



Research Article

## A Geographical Study of Soil, Agricultural Resources and Livelihood, Dakshin Dinajpur District, West Bengal

Dr. Dipankar Mondal \*

State Aided College Teacher, Department of Geography,  
Balurghat Mahila Mahavidyalaya, University of Gour Banga, West Bengal, India

Corresponding Author: \* Dr. Dipankar Mondal

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### Abstract

Dakshin Dinajpur district is one of the important agricultural regions of West Bengal. The economy, society, and livelihood of the district are largely dependent on soil resources and agriculture. This research paper discusses the nature of soil, agricultural resources, cropping patterns, and livelihood structure of the Dakshin Dinajpur district. Different types of soils, such as alluvial soil, loamy soil, and sandy loam soil, play a significant role in agricultural production. Rice, jute, wheat, potato, mustard, pulses, and vegetables are the major crops cultivated in the district. Besides agriculture, livestock rearing, fishery, and small-scale trade also contribute to the livelihood of the people. The study highlights several challenges, including soil fertility loss, flood problems, inadequate irrigation facilities, climate change, and a lack of modern agricultural technology. Sustainable agricultural development, soil conservation, and proper resource management are essential for the socio-economic development of the district.

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**KEYWORDS:** Soil, Agricultural Resources, Livelihood, Agriculture, Alluvial Soil, Irrigation.

## 1. INTRODUCTION

Agriculture is one of the most important sectors of the Indian economy, and soil acts as the fundamental base of agricultural production. Dakshin Dinajpur district of West Bengal is predominantly an agricultural district where most of the population directly or indirectly depends on agriculture for their livelihood. The geographical environment, river system, climate, and soil characteristics of the district strongly influence agricultural activities.

Dakshin Dinajpur district was formed in 1992 after the division of the erstwhile West Dinajpur district. Balurghat is the district headquarters. The district is bounded by Uttar Dinajpur in the north, Bangladesh in the south, and Malda in the east.

The major rivers of the district are the Atrayee, Punarbhaba, Tangon, and Ichhamati rivers. These rivers contribute significantly to soil formation and agricultural productivity. The total area of the Dakshin Dinajpur district is about 2,219 square kilometres. The latitude and longitude of the district are:

**Latitude:** 25°10'55" N to 26°35'15" N

**Longitude:** 87°48'37" E to 89°00'30" E

The average elevation of the district is approximately 25–26 meters above sea level. Due to its border location, the district plays an important role in trade and cultural exchange between neighbouring regions and countries. The present study focuses on the nature of soil, agricultural resources, and livelihood patterns of the Dakshin Dinajpur district, along with the major challenges and developmental possibilities.

## 2. OBJECTIVES OF THE STUDY

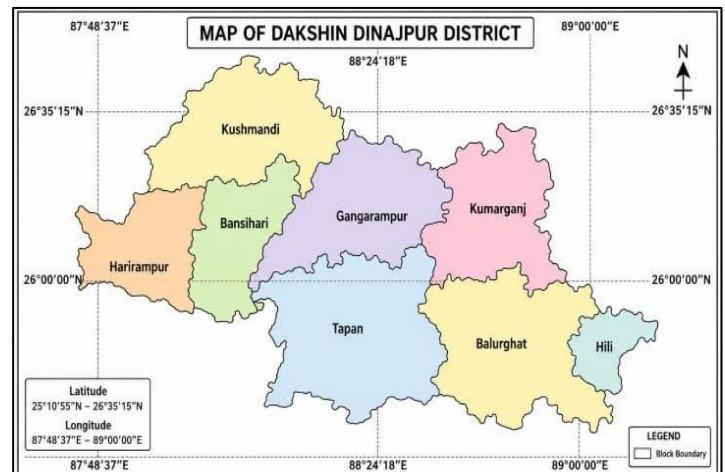
1. To analyse the nature and characteristics of soil in the Dakshin Dinajpur district.
2. To discuss the major agricultural resources and cropping patterns of the district.
3. To examine the relationship between agriculture and livelihood.
4. To identify the major problems related to soil and agriculture.
5. To suggest measures for sustainable agricultural development.

## 3. METHODOLOGY

The study is mainly based on secondary data. Information has been collected from books, journals, government reports, census reports, agricultural department publications, and online sources. Descriptive and analytical methods have been applied to interpret the data.

### Geographical Background of Dakshin Dinajpur District

Dakshin Dinajpur is situated in the northern part of West Bengal. The total geographical area of the district is approximately 2,219 square kilometres. The climate of the district is a tropical monsoon type with hot summers, humid rainy seasons, and cool winters. The average annual rainfall ranges between 1500 mm and 1600 mm.



### River System and Water Resources

The major rivers of this district are the Atrai, Punarbhaba, Tangan, Ichhamati, and Shrimati rivers. These rivers flow mainly from north to south and serve as the main foundation of the district's agriculture and water resources. The Atrai River is the most important river of the district and flows beside Balurghat town. The Punarbhaba River flows through the Gangarampur and Tapan blocks. The Tangan River plays an important role in the agricultural activities of the Kumarganj and Gangarampur blocks. These rivers remain full of water mainly during the monsoon season and contribute significantly to agriculture. Besides these, several canals and streams are also found in the district, among which Dakra Khari, Kashiya Khari, and Kalkala Khari are notable.

Rivers	Importance
Atrayee	Irrigation and Agriculture
Punarbhaba	Soil Fertility
Tangan	Water Resource
Ichhamati	Local Agricultural Support

### Climate

The climate of the Dakshin Dinajpur district is generally characterised as a Humid Tropical Monsoon Climate. The district experiences three major seasons: summer, monsoon, and winter. The climate is strongly influenced by the southwest monsoon and remains suitable for agriculture throughout the year due to high humidity and fertile environmental conditions.

### Summer Season (March–June)

The summer season in Dakshin Dinajpur generally extends from March to June. During this period, the weather remains hot and dry. April and May are usually the hottest months of the year. The daytime temperature often rises between 35°C and 40°C, and occasionally heatwave conditions are experienced. The sky remains mostly clear, and strong sunlight increases the intensity of heat. Water levels in rivers and ponds decrease during this season. People in rural areas usually prefer to work in the early morning or evening because the afternoon becomes extremely hot. Summer is also the season of fruits such as mango, jackfruit, litchi, and watermelon. Mango and litchi cultivation are especially significant in different parts of the

district. At the end of summer, Nor'wester storms (Kalbaisakhi) frequently occur, bringing sudden rain and temporary relief from the heat. These storms also indicate the arrival of the monsoon season. The summer season has an important impact on agriculture, daily life, and the environment. Irrigation requirements increase in agricultural fields, and the demand for drinking water also rises.

### Monsoon Season (June–September)

The monsoon season usually lasts from June to September. Heavy rainfall occurs due to the influence of the Southwest Monsoon winds. During this season, the weather becomes humid and comparatively cooler. Heavy rainfall is observed in the basins of rivers such as the Atreyee, Punarbhaba, and Tangon. Excessive rainfall often raises river water levels, causing waterlogging and floods in low-lying areas. This season is extremely important for agriculture, especially for the cultivation of Aman paddy, which depends heavily on monsoon rainfall. During the monsoon, the landscape becomes greener with lush crop fields, trees, and wetlands. However, excessive rainfall often makes rural roads muddy and creates transportation problems. Farmers remain busy with cultivation activities due to the abundance of water. Fishing and jute cultivation also increased during this period. At times, floods and excessive rainfall damage crops and disrupt normal life. Therefore, while the monsoon season makes nature green and vibrant, it also creates challenges for the people of the district.

### Winter Season (November–February)

The winter season in Dakshin Dinajpur generally begins in late November and continues until February. The weather remains cool, dry, and pleasant during this time. December and January are the coldest months of the year. The average temperature usually ranges from 10°C to 20°C, while in some places it may fall between 7°C and 15°C. Dense fog is common during early mornings and nights, especially in rural areas, though urban areas experience comparatively less fog. Cold winds blowing from the north intensify the feeling of winter. During the daytime, mild sunshine and dry weather prevail. Winter is highly important for agriculture. After harvesting paddy, farmers cultivate various Rabi crops such as wheat, mustard, potato, pulses, and vegetables. The cool weather supports healthy crop growth and increases agricultural productivity. People wear warm clothes during this season, and scenes of villagers warming themselves beside fires are common.

Traditional winter foods such as Pithe-Puli, date palm juice, and Nolen Gur are special attractions of the season. Various fairs, cultural programs, and festivals are organised during winter, making the season socially and culturally significant. Winter is also considered the best time for tourism in the district. Tourist attractions such as Gour Dighi, Mahipal Dighi, and Bangarh become more attractive during this period. Thus, winter represents an important chapter of natural beauty, agricultural prosperity, and folk culture in the Dakshin Dinajpur district.

### Rainfall and Temperature Characteristics

Most of the rainfall in Dakshin Dinajpur occurs due to the Southwest Monsoon. The district receives an annual rainfall of approximately 1000–1800 mm.

About 65%–80% of the total rainfall occurs during the monsoon season (June–September).

Nearly 90% of the rainfall takes place between April and September.

### Temperature Conditions

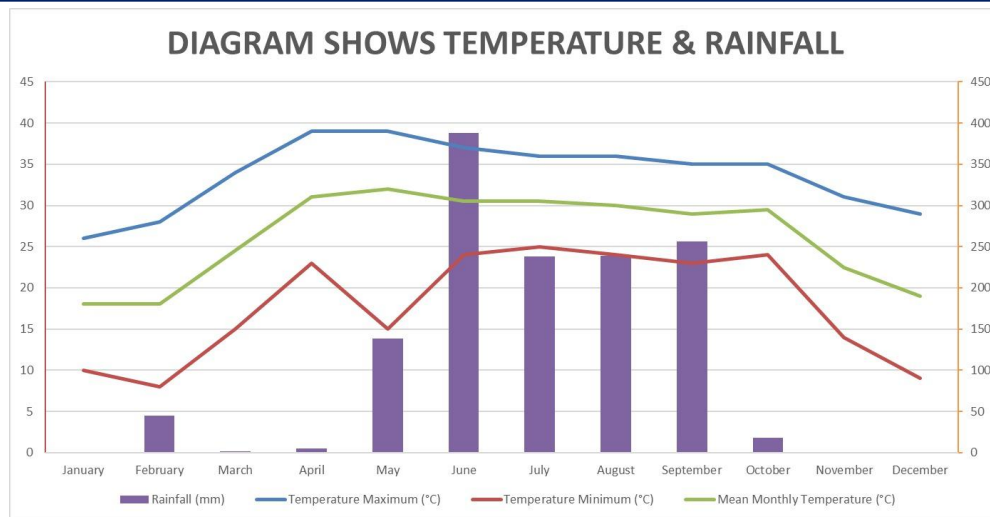
**Summer:** Temperature may rise up to 35°C–40°C.

**Winter:** Temperature may fall to around 7°C–15°C.

**Average annual temperature:** Approximately 25°C–26°C.

At present, urbanisation and global warming are gradually increasing the temperature of the region. Due to its relative proximity to the Himalayas, the climate remains comparatively moderate and comfortable. High humidity throughout the year creates favourable conditions for agriculture.

Month	Temperature in °C		Rainfall	
	Maximum	Minimum	Mean Monthly	In mm
January	26	10	18	-
February	28	8	18	45
March	34	15	24.5	1
April	39	23	31	5
May	39	15	32	138
June	37	24	30.5	388
July	36	25	30.5	238
August	36	24	30	239
September	35	23	29	256
October	35	24	29.5	18
November	31	14	22.5	-
December	29	9	19	-



### Nature and Characteristics of Soil

The soil of Dakshin Dinajpur is mainly composed of alluvial soil of the Ganga–Brahmaputra basin, which is highly fertile and suitable for agriculture. This soil is ideal for the cultivation of rice, jute, wheat, and potatoes. The soils of the district can generally be divided into the following categories:

#### Recent Alluvial Soil

Recent alluvial soil is formed by newly deposited sediments brought by rivers such as the Atrayee and Punarbhaba. It is extremely fertile and highly suitable for agriculture. Crops like rice, jute, wheat, and pulses grow well in this soil. This soil is mainly formed from river-borne alluvium. Rivers flowing through the district, especially during the monsoon season, deposit large amounts of silt in nearby floodplain areas. The soil consists of a mixture of sand, silt, and clay. The particles are soft and fine in texture. The soil is highly fertile and rich in nutrients such as nitrogen, potassium, and phosphorus. It is generally light grey to yellowish in colour. The soil is soft, easy to cultivate, and suitable for medium to high irrigation. Recent alluvial soil is mainly found in: Riverbank regions, Lowland areas, and Flood-affected zones. It is especially abundant along the banks of the Atrayee and Punarbhaba rivers. Agricultural Importance-This soil greatly supports the agricultural economy of the district. The major crops grown include: Rice (especially Aman and Boro varieties), Jute, Wheat, Vegetables and fruits. Problems: Soil erosion during floods, Excessive deposition of silt changes the land level, and waterlogging in some areas. Recent alluvial soil plays an important role in improving agriculture, economy, and settlement in Dakshin Dinajpur. Proper flood and drainage management can help utilise this soil more effectively.

#### Old Alluvial Soil

Old alluvial soil is comparatively older, more compact, and less fertile than recent alluvial soil. However, with proper irrigation and fertiliser application, good agricultural production is possible. This soil was formed thousands of years ago by river-borne deposits on ancient floodplains. Due to changes in river courses, these areas no longer receive fresh alluvium, and

hence, the soil is called “old” alluvial soil. The soil contains sand, silt, and clay, but is relatively denser and harder. In many places, the clay content is high. The colour of the soil is reddish, brownish, or yellowish due to the presence of iron oxide. Compared to recent alluvial soil, its fertility is lower because of prolonged cultivation and nutrient depletion. The water retention capacity is moderate, though drainage problems may occur in some places. Old alluvial soil is mainly found in: Elevated and ancient land surfaces, Areas away from rivers, and old floodplains. Agricultural Importance-With proper management, the following crops can be cultivated: Rice, Wheat, Pulses, Oilseeds, and Vegetables. The application of organic and chemical fertilisers can significantly increase productivity. Problems: Lower fertility requires more fertilisers, Hard soil makes cultivation difficult, and poor drainage in some areas. Old alluvial soil remains an important agricultural resource of Dakshin Dinajpur despite its comparatively lower fertility.

#### Loamy Soil

Loamy soil is one of the most important and fertile soils of Dakshin Dinajpur. It is formed by a balanced mixture of sand, silt, and clay. Characteristics -Soft and crumbly texture, Easy to cultivate, good water retention without excessive waterlogging, Proper air circulation, Light brown or grey colour. This soil is commonly found in: River-adjacent areas, Medium-elevated lands, Rural agricultural fields. Agricultural Importance: Loamy soil is considered the most productive and versatile soil. Major crops include: Rice, Wheat, Jute, Potato, Vegetables such as brinjal, tomato, and cabbage, Fruits like mango and banana, etc. It is highly suitable for intensive farming and supports the livelihood of farmers.

#### Sandy Loam Soil

Sandy loam soil contains a higher proportion of sand, while silt and clay are comparatively lower. Characteristics-Light and granular texture, Rapid drainage of water, Low water retention capacity, heats up quickly, Light yellow or pale brown in colour, this soil is mainly found in: Riverbank regions, Elevated

and relatively dry lands, Agricultural Importance-Crops that require less water grow well in this soil, such as: Groundnut, Potato, Pulses, Watermelon, Muskmelon, Certain vegetables, Proper irrigation and fertilizer use can improve productivity. The soils of Dakshin Dinajpur are predominantly fertile alluvial soils that support agriculture and the rural economy of the district. Different soil types, such as recent alluvial, old alluvial, loamy, and sandy loam soils, each have distinct characteristics and agricultural significance.

#### **Agricultural Resources of Dakshin Dinajpur District**

Agriculture is the backbone of the district's economy. Most people are engaged in agricultural activities.

#### **Paddy Cultivation**

Paddy is the principal crop of the district. Aus, Aman, and Boro varieties of rice are cultivated.

Importance of Paddy: Main food crop, provides employment, Major contributor to the economy.

#### **Jute Cultivation**

Jute is an important cash crop cultivated in several parts of the district. Uses of Jute: Rope making, Sack production, Industrial raw material.

#### **Wheat Cultivation**

Wheat is cultivated mainly during the winter season.

#### **Potato Cultivation**

Potatoes are an important cash crop and provide additional income to farmers.

#### **Mustard and Pulse Cultivation**

Mustard and pulses are important Rabi crops that improve soil fertility and nutritional security.

Crop	Season	Importance
Paddy	Kharif and Rabi	Main food crop
Jute	Kharif	Cash food
Wheat	Rabi	Food grain
Potato	Rabi	Cash crop
Mustard	Rabi	Oilseed crop
Pulses	Rabi	Nutritious crop
Vegetables	Throughout the year	Economic importance

#### **Vegetable Cultivation**

Various vegetables such as tomato, brinjal, cabbage, cauliflower, pumpkin, and bottle gourd are cultivated.

#### **Irrigation System and Agricultural Development**

Irrigation plays a crucial role in agricultural productivity.

#### **Canal Irrigation**

Water from rivers and canals is used for irrigation.

#### **Tube Well Irrigation**

Both shallow and deep tube wells are used for groundwater irrigation.

#### **Ponds and Water Bodies**

Many farmers depend on ponds and local water bodies for irrigation.

#### **Problems of Irrigation**

1. Lack of electricity
2. Decline in groundwater level
3. Inadequate irrigation infrastructure
4. High irrigation costs

#### **Livelihood Pattern**

The livelihood of the people of Dakshin Dinajpur is mainly agriculture-based.

#### **Agriculture**

Most people work as farmers or agricultural labourers.

#### **Livestock Rearing**

Cattle, goats, poultry, and duck farming provide supplementary income.

#### **Importance of Livestock**

1. Milk production
2. Meat production
3. Organic manure supply
4. Additional earnings

#### **Fishery**

Fish farming in ponds and water bodies is an important source of livelihood.

#### **Small-scale Trade**

Trading of agricultural products, fertilisers, and seeds supports rural livelihoods.

#### **Cottage Industries**

Handicrafts, weaving, bamboo work, and pottery are practised in some rural areas.

#### **Major Problems Affecting Agriculture and Livelihood**

##### **Climate Change**

Irregular rainfall, droughts, and excessive rainfall adversely affect agriculture.

##### **Floods**

Floods during the monsoon season damage crops and agricultural land.

**Agricultural Credit Problems**

Small and marginal farmers often do not receive sufficient financial support.

**Market Problems**

Farmers frequently fail to get fair prices for their agricultural products.

**Technological Limitations**

Many farmers still lack access to modern agricultural technology.

**Prospects of Sustainable Agricultural Development**

Sustainable agricultural practices are essential for the future development of the district.

**Organic Farming**

Use of organic fertilisers and bio-pesticides can improve soil health.

**Modern Technology**

Improved seeds, mechanisation, and modern irrigation methods can increase productivity.

**Soil Conservation**

Afforestation, embankment construction, and proper land management can reduce soil erosion.

**Agricultural Training**

Farmers should be trained regarding modern farming methods.

**Market Development**

Proper market infrastructure and storage facilities are necessary.

**Relationship between Environment and Agriculture**

The environment and agriculture of Dakshin Dinajpur are closely interconnected. Soil, climate, rivers, and vegetation influence agricultural productivity. On the other hand, excessive use of chemical fertilisers and pesticides negatively affects the environment. Eco-friendly agricultural practices such as organic farming, water conservation, and afforestation are essential for environmental sustainability.

**Socio-economic Importance**

Agriculture plays a significant role in the socio-economic development of the Dakshin Dinajpur district.

**Social Importance**

1. Forms the basis of rural society
2. Strengthens social unity
3. Associated with rural culture and festivals

**Economic Importance**

1. Generates employment
2. Increases district income
3. Supports rural markets
4. Promotes small-scale industries

**Suggestions and Recommendations**

**The following measures may improve agriculture and livelihood in the Dakshin Dinajpur district:**

1. Expansion of soil testing facilities.
2. Promotion of organic farming.
3. Improvement of irrigation systems.
4. Easy agricultural loans for farmers.
5. Agricultural training and awareness programs.
6. Development of storage facilities.
7. Effective flood and riverbank erosion control measures.
8. Ensuring fair prices for agricultural products.
9. Conservation of groundwater resources.
10. Development of agro-based small-scale industries.

**CONCLUSION**

Soil, agricultural resources, and livelihood are deeply interconnected in the Dakshin Dinajpur district. Fertile alluvial soil and favourable climatic conditions support agricultural activities. Agriculture remains the primary source of livelihood for the majority of the population. However, climate change, declining soil fertility, inadequate irrigation, and market-related problems pose major challenges to agricultural development. Sustainable agricultural practices, proper soil conservation, modern technology, and government support can significantly improve the agricultural economy and livelihood conditions of the district. Thus, planned development and effective resource management are essential for the sustainable future of the Dakshin Dinajpur district.

**REFERENCES**

1. Government of West Bengal. District Gazetteer: Dakshin Dinajpur. Kolkata: Government of West Bengal; n.d.
2. Office of the Registrar General and Census Commissioner, India. Census of India Reports. New Delhi: Government of India; various years.
3. Government of West Bengal. Agricultural Reports of West Bengal. Kolkata: Department of Agriculture, Government of West Bengal; various years.
4. Soil Survey and Land Use Organisation. Soil Survey and Land Use Reports. Kolkata: Government of West Bengal; various years.
5. Various authors. Articles published in Geography and Agriculture Journals. Various places of publication; various years.
6. Department of Agriculture and Irrigation, Government of West Bengal. Publications of the Department of Agriculture and Irrigation. Kolkata: Government of West Bengal; various years.
7. Government of West Bengal. Rural Development Reports of Dakshin Dinajpur. Kolkata: Department of Rural Development; various years.
8. Various authors. Books and Journals on Environmental Geography. Various places of publication; various years.
9. Bose SC. Geography of West Bengal. Kolkata: Firma KLM Pvt. Ltd.; 1978.
10. Bhattacharya K. Bangladesh Rivers and River Management. Kolkata: Minerva Associates Publications Pvt. Ltd.; 1998.

11. Ghosh S. History of North Bengal. Kolkata: Progressive Publishers; n.d.
12. Sengupta JC. West Bengal District Gazetteers. Kolkata: Government of West Bengal; n.d.
13. Strong FW. Gazetteer of Dinajpur. Calcutta: Bengal Secretariat Book Depot; 1912.

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**About the Author**

**Dr Dipankar Mondal** is a State Aided College Teacher in the Department of Geography at Balurghat Mahila Mahavidyalaya, affiliated with the University of Gour Banga, West Bengal, India. His academic interests include agricultural geography, soil resources, rural livelihoods, environmental studies, and regional development, with a focus on sustainable resource management.