

ASCERTAINING THE PHYSICAL BASE FOR PLANNING IN BINODPUR VILLAGE, SOUTH 24 PARGANAS, WEST BENGAL

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Abstract: *Regional Planning issues today are complex and frequently overlap with other policy areas such as economic development, transport education provision, healthcare facilities. One of the functions of the planning system is to support the sustainable development of land in the interests of common good. This study aims at ensuring the presence of an efficient physical set up at Binodpur village, South 24 Parganas, within which a comprehensive planning program can be implemented. The village is located on a low-land area which slopes southwards. Most of the land area of Binodpur is devoted to double crop cultivation and the region is dissected by innumerable canals and large ponds. The village is characterized by neutral soil, rich in Potash and receives an excess annual rainfall every year during the wet season. Despite this fact, a considerable proportion of rainwater is wasted as runoff because of the lack of proper knowledge and technique to utilize that water. If proper planning is implemented to channelize the excess water and use it for agricultural practices, the village shows ample prospect of developing its own self-sustained irrigation unit.*

Key words: Regional Development, Local Knowledge, Rainfall Budget, Irrigation Potential.

Introduction

'Physical Base for Planning provides a planned spatial framework of development for the physical environment within which balanced social and economic development can be carried out. Development Plan in a region seeks to achieve greater balance in regional development and enabling all areas to develop their maximum potential. A planning program must set out a physical framework of the area that is to be structured in order to achieve the objectives of planning. The planning process in Binodpur village of Kultali block, South 24 Parganas, should be responsive to the planning issue arising from the existing physical diversity as well as growing cultural diversity. Thus it is necessary to analyse the physical and cultural setting of the area, beforehand, so that planning operations in the concerned region can be smoothly carried on.

Location of the Study Area

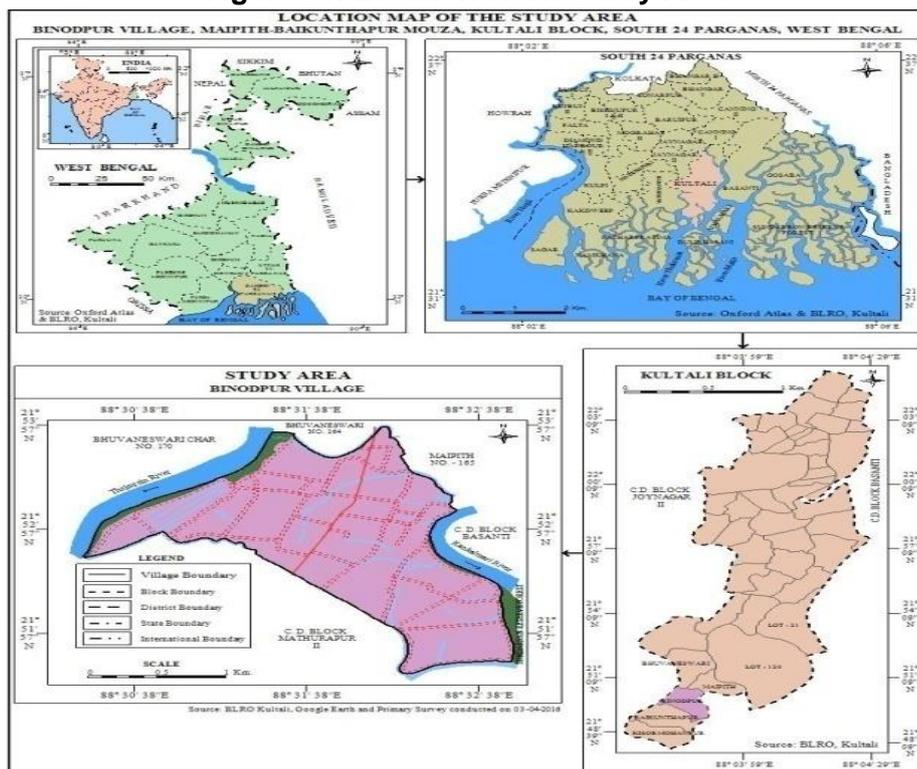
Binodpur mouza lies within the administrative subdivision of Maipith-Baikunthapur gram panchayat of Kultali block, South 24 Parganas. The area is enclosed by 88°30'51.5" E and 88°32'45.9" E longitudes and 21°51'27" N and 21°55'01.2" N latitudes. The sub-district headquarter Jamtalahat is situated 27.5 kilometres away and district headquarter is located 94.3 kilometres away at Alipore. The mouza is surrounded by Bhuvaneshwari Char on the north western part, Maipith on north east CD Block Basanti on the east and CD Block Mathurapur II on the south western portion. Thakurain River flows southwards along the north western boundary of the Mouza while Kankalmari River flows southwards along the north eastern margin of the Mouza. Sunderban Reserve Forest binds the Mouza at its south east.

Selection of the Study Area

Development of a backward region of India by means of implementation of micro-level planning was put as the prime criterion while selecting the study area. According to Indian Rural

Development Report 2013-2014 by IDFC (Infrastructure Development Finance Company) Limited, CESS (Centre for Economic and Social Studies), IRMA (Institute of Rural management Anand) and IGIDR (Indira Gandhi Institute of Development Research); Kultali is the 1300th ranking (in descending order) backward block of India (among 5955 studied blocks of the country). This ranking is based on the availability of rural infrastructural facilities like road networks, electricity, sanitation, health, housing, drinking water and education. Maipith-Baikunthapur Gram Panchayat, the southern last habitable island of West Bengal is one of the most backward gram panchayats of this block. Within the gram panchayat, Binodpur village where 20.28% of the population thrives below poverty level has been chosen for this study. Land resource potential of the village has been evaluated.

Figure 01: Location of the Study Area



Objectives

The paper aims at exploring the natural resource base of Binodpur village of Kultali block of South 24 Parganas.

Literature Review

According to R.C. Chandna (2000) "The basic objective of any development planning is to improve the standard of the people in general and to improve the quality of life in the region. Improvement in the standard of living could be achieved by following the principles of land use planning namely, optimum use of land, multiple use of land and no waste of land. By following these principles the land resource base is put to its optimal use without any wasteful use of land." Jayashree Roy Chowdhury (2001) holds the view - "..... economic plan can hardly be expected to succeed without a proper infrastructure. Mahesh Chand and V. K. Puri (1983) stated that- "..... for the purposes of planning it is necessary to study the natural resources of regions in detail, and also to find out areas of potential development and to trace inter-linkages among them (and within them) in such a fashion as to promote maximum development of resources."

Methodology

To develop an idea about the physical setup of the study area, a field survey had been

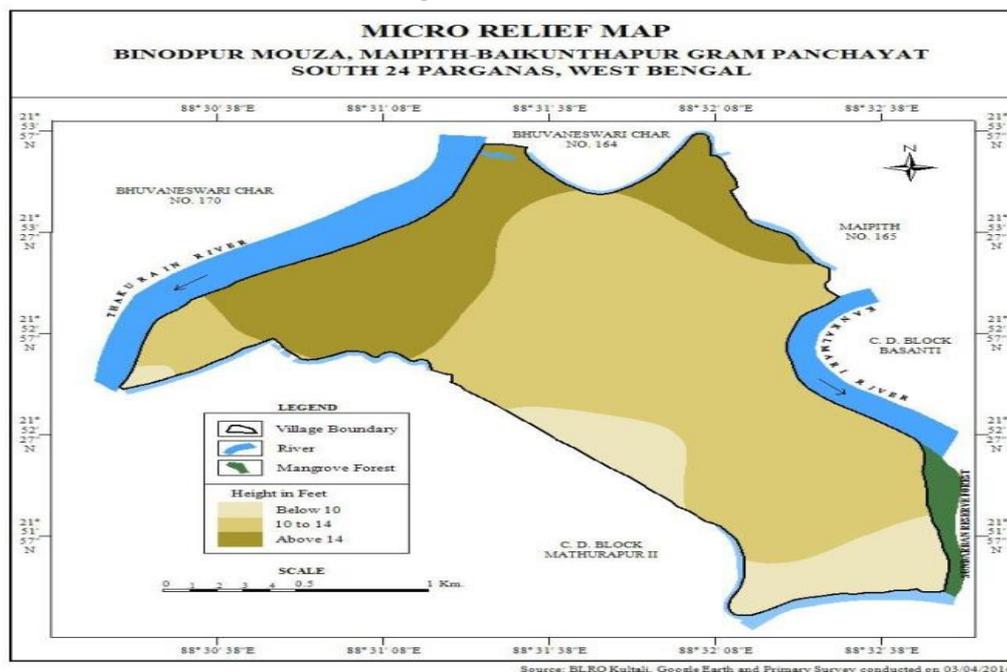
conducted to Binodpur Mouza of Maipith-Baikunthapur gram panchayat, Kultali block, South 24 Parganas. In course of primary survey, local knowledge was utilized and an instrument survey (using GPS Garmin 72H) was conducted. Prior to this secondary information and maps were collected from the block office situated at Jamtalahat, Kultali. Climatic data was collected from Agro-meteorology Division, Department of Agriculture, and Government of West Bengal. Information regarding soil characteristics was derived from Vivekananda Institute of Biotechnology, Soil, Water and Organic Fertilizer Testing Lab, Sri Ramkrishna Asram, Nimpith, South24 Parganas. Later it was tallied with information provided by the local farmers during primary survey. The final report was prepared by classification and analysis of data using GIS Software and different cartographic techniques. The entire study has been carried out on the basis of local people's knowledge and personal expertise. The complete procedure in which the research work has been carried out is determining the planning problem, setting out the planning objectives, analysing the physical and cultural setup of the region, identifying the land resource potentials of the region and preparation of the developmental plan.

Micro Relief

Micro Relief refers to the slight irregularities of land surface causing variations in elevation amounting to less than 50 feet. The entire study area has been divided into 3 consecutive zones on the basis of variation in elevation. It is briefly demonstrated below:

- **Land surface with elevation below 10 feet-** Only 12.84% of the land area of the village have elevation below 10 feet. It is found along the southern fringes of the village.
- **Land surface with elevation ranging between 10 feet to 14 feet-** The average elevation of the entire village varies between 10 to 14 feet. 62.0008% of the total land area of the village comes under this subdivision.
- **Land surface with elevation above 14 feet-** Parts of north -west and north exhibits land surface with elevation more than 14 feet. It covers 25.539% of the total land area of the village. The general direction of slope of land is from north to south and the village has an average elevation of 10-14 feet covering 3967897.250 square meters (3.97 square kilometres) area.

Figure 02: Relief Map



Land Cover and Land Use

The general land cover and land use of the area has been analysed with the help of the data obtained through primary survey and Google earth. A detailed demonstration of it has been given below.

A. Land Cover

- i. **River:** The village is marked by rivers Thakurain and Kankalmari along its north western and eastern margins respectively. Only a small part of the river Thakurain enters the village from its north-west boundary.
- ii. **Mangrove Forest:** The village is flanked by mangrove vegetation along its entire west and covers an area of 147102.41 square meters.

B. Land Use

- i. **Big Pond:** There are numerous large ponds located inside the village and they cover an area of 16250.5 square meters. These were excavated during the time when zamindari system prevailed in the area. Presently they lack ownership and are used for local fishing.
- ii. **Single Cropped Agricultural Land:** These types of agricultural lands are very few in number and constitutes of 222599 square meters. These lands are devoted to the cultivation of only one type of crop such as Aman Rice. Sometimes Boro Rice is also grown in these types of lands.
- iii. **Double Cropped Agricultural Land:** This type of agricultural land constitutes a major portion of the land area of the village i.e., 2850009.87 square meters. The double cropping cultivation in Binodpur has a distinctive unique feature. The actual farmland is used to grown single crops like Paddy (mainly Aman), 'Khasari Karai', Sunflower, Potato etc. But the 'bandh' (or raised lands between two adjacent farmlands) are cultivated twice a year with crops like 'Mug Karai', Okra (Bhindi), Bitter Gourd (Karela), Eggplant etc.
- iv. **Plantation Agriculture:** A significant stretch of plantation farmlands are visible in the western part of the village, nearer to mangrove forest and they cover an area of 162250.150square meters. These farmlands are mostly used for strip plantations of either side irrigation canals. Casuarina (Jhow) is usually planted alongside the canals. Within the cultivable lands this type of farming is undertaken in the localities the traditional forested areas and executed on a participatory mode involving the local communities. This is mainly an outcome of social forestry program by Department of Sunderban Affairs, Government of West Bengal.
- v. **Settlement:** Settlement areas cover 301604.120square meters of the total village area. Small patches of nucleated settlements are found near state highway, agricultural canals and large ponds. Linear settlements are viewed in a few places along the unmetalled roads.
- vi. **Canal:** The village is intersected by innumerable canals and the total land area covered by those is 122440.690 square meters.
- vii. **Roadways:** A state highway passes through the centre of the village. Apart from that the village is connected all through via unmetalled roads.

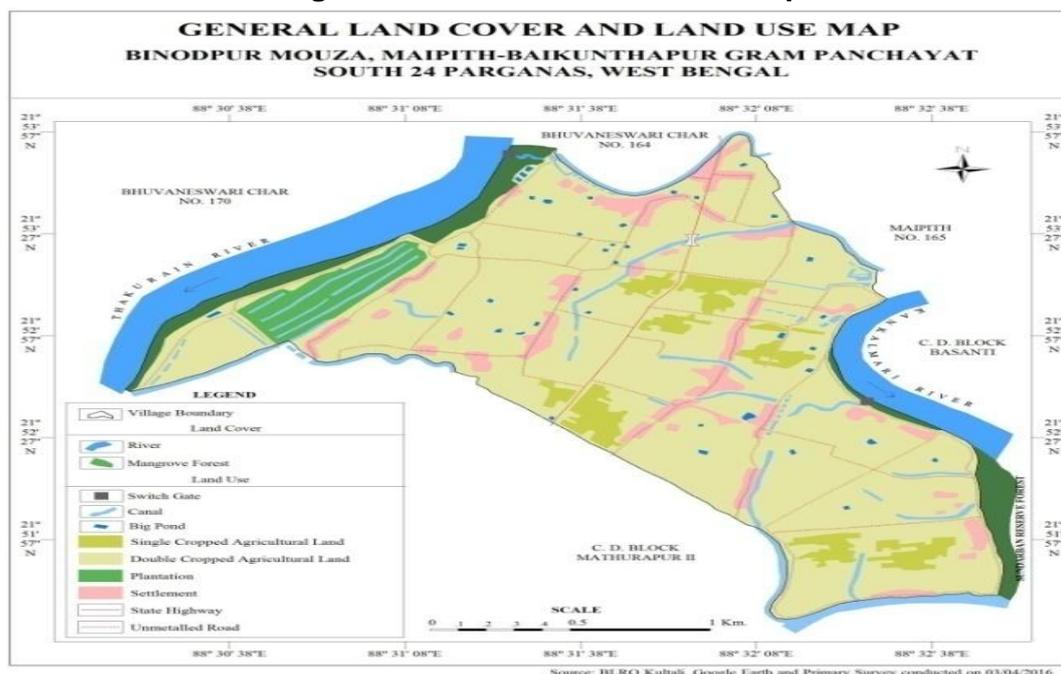
Climatic Profile

The climatic profile of Binodpur village has been analysed on the basis secondary data collected from Agro-meteorology Division, Department of Agriculture, and Government of West Bengal. The different aspects of climatic conditions prevailing in the village are discussed below-

- a. **Monthly Mean Temperature:** The monthly mean temperature of the village remains moderately high throughout the year. The highest temperature of 29.3°C is recorded in the month of May. January exhibits the lowest temperature of 19.1°C.
- b. **Monthly Rainfall:** The village receives a total rainfall of 191.94 cm throughout the year. The village receives the highest amount of rainfall in the month of August (419.3mm) while the lowest amount of rainfall is received in the month of January (9.9mm).
- c. **Potential Evapotranspiration:** The total amount of potential evapotranspiration taking place in the area is 1631.5mm. Maximum evapotranspiration takes place in the month of May (262.8mm) whereas the minimum amount of evapotranspiration takes place in the

month of December (88.3mm). It has been observed that an excess amount of moisture in the atmosphere is available from June to October. The remaining part of the year exhibits a deficit of moisture.

Figure 03: Land Use Land Cover Map



Soil Characteristics

The soil characteristics of Binodpur village have been analysed on the basis of the data obtained from Vivekananda Institute of Biotechnology, Soil, Water and Organic Fertilizer Testing Lab, Sri Ramkrishna Asram, Nimpith, South24 Parganas. The agricultural plots of selected farmers of Binodpur Mouza are considered as sampling units for the soil survey by the Institute. It has been found that the village soil is deficient in Organic Carbon, soil P^H is neutral, some part of the village land is deficient in Nitrogen while some have considerable Nitrogen content, phosphate content is low, potash level is moderate to high. Due to excess downpour taking place in the region the bases contained in the upper strata of soil are leached out, making it neutral in state and deficient in nitrogen, phosphorous and organic carbon. Potash level is moderate to high due to application of fertilizers.

Rainfall Budget

The major proportion of the land area of the village is covered by agricultural land (2900 square meter). The agricultural lands are found to receive an excess of 0.814850311 cubic meter moisture during the wet period (June to October). Due to lack of proper knowhow to trap and utilize this water for agricultural practices, 0.594840727 cubic meter of water flows as run off.

Canal Irrigation Potential

The village has considerable potentials for developing its own irrigation system. The entire area is intersected by numerous small canals. The density of the canals is found to be greater near the village boundary than its interior due to their proximity to the source of their water supply. The sources of water to these canals are the main large canals which are located outside the administrative boundary of the village. These small canals were once the branches of the Bhuvaneshwari Khal. But at present some part of it is segmented to meet the needs of the emerging trend of the fragmented landholdings whereas some parts of it are covered and converted to uplands (or, 'Aal') on which cultivation is practiced. But if the canals are extended or connected with each other, it will increase the irrigation potential of the village.

Proposed and Implemented Governmental Schemes

Binodpur village shows a notable prospect for development of its land resources irrigation and agricultural system. With this growing concern, a few BRGF schemes are introduced in the village. But unfortunately the BRGF scheme has been terminated in the recent years.

In the annual action plan (2016-2017) of MGNREGS the following schemes are proposed and implemented. This has in turn increased work participation in the excavation and construction works. The MGNREGS implemented actions provided work opportunity to the villagers and people of the adjoining areas.

Proposed Plan for joining and Extension of Canals

After a comprehensive study of the physiography, climate, soil, land use features and irrigation potentiality of the village, a suggestive plan has been proposed for joining and extension of the canals of the village in order to trap the excess moisture received by the area. Two considerably long canals are spotted in the village- one at the north-eastern part and the other in the south-eastern portion. If provisions are made to join these two canals and channelize the excess through these, agricultural fields in the entire eastern part will be benefitted. Besides the amount of rainwater, which would, otherwise have been lost as runoff can be checked. The supply of water in the fragmented small canals of the nearby agricultural lands can also be enhanced if they are inter-connected. This, in turn, will increase the agricultural productivity of the village. The hindrances from road connections can be overcome by constructing culverts. The influx of saline water from the nearby river can be prevented by the maintenance of the pre-existing sluice gates.

Increase in workforce by implementation of Governmental Schemes

The Government as well as local administrative body must be more active in proper implementation of developmental schemes so as to extend the irrigation techniques in the village in order to enhance its agricultural productivity. Besides MNREGS should introduce more action plans as it will as a result create local participation through increase in workforce, leading to increase in employment opportunities. As per the standards provided by MGNREGS, 62 cubic feet earth is extracted per day per labour. If the proposed plan for joining and extension of canal is brought into action, 5873037500 cubic feet earth will be extracted for canal construction purposes. This will provide employment of labour for approximately 94726412 days. Besides if the proposed MGNREGS schemes as per their 2016-2017 action-plan is implemented it will create a high labour demand, such as the pond excavation works needs 385 labour forces each, repair of earthen drains connecting culverts and river embankments require 631 labour power each and the road extensions for accessing irrigation units involves 308 workforces each. The involvement of local works and workers from surrounding areas in the constructional works will enhance local participation increased job opportunities.

Recommended Plan for Agricultural Practices

The village exhibits spatial variation of land surfaces on the basis of its elevation. This feature can be taken into consideration while planning agricultural land use because it can yield the maximum productivity. In addition to Aman cultivation, the following cropping pattern must be recommended: Upland areas ranging above 14 feet in elevation can be used to grow vegetables; Whereas the relatively low lands should be devoted to grow pulses; The low lands (below 10 feet) should use for growing fodder crops (Dhonche) as this will in one hand help in nitrogen fixation and besides will also protect the watershed areas of the river embankments; Proper management of agricultural land can affect availability and supply of water. It will preserve soil moisture for more crop production. Apart from this it will also regulate groundwater levels and discharge of water from upland to low land.

Figure 04: Canal Density Map

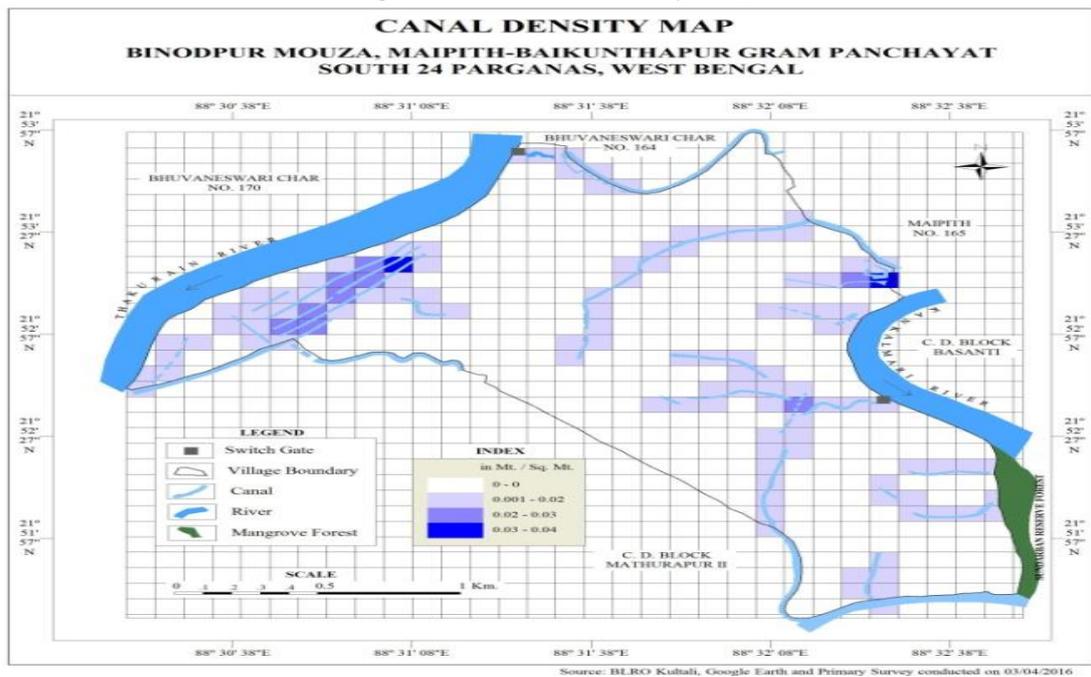
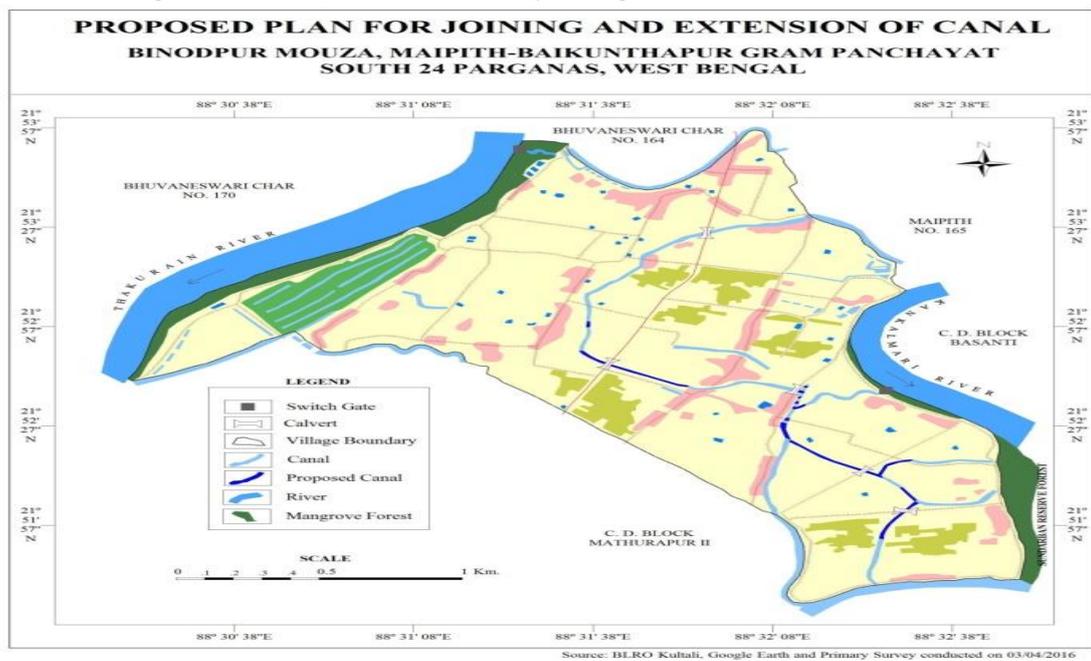


Figure 05: Proposed Plan for joining and Extension of Canals



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