga lowland. The nitrogen content is moderate and the buffering capacity is very high. Water permeability and water retention capacity is very high. The percentage of sand decreases and the percentage of clay increases with the depth of the soil.

c) Ganga Lowland: This zone is associated with heavy clay horizon followed by subsoils of sandy material, coarse sand and some concretions. During rainy season the soil is sticky and during winter the soil dried up and cracks. The percentage of silt, moisture, carbon and nitrogen decreases with the depth of the soil.

d) Ganga Uplands: The area has comparatively higher topography. The Bhagirathi rarely swings to the right and erode the land due to the stable and stiff nature of this soil. The soil profile is clayey in nature with the presence of lime horizon. The sesquioxide present is immobile. In the third and fourth layer lime accumulation is noted due to leaching of calcium carbonate from the surface layer. Phosphate and nitrogen content is low and potash content is average.

The northern part of the Murshidabad district (blocks like Farakka, Suti-I, Suti-II and Samsherganj) consists of basaltic lava flows with intercalated carbonaceous shale and clays. This part of the district has very low soil fertility. This area presents a perfect picturesque of a combination of hill, woods and water. During rainy season the area forms a vast lake in with villages appear as an island. Basloi River and other hill streams from the west Rajmahal hill flood the area every year (Gazetteer by A. Mitra,1979; pp: 10, 15).

In Murshidabad Gazateer 2003, the soil of the district is broadly classified into two:

A) Sub- Vindhyan category of alluvial and

B) The alluvial flood plain of the Ganges.

Further minor classes of the soil are:

a) **Flood plain just near the Ganga-Padma-Bhagirathi River:** This zone found in different police station, likely Beldanga, Bhagawangola, Lalgola, Suti, Farakka,northern part of Raninagar, eastern part of Raghunathganj, middle part of Berhampore.

b) **Gangetic plain land:** This soil zone found in different police station, viz. Domkal, Jalangi, eastern part of Murshidabad and Berhampore, southern part of Raninagar, northern part of Bhagawangola and Hariharpara.

c) **Gangetic upland:** This soil zone found in different police stations, likely Western part of Raghunathganj, Beldanga, Berhampore and Murshidabad, Western and southern part of Suti near Pagla river, western part of Samsarganj, Farakka.

d) **Gangetic lowland:** This soil zone found in different police stations, i.e Nowda, southern part of Hariharpara, eastern part of Beldanga.

e) **Rajmahal flood plain area:** This soil zone found in different police stations, likely Burwan, north-western part of Bharatpur, southern part of Nabagram, Khargram.

f) **Rajmahal plain land:** This soil zone found in different police stations, viz. Kandi, Bharatpur, Nabagram, Khargram.

g) **Rajmahal upper plain land:** This soil zone found in different police stations, likely Sagardighi, Nabagram.

From the different geological, geomorphological and soil classification it is clear that a sharp contrast is noticed between the physical characteristics between 'rarh' and 'bagri' region of the district. The soil property of the 'bagri' region makes the blocks underlying more fertile than the 'rarh' blocks.

RIVER OF STUDY AREA

The Main Rivers

The Ganga or the Padma River

After bounding the extreme north the river Ganges bifurcates into two streams. River Padma flowing south-eastern direction forms the northern and eastern boundaries of Murshidabad. Bhagirathi River, the other branch flow southward bifurcating the district into almost two equal halves as already mentioned in chapter one viz., the 'rarh' and the 'bagri'. The Padma carries an immense volume of discharge and is very wide at places. The main channel is constantly shifting, except high banks. Large islands are continually rising in the channel and some are many miles in length. These islands are inhabited, cleared and cultivated by people and disputes are often raised as to the ownerships of the 'chars' (Sen , J. 1988, pp: 5). The people of these shoals live in temporary huts, for the banks are subjected to annual flooding, Example- 'Nirmal char' of Raghunathganj police station.

The Bhagirathi

The Bhagirathi takes off from the Ganga at Nurpur about twenty five miles away from south Farakka. The river runs parallel to the Padma River for about two miles and turns southward at Biswanathpur in Suti police station. It is very much sinuous near Jangipur and Berhampore. The river finally debouch into the Bay of Bengal after meeting the Jalangi river near Swarupganj in the Nadia district and hence named as river Hoogly. The general flow of the river is from northwest to south east; therefore, the channel Bhagirathi which flows from north to the south carries less volume of water than the Padma River.

Jalangi

The Jalangi River is one of the important rivers in the “bagri” region of Murshidabad. This is a distributary river of Padma River. This river flows from the eastern part of the district and diverts into southwestern direction and enters into the Nadia district. Presently, silting has clogged the mouth of Jalangi from Padma. For few days of the rainy season, when the discharge in the river Padma is abnormally high, some freshets come down the bed of the river but with the fall of the Padma it continues to dry up the course for about three kilometer from it's off- take point remains dry. From this point to its confluence with the river Sialmari, it was fed by local drainage (beel) and underground seepage (Sen, J. 1988, pp: 6). Sialmari has become a mere closed ox bow lake and presently surrounding areas of these streams are converted into agricultural field.

Others Rivers

In ‘rarh’ and ‘bagri’ region of Murshidabad District also found many less important river, likely Bhairab, Sialmari, Basloi, Pagla, Brahmani, Dwarka –Babla.

Cultivated Plants

The district cultivates predominantly rice (‘aus’, ‘aman’ and ‘boro’), wheat, and few maize and barley. Common vegetables grown are potato, brinjal, parwal, bitter gourd, bottle gourd, pumpkin, tomato, ‘puin’, raddish, carrot, beet, cauliflower, cabbage, knol-khol, spinach, onion and other leafy vegetables. The pulses grown are kalai, khesari, masur, arhar, matar, gram, and mung. Oilseeds grown are Groundnut, rye, mustard, til. Spices grown are kalajeera, dhania, haldi. Jute is an important fibre crop of ‘bagri’ region. For the agricultural production analyze some block wise production in following

In 2015-16, Burwan CD Block produced 5,220 tonnes of Aman paddy, the main winter crop from 1,878 hectares, 35,692 tonnes of Boro paddy (spring crop) from 10,346 hectares, 1,360 tonnes of Aus paddy (summer crop) from 507 hectares, 2,314 tonnes of wheat from 890 hectares, 445 tonnes of jute from 33 hectares, 37,401 tonnes of potatoes from 2,999 hectares and 8,196 tonnes of sugar cane from 106 hectares.

In 2015-16, Farakka CD Block produced 1,729 tonnes of Aman paddy, the main winter crop from 851 hectares, 195 tonnes of Boro paddy (spring crop) from 68 hectares, 189 tonnes of Aus paddy (summer crop) from 138 hectares, 1,982 tonnes of wheat from 763 hectares, 31,799 tonnes of jute from 2,041 hectares, 5,140 tonnes of potatoes from 284 hectares and 25,824 tonnes of sugar cane from 400 hectares.

In 2015-16, Sagardighi CD Block produced 118,356 tonnes of Aman paddy, the main winter crop from 35,781 hectares, 36,483 tonnes of Boro paddy (spring crop) from 10,278 hectares, 23,717 tonnes of wheat from 7,927 hectares, 17,102 tonnes of jute from 1,021 hectares and 11,555 tonnes of potatoes from 394 hectares.

In 2015-16, Bharatpur I CD Block produced 96,620 tonnes of Aman paddy, the main winter crop from 30,229 hectares, 23,571 tonnes of Boro paddy (spring crop) from 6,249 hectares, 966 tonnes of wheat from 354 hectares, 4,613 tonnes of potatoes from 346 hectares and 12,060 tonnes of sugar cane from 148 hectares.

In 2015-16, Lalgola CD Block produced 7,057 tonnes of Aman paddy, the main winter crop from 2,594 hectares, 2,630 tonnes of Boro paddy (spring crop) from 751 hectares, 1,216 tonnes of Aus paddy (summer crop) from 649 hectares, 9,870 tonnes of wheat from 3,751 hectares, 227 tonnes of maize from 88 hectares, 134,085 tonnes of jute from 9,881 hectares and 4,176 tonnes of potatoes from 145 hectares.

In 2015-16, Jalangi CD Block produced 11,750 tonnes of Aman paddy, the main winter crop from 3,954 hectares, 14,219 tonnes of Boro paddy (spring crop) from 3,569 hectares, 1,935 tonnes of Aus paddy (summer crop) from 667 hectares, 23,144 tonnes of wheat from 7,834 hectares, 535 tonnes of maize from 207 hectares, 180,928 tonnes of jute from 12,308 hectares, 28,758 tonnes of potatoes from 1,246 hectares and 15,743 tonnes of sugar cane from 59 hectares.

In 2015-16, Berhampore CD Block produced 34,732 tonnes of Aman paddy, the main winter crop from 11,654 hectares, 43,306 tonnes of Boro paddy (spring crop) from 11,293 hectares, 3,161 tonnes of Aus paddy (summer crop) from 1,093 hectares, 22,533 tonnes of wheat from 8,478 hectares, 227,638 tonnes of jute from 13,631 hectares, 4,405 tonnes of potatoes from 154 hectares and 79 tonnes of sugar cane from 1 hectare.

In 2015-16, Murshidabad-Jiaganj CD Block produced 671 tonnes of Aman paddy, the main winter crop from 307 hectares, 5,431 tonnes of Boro paddy (spring crop) from 1,691 hectares, 141 tonnes of Aus paddy (summer crop) from 75 hectares, 8,930 tonnes of wheat from 3,985 hectares, 31 tonnes of maize from 12 hectares, 91,177 tonnes of jute from 7,991 hectares and 9,499 tonnes of potatoes from 495 hectares.

CONCLUSION

From the above discuss it is found that Murshidabad district not much more elevated from mean sea level (on the basis B.M value of the study area). There are also found the suitable agricultural landscape in the favor of topography, soil type and drainage pattern. Eastern side of Murshidabad District is better for the different type of agricultural production than the western side of it. Almost one third population among the total population are agrarian, but their economic conditions not good than the others population. Because every year agriculture production are interrupted by the flood condition or drought prone situation. So urbanization rate in Murshidabad is very low than state and national urbanization rated. According to 2011 census the urbanization rate in Murshidabad, West Bengal and India are 19.78 percent, 31.89 percent and 31.16 percent. As well as HDI and GDI value of Murshidabad is very less than state and national level. If the few agricultural plane or programme are takes, the agricultural production will more and more and this district will be the agricultural 'epitome' in West Bengal and as well as in our country.

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