

A HEARTIEST TRIBUTE IN THE MEMORY OF MY MOTHER



Late Beli Mandal

STATUTORY DECLARATIONS

I hereby declare that the thesis entitled “*Trends and Patterns of Agricultural Land Use in Maldah District, West Bengal*” is the original research work and has been prepared by me under the guidance and supervision of Dr. Snehasish Saha, Assistant Professor of the Department of Geography and Applied Geography, University of North Bengal. All the materials, including literature, maps, diagrams, photo plates and any other embodied in this thesis, have been submitted by myself. I ensure that no part of this thesis has been submitted for the award of any degree or fellowship previously, except pre-submission publications in peer-reviewed journals to fulfill the need of Ph. D degree partially. The work of other authors or other organizations/agencies that used this study has been duly acknowledged at relevant places with appropriate and possible recognition. The published works, either in the form of direct or indirect utilization, have also been used with proper courtesy. Any mistake in doing so is purely unwanted and unintentional and subject to the proper acknowledgment to the concerned author (s), organization or agency, etc. though there is hardly little chance of that. In every part of the work, the attitude is to establish individuality and uniqueness with the help of the establishment of facts through secondary data sources, published literary works, fieldwork, group discussion, interviews, etc.

Date: 04.11.22

Tapash Mandal

Place: University of North Bengal

(Tapash Mandal)



সমানো মন্থ: সমিতি: সমানী

DEPARTMENT OF GEOGRAPHY & APPLIED GEOGRAPHY

UNIVERSITY OF NORTH BENGAL

Accredited by NAAC with Grade B++

RAJA RAMMOHUNPUR, P.O. NORTH BENGAL UNIVERSITY, DIST. DARJEELING, WEST BENGAL, PIN- 734013
Ph. No. +91-0353-2776342, FAX +91-0353-2699001, URL: www.nbu.ac.in

From: Dr. Snehasish Saha

Date: 04.11.2022

CERTIFICATE

This is to certify that Mr. Tapash Mandal, a Research Scholar of the Department of Geography & Applied Geography, University of North Bengal has carried out his Ph.D. thesis entitled '**TRENDS AND PATTERNS OF AGRICULTURAL LAND USE IN MALDAH DISTRICT, WEST BENGAL**' under my supervision which is being submitted to the University of North Bengal for the award of Doctor of Philosophy (Ph.D.) in Geography & Applied Geography under the faculty of science.

To the best of my knowledge and behalf it is his original research work based on extensive field survey and secondary sources of information done by the researcher.

This thesis as a whole or any part of it has not been submitted to any other University/ Institution for any other degree.

Snehasish Saha

Assistant Professor
Department of Geography &
Applied Geography
University of North Bengal

(Dr. Snehasish Saha)
Assistant Professor
Department of Geography & Applied Geography
University of North Bengal
Raja Rammohunpur
Darjeeling-734013

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1 CHAPTER – I INTRODUCTION

2 1.1 Introduction Geography predominantly deals with the Spatio-temporal distribution of numerous features on the earth's surface. It consists of a wide range of information, so it has been divided into two most important areas of study. The first is physical geography, including the physical environment, soil, landforms, plant, weather, climate, etc. The second is human geography mainly contains human's activities on the earth's surface. Although some branches have developed later on, these were interrelated to each other. Agricultural geography is a branch of physical geography incorporated with the natural environment and human activities. The term agriculture is come from the Latin word 'ager,' which signifying land, and 'culture' meaning land cultivation. Thus, agriculture can be defined as the art and science of cultivating the land for producing crops and nurturing domestic livestock regarding the physical environment and humanoid conditions. The principal aim of agriculture is to increase more productive crops and plants and help them grow by supplying adequate water and fertile soil. However, the term 'Agricultural land use' (ALU) symbolizes the Gross Cropped Area (GCA) computation under different crops during an agricultural year. It is a significant indicator of the appropriate and inappropriate use of land. Various physical factors such as water resource, relief, climate, soils, and socio- economic factors i.e., capital investment, storage, marketing, etc., are influential for any region's ALU pattern. Also, agriculture is a vital sector of the Indian economy and plays a pivotal role in the economic development of a region (Nanaware, 2007). It affords food for the people and raw materials for the industry, thus contributing to overall economic growth. It is also called the milestone in human civilization's history and is considered the backbone of the Indian economy. About 20% of the nation's GDP, about 12% of its exports, and about 58% of India's population still rely on agriculture as its principal source of income and raw material source for industries, especially agro-based (Economic Survey, 2020-21). A good performance of agriculture during a decade helps to faster support and the generation of employment, thereby reducing poverty, hunger, and malnutrition. Thus, the rapid economic development of any region is almost impossible without the development of agriculture. It is the results from the farmers' judgment about the choice of crops and procedures or techniques for production. However, the farmers may be categorized into

Snehasis Saha
09/11/2022

Assistant Professor
Department of Geography &
Applied Geography
University of North Bengal

Tapash Mandal
09/11/22

PREFACE

Agriculture and allied sector of Maldah district provide a source of livelihood for a large number of the population. The district's economy is mainly agrarian and agriculture is the primary source of living for the majority of the population of the district. In this respect, the district's agricultural sectors must be developed to meet the increasing demand for food and livelihood opportunities. One of the major challenges in this sector of the district is confirming the food security of the population. Food availability must be supported by purchasing power of the people. So, the production and productivity of the major crops have to be increased to meet the population's growing demand. Also, the agriculture can play a very important role in generating employment and improving purchasing power of the people. Therefore, it is essential to develop this sector to generate higher income and greater on-farm and off-farm employment opportunities. It is a solid need to study this matter. In the present work, an attempt has been made to analyze the trends and patterns of agricultural land use in Maldah district, West Bengal.

The present study entitled, *Trends and Patterns of Agricultural Land Use in Maldah District, West Bengal*, is a part of the agricultural geography, in which the present researcher tried to explain the trends and patterns of agricultural land use over the period of forty years, i.e., from 1980-81 to 2020-21; the driving forces of agricultural land use change and impact of agricultural land use change on farmers livelihood assets. Also, added some recommendations for sustainable agricultural development in the district. After outlying the objectives and the major theoretical concern and problems of the research, it may be useful to mention the contents of the chapters and how these have been arranged in this thesis. The present study has been designed into eight chapters.

Chapter I comprises *“Introduction”* and starts with the conceptual framework of agricultural geography as well as agricultural land use with the statement of the problems, literature review, objectives, hypothesis, and methodologies. The concept of the sample design and sampling technique used for primary data collection is also included in this chapter.

Chapter II contains, *“Determinants of agriculture in Maldah district”* provides an understanding of the physical and socio-economic determinants of agriculture in the study area. The physical determinants comprise physiography, water resources, soils,

and climate. In contrast, socio-economic determinants contain demographic factors, occupational structure, land holding pattern, irrigation, agricultural equipment, chemical fertilizers and connectivity and accessibility. The determinants have been analyzed carefully and show a clear relation with agrarian activities in the district.

Chapter III encompasses ***“Land use pattern and changes therein,”*** which infers the Spatio-temporal changes in the land use pattern of the study area with a 20 years duration, i.e., from 1980 to 2001 and 2001 to 2021. This chapter revealed that the agricultural land in the study area had decreased significantly. On the contrary, the vegetation cover and built-up area have increased. The block-level conversion of one land use to another has also been discussed in this chapter.

Chapter IV includes ***“Spatio-temporal changes in agricultural land use pattern,”*** highlights the trends and magnitudes of change in the area, production and yield under nine major crops (winter rice (aman), summer rice, wheat, maize, lentil (masoor), urad (maskalai), rapeseed & mustard, jute and potato) and four minor crops (autumn rice (aus), gram, khesari and sugarcane) in the study area. Blockwise relative deviation of the crops has also been discussed in this chapter. Agricultural regionalization in terms of crop ranking, crop combination, crop diversification, crop concentration and cropping intensity and their changing pattern have also been studied here. Significant increasing trends were observed for summer rice (boro), maize, urad (maskalai), rapeseed & mustard, and potato. On the other hand, a significant decreasing trend was observed for autumn rice (aus), gram, khesari and jute.

Chapter V covers ***“Cost-benefit analysis of major crops,”*** which deals with the farmer's perceptions about the cost and return of the major crops of the district. The socio-economic characteristics of the farmers have also been evaluated in this chapter. The farm size-wise cost and return of the major crops of the district were examined. Finally, it compared the different cost and return among the marginal, small and large farmers. The analysis revealed that potato cultivation obtained the highest average gross and net profit. However, return to operating cost and total cost were observed for maize production.

Chapter VI contains ***“Driving forces of agricultural land use change based on farmers perception”*** and deals with the farmer's opinion about the driving forces of agricultural land use change. However, four major drivers and forty triggering variables were identified and ranked them using Analytical Hierarchy Process (AHP) to get the most significant driver of agricultural land use change. The AHP revealed scarcity of big

ponds/water reservoirs is the main driver of agricultural land use change for marginal farmers, inaccessibility to the road for small farmers and inadequacy of labour for large farmers from the economic drivers. On the other hand, in socio-cultural drivers, neighbour cultivation for marginal farmers, growing demand for small farmers and higher education for large farmers played significant roles in agricultural land use change.

Chapter VII comprises, *“Impacts of agricultural land use change on farmer’s livelihood assets,”* attempts to analyze the significant impacts of agricultural land use change on farmer’s livelihood assets using the perception index technique. The effects of agricultural land use change have also been made based on farmer’s perceptions. As per marginal, small and large farmers, the financial assets were more influenced by agricultural land use change. More precisely, household amenities like TV and other electronic equipment have been increased due to profitable turnovers resulting from agricultural land use change as per marginal farmers; for small farmers, the production cost has been increased. For large farmers, their cash income has been increased due to surplus income from the agricultural land use change.

Chapter VIII includes *“Summary and conclusion,”* which deals with the major findings of the study, ultimate inferences on the testing of hypotheses, major problems of the agricultural land use change and some recommendations for sustainable agricultural development in the district.

Date: 04.11.22

Place: University of North Bengal

Tapash Mandal

(Tapash Mandal)

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Date: 04.11.22

Tapash Mandal

Place: University of North Bengal

(Tapash Mandal)

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