Agricultural Productivity
and
Regional Imbalances

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Introduction

a) Presentation of the Problem

The district of Malda, located in the middle part of the West Bengal and drained by the Mahananda, the Kalindri and the Ganga is ideal for agricultural operation. The ecological setting viz. landscape, soil and climate, have made it more farming oriented. This apart, sericulture and the cultivation of mango have made the district famous. The physical variation along with the edaphic variation has controlled regional agricultural scene. With the motive of studying these variations in mind and as a researcher from this district, the agricultural pattern in Malda has been chosen for an in-depth study.

Malda district is one of the most under-developed districts of West-Bengal. Agriculture is the mainstay of the district's population. Majority of this population is dependent upon agriculture. One of the major objectives of the development of agriculture in Malda district is to improve the living standard of the people in the rural areas through effective agricultural operations.

This district is divided into two subdivisions, 15 administrative blocks, 11 police stations, 15 Panchayat samities and 147-gram panchayats. Physiographically, Malda district is divided into three regions 'Tal', 'Barind' and 'Diara'. The following table 1.1 shows the region wise distribution of blocks of the district.

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Table 1.1: Natural Regions of Malda District

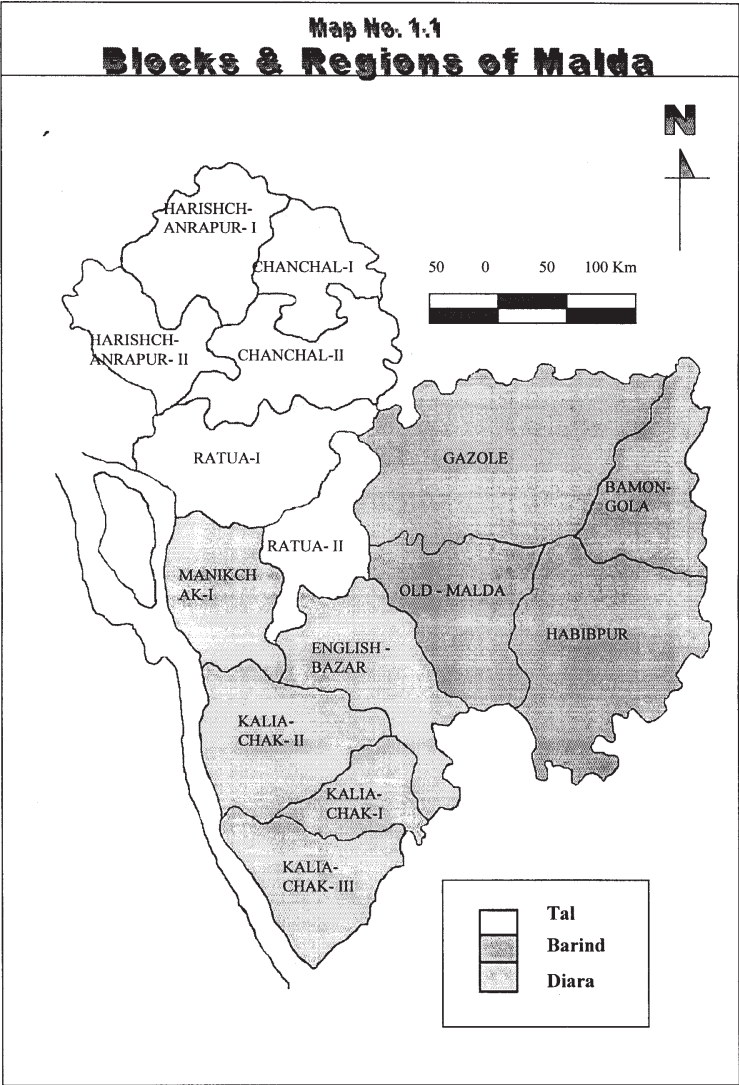| Physiographic Region	TAL	BARIND	DIARA
Blocks	Harischandrapur – I	Gazole	English bazar
	Harischandrapur – II	Bamangola	Manikchak
	Chanchal – I	Habibpur	Kalichak – I
	Chanchal – II	Old-Malda	Kalichak – II
	Ratua – I		Kalichak – III
	Ratua – II		
Nos of Blocks	6 (Six)	4 (Four)	5 (Five)
Total area in hectare	1,14,099	1,12,188	1,32,761

Source :- Agricultural Scenario – P.A.O. Malda (1999)

The low-lying area of the northwestern side of the district is known as '**Tal**'. Comparative highland on the east of Mahananda river is known as the '**Barind**' and the flat land on the western side of the Mahananda is known as the '**Diara**'. Map No-1.1 shows the different regions (with blocks) in this district.

There are certain areas in Malda district which are relatively affluent and the farmers are well to do, while there are other regions in which the rural population, in spite of their hard work, lives in poverty. So a unique feature of the district's agriculture is that production and productivity of various crops vary in different regions. Variation of the cropping pattern too is observed in district. The major determinants of these variations are a number of physical factors like relief, drainage, soil and climate. On the other hand non-physical determinants such as technological factors, population characteristics, cultural factors and infrastructural services also affect productivity.

In the district the farmers lack the knowledge about soil and water conservation, and land management practices are inefficient. Due to low quality of inputs, the farmers get a low return in the form of yield. Poor irrigation facilities, absence of farm building, agricultural machinery, market and lack of farmers' initiative, the district has lagged in respect of agricultural production and productivity.

In the first look these parameters are not likely to vary in any definite pattern within a district as 3,59,048 hectare area of the district is not enough to introduce wide variations. But the pattern of the agricultural production as well as productivity is not uniform in the district. The variations are found mainly due to variation with respect to physical and non-physical determinants.

Map No. 1.1
Blocks & Regions of Malda

N

HARISHCH-
ANRAPUR- I

CHANCHAL-I

50   0   50   100 Km

HARISHCH-
ANRAPUR- II   CHANCHAL-II

RATUA-I   GAZOLE

BAMON-
GOLA

RATUA- II

MANIKCH
AK-I   OLD - MALDA

HABIBPUR

ENGLISH -
BAZAR

KALIA-
CHAK- II

KALIA-
CHAK-I

KALIA-
CHAK- III

Tal
Barind
Diara

b) Scope, Approaches and Objectives

Agricultural productivity in any region is an outcome of the interaction of two main factors – natural and human. The district of Malda is characterised by environmental homogeneity but other physical factors like relief, drainage, soil are markedly different from region to region as well as from block to block. In this district some micro level spatial variations also are found, so studying the pattern of variation of the district in depth is proposed.

Agriculture is by and large of subsistence type in nature. There is no doubt that since independence much progress has been registered in agricultural sector in the state of West Bengal, but the level of productivity in this district lags. The abundance of smaller operational holding in agriculture proved detrimental to the progress. This district produce a wide variety of crops like paddy, wheat, pulses, jute, mango, etc. Due to the weak industrial scenario of the district food crops dominate agriculture and a very insignificant amount of land is utilized for commercial crops like sugarcane, jute, tobacco etc.

In this district rainfall is mainly restricted to the monsoon months, i.e. mid-June to mid-September. Due to the vagaries of monsoon vast areas of this district remain un-irrigated and as a consequence production remains low in different regions. In the last few years floods occurred frequently which not only damaged agricultural crops but also human life, settlements and communication links. Not only flood, drought also affect extensive areas and reduces the agricultural production in this district.

The growth rate of agricultural production in the district is low and the present level of income of the farmers too is not impressive. The low income result in meager savings which in turn result in low investment, weak infrastructure which ultimately result a low marketable surplus in agricultural production, compelling the cultivators to stay in the age-old subsistence level of existence.

In absence of secured irrigation, the farmers are mainly dependant upon grain production like paddy, wheat etc. and very limited portion of the land is devoted to each crop because of limited infrastructure and low demand.

Under the prevailing condition it is important to examine the productivity of individual crops and the spatial variation within the district. It is obvious that agricultural productivity along with cropping pattern varies from one region to another as well from block to block.

The scope of the present study is to determine the variation of productivity of crops within the district and find out the various causes for such variations and accordingly suggest remedial measures.

Such an analysis will help to increase the production as well as the productivity. In order to accelerate development, appropriate strategy based on the causes of backwardness, has to be identified. The planning of irrigation, transportation, communication, storage facilities, marketing and socio-economic changes have to be developed at the block level as well as at the district level.

The present agrarian situation in Malda district has to sustain not only its rural population particularly those directly dependent on agriculture but also has to make agriculture economically viable and attractive. The present study thus aims to indicate different physical and non-physical factors that are originally low in this district and so affect agricultural production as well as productivity. Therefore the main objectives of the study are:

Objectives:

1. To analyse the present status of geo-economic regions of Malda district on the basis of their Physiographic variations.

2. To analyse the present status of agricultural crops in terms of production and productivity as well as their regional variations.

3. To identify various physical and non-physical factors controlling agricultural productivity of different regions.

4. To identify the input-output relationship in the productivity region.

5. To assess the region wise potentialities of crop productivity.

6. To suggest the remedial measures for reducing the regional imbalance and maximizing the production and productivity

c) Methodology

With the objective of analyzing the agricultural productivity and its variation in the district of we propose to analyze secondary data along with the primary data. This section covers i) area of the study, ii) sampling design, iii) primary data collection and iv) primary data management v) analysis approaches of secondary data vi) data sources.
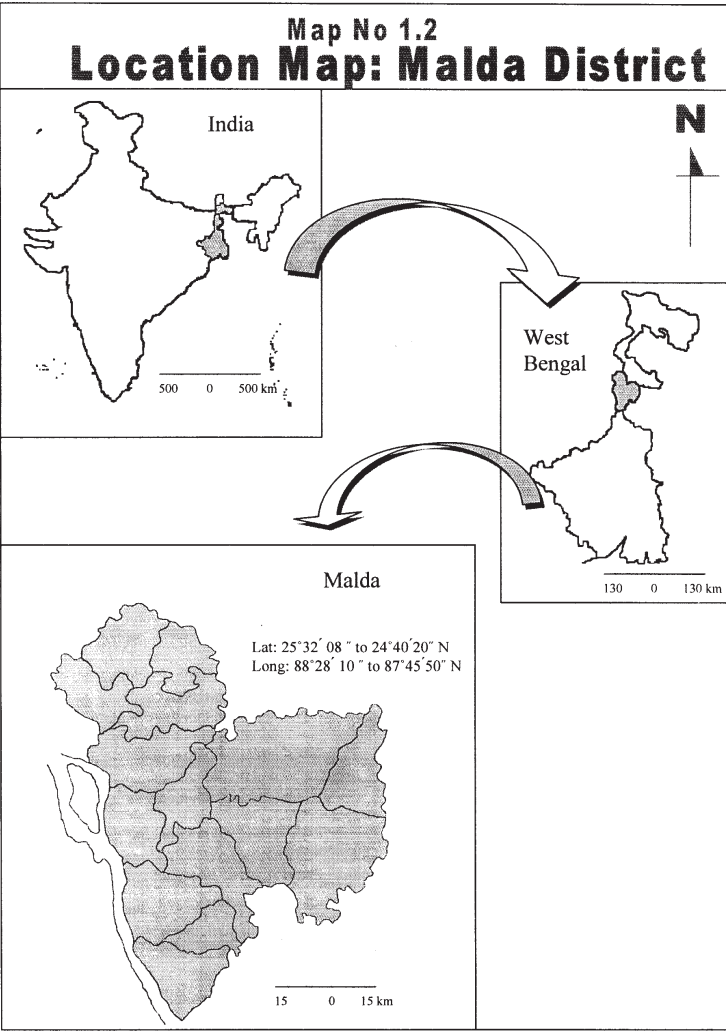
i) Area of the Study:

This study has been carried out in the rural areas of Malda district centrally located in West-Bengal, a state in eastern India. Map 1.2 provides the location map of Malda. This district is primarily a rural district with agriculture as the main source of income. Other than agricultural activities the district has *bidi* and silk industry. The district has an international boundary of 204 km. with Bangladesh and state boundary with Bihar. The other socio-economic profile of the district is provided in Table 1.2.

Table 1.2: Socio-Economic Profile of Malda District

Particulars	Value
Total Area (sq km)	3583
Population (1991)	26,37,032
Male	13,60,541
Female	12,76,491
Urban	24,50,495
Rural	1,86,537
Density (1991) (nos per sq km)	736
Religion (1991) (% of total population)	
Hindu	52.25
Muslim	47.49
Others	0.26

Urban Literacy Rate (1991) (%)	73.11
Rural Literacy Rate (1991) (%)	32.57
Number of female per 100 male	94
Number of Scheduled Caste	4,77,896
Number of Scheduled Tribe	1,71,326
Main Workers as % of Total Population (1991)	31.64

Map No 1.2
Location Map: Malda District

India

N

West Bengal

500   0   500 km

Malda

Lat: 25°32′ 08 ″ to 24°40′20″ N
Long: 88°28′ 10 ″ to 87°45′50″ N

130   0   130 km

15   0   15 km

The district, which is primarily dependant on agriculture, cultivates various crops but in our analysis we will be considering thirteen major crops forming four crop groups. Table 1.3 provides the list of crops and their respective crop groups considered.

Table 1.3: Major crops Cultivated in Malda

Sl no.	Crop Group	Crops
1	Cereals	Aus, Aman, Boro, Wheat
2	Pulses	Arhar, Kalai, Gram, Lentil
3	Oil seeds	Mustard, Linseed
4	Cash Crops	Potato, Mango, Jute

The study uses the secondary data for the period 1993-94 to 2000-01 while the primary survey was conducted in two phases: Phase I: September 14, 2002 to September 28, 2002 and Phase II: March 19, 2003 to March 26, 2003.

ii) Sampling Design:

Keeping the objectives in mind two-stage stratified sampling has been adopted. The district, which has three regions, is divided into fifteen administrative blocks. As per 1991 census the district has 1,641 inhabited villages. Table 1.4 shows the break-up of the number of inhabited villages for the individual blocks.

Table 1.4: Number of Inhabited Villages: Block Wise (1991)

Block	No. of inhabited villages
Harishchandrapur I	104
Harishchandrapur II	72
Chanchal I	99
Chanchal II	85
Ratua I	91
Ratua II	48
Tal	499
Gazole	288

|	
Bamongola	233
Habibpur	141
Old Malda	114
Barind	776
English Bazar	109
Manikchak	74
Kaliachak I	60
Kaliachak II	57
Kaliachak III	66
Diara	366
Malda	1641

Source: Government of India Census, 1991

In the study we have found that, the physical setting in terms of climate is same across the district while structure and relief, drainage and soils vary amongst the regions but these broad parameters are comparatively similar within a region. The blocks within each region vary in terms of socio-economic parameters. With the objective of understanding the variation amongst the blocks the first stage of sampling of villages has been designed.

The villages are sampled out of the strata defined by the blocks; and the desired sample is selected from the sample frame using simple random sampling approach. As regards the minimum number of sample villages to be covered under the study, among all the observations pertaining to a variable, lowest prevalence was anticipated as 40%. Accordingly taking into account 45% relative precision, required minimum sample size came to be 29 at 95% level of confidence. The formula used for this is

$$N = \left(\frac{\left(Z_{(1-\alpha)/2} \right)^2}{L^2} \right) * PQ$$

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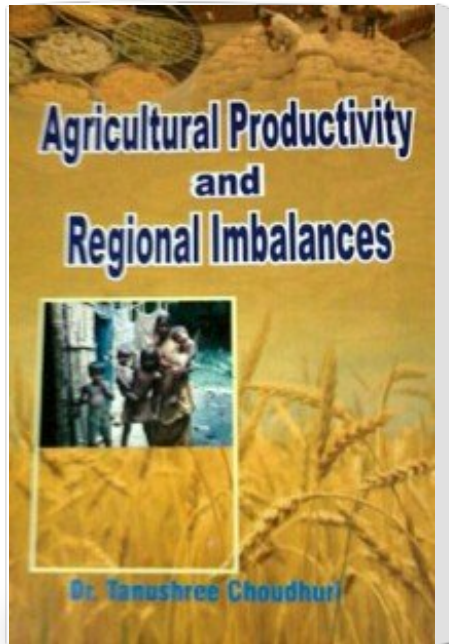
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