Dedicated to

My beloved parents (Sri Sunil Kumar Ghosh and Smt. Chandra Ghosh), wife (Rinku Saha) and dear Son (Sounak Ghosh)

समानो मन्त्रः समितिः समानी

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: 13th December 2023.

CERTIFICATE

This is to certify that **Mr. Subrata Ghosh**, a Research Scholar of the Department of Geography & Applied Geography, University of North Bengal has carried out his Ph.D. thesis titled "*AGRICULTURAL TRANSFORMATION AND ITS IMPACT ON SOCIO-ECONOMIC CONDITIONS OF THE FARMERS: A CASE STUDY OF UTTAR DINAJPUR 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 belief 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

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

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

Email: snehasishsahanbu1979@gmail.com/snehonbugeo09@nbu.ac.in | Mobile & WhatsApp: +91 9064761296

DrillBit

The Report is Generated by DrillBit Plagiarism Detection Software

Submission Information

Author Name	Subrata Ghosh
Title	AGRICULTURAL TRANSFORMATION AND ITS IMPACT ON SOCIOECONOMIC CONDITIONS OF THE FARMERS: A CASE STUDY OF UTTAR DINAJPUR DISTRICT, WEST BENGAL
Paper/Submission ID	1200951
Submitted by	nbuplg@nbu.ac.in
Submission Date	2023-12-12 12:10:51
Total Pages	281
Document type	Thesis

Result Information

Similarity **0 %**

Exclude Information

Quotes	Excluded
References/Bibliography	Excluded
Sources: Less than 14 Words %	Not Excluded
Excluded Source	**4 %**
Excluded Phrases	Not Excluded

Database Selection

Language	English
Student Papers	Yes
Journals & publishers	Yes
Internet or Web	Yes
Institution Repository	Yes

A Unique QR Code use to View/Download/Share Pdf File

Subrata Ghosh 13/12/2023

Prakash Saha 13/12/2023

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

Preface

The preface provides an overview of the chapters comprising the thesis, outlining their content and significance. Each chapter elucidates a distinct facet of agricultural transformation, utilizing a combination of empirical data, analysis, and expert insights. This thesis presents an in-depth exploration of the agricultural transformation taking place in Uttar Dinajpur district, West Bengal, India. The district's agricultural landscape has undergone significant changes, transitioning from traditional cropping practices to more commercially oriented ones. The following chapters systematically analyze various aspects of this transformation, shedding light on its causes, impacts, and future prospects.

The introductory chapter lays the foundation for the study by highlighting the crucial role of agriculture in the Indian economy and its impact on livelihoods. The distinction between the pre-green revolution and post-green revolution eras sets the context for understanding the shifts in agricultural practices. The chapter outlines the research objectives and hypotheses that guide the investigation.

Chapter II provides an insightful overview of the geographical attributes of Uttar Dinajpur district. It delves into the historical context of its formation and elaborates on its geographical area, topographical features, climate, soil types, and hydrology. This chapter aims to offer a comprehensive understanding of the physical attributes shaping the district's agricultural landscape.

The third chapter focuses on the underlying causes driving the ongoing agricultural transformation. Through a detailed questionnaire survey, this chapter uncovers the motivations behind farmers' decisions to shift from traditional crops to transforming crops. Economic incentives, higher production, cropping periods, and ease of cultivation are examined as key factors influencing this transition.

This chapter delves into a comprehensive analysis of the impacts arising from the ongoing agricultural transformation within Uttar Dinajpur district. As the district undergoes shifts in its crop patterns and farming practices, it is essential to understand how these changes ripple through various dimensions of the agricultural landscape and the broader socio-economic context.

Furthermore, the socio-economic impact of agricultural transformation is meticulously assessed. This includes an evaluation of changes in income distribution, employment patterns, and the overall economic vitality of the district. The chapter delves into the potential benefits reaped by farmers who have adopted transforming crops, such as enhanced earnings, improved living standards, and increased access to markets.

Chapter V explores farmers' perceptions and opinions regarding the ongoing agricultural transformation. By engaging directly with farmers, this chapter captures their viewpoints on the changing practices, benefits, and implications for their livelihoods. The voices of the farming community offer a ground-level understanding of the realities of agricultural transformation.

In Chapter VI, the study delves into the production trends of major crops in the district. It analyzes production data to reveal significant shifts in output levels for crops like rice, wheat, maize, and mustard. This chapter unveils the trends in production growth, decline, and transformation, reinforcing the narrative of agricultural transformation.

Chapter VI delves into the changing land use patterns within the district. The chapter uses historical data to illustrate the shifting proportions of various crops over time, emphasizing the growth of transforming crops while traditional ones wane. This spatial and temporal analysis provides insights into the evolving cropping patterns at the block level.

Chapter VII employs forecasting models to project future trends in crop production within the district. Through the application of the ARIMA model, this chapter offers insights into the potential trajectory of agricultural transformation in the upcoming years. It serves as a valuable tool for policymakers and stakeholders seeking informed decisions.

The chapter VIII identifies the challenges and constraints that hinder the smooth progression of agricultural transformation. It investigates issues such as inadequate irrigation, middlemen interference, pesticide overuse, and marketing complexities. By delving into these challenges, the chapter sheds light on obstacles that require strategic interventions for sustainable agricultural growth.

Chapter IX builds on the challenges discussed in the preceding chapter by presenting actionable suggestions to overcome constraints and promote sustainable agricultural transformation.

Recommendations encompass strategies for improving irrigation, marketing, training, and technology adoption, all of which contribute to a balanced shift towards transforming crops

The concluding chapter synthesizes the study's findings and derives meaningful conclusions. It encapsulates the implications of agricultural transformation for Uttar Dinajpur district, weighing the positive and negative aspects. The chapter not only summarizes the research but also lays the groundwork for future studies and policy considerations in the realm of agricultural development.

This thesis aspires to contribute to the understanding of agricultural transformation dynamics in Uttar Dinajpur district, offering valuable insights for policymakers, researchers, and stakeholders working towards sustainable agricultural growth and rural development.

Place: NBU

Date: 13/12/2023

Subrata Ghosh.

(Subrata Ghosh)

Acknowledgements

I bend over in veneration to the Almighty God whose benevolent blessing gave me the required ardour for completion of this work.

I do not find germane words to articulate my thoughtful gratitude and indebtedness tomy supervisor **Dr. Snehasish Saha,** Associate Professor, Department of Geography and Applied Geography, University of North Bengal, Darjeeling for his stupendous guidance, well-timed criticism, suggestions and all the assistance in carrying out this study. To Sir, I humbly offer my deepest sense of gratitude, something that cannot be simply expressed in words, for giving opportunity to pursue the research under his supervision, for not losing faith when I often digressed from instructions, dallied over work and no doubt infuriated within correct observations. It is impossible to complete this thesis without his guidance and suggestions.

I am also very thankful to **Prof. Subir Sarkar**, Professor, Department of Geography& Applied Geography, University of North Bengal, Darjeeling for his timely criticism, encouragement and support behind the completion of the work.

I am also indebted to **Dr. Indira Lama** Associate Professor, Department of Geography and Applied Geography, University of North Bengal, Darjeeling for her fathomless denunciation, motivation and co-operation during the time of registration, authentic suggestions during the entire study. I need to express my sincerest respect to my beloved teachers **Prof. Deepak Kumar Mandal, Prof. Sushma Rohatagi, Prof. Ranjan Roy, Dr. Suman Sao, Dr. Sudip Kumar Bhattacharya, Dr. Arindam Basak, Dr. Rupak Kumar Paul, Dr. Indrajit Roy Chowdhury, Late Dr. Surjapada Paul** and **Dr. Riti Moktan** without whose guidance and help, my thesis could have been incomplete. I am also indebted to the entire family members of Dept. of Geography & Applied Geography.

I am grateful to the Staffs, Office bearers and Librarians of National Atlas and Thematic Mapping Organization (NATMO), Survey of India (SOI), The Geological Survey of India(GSI), River Research Institute, National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), National Library, Central Ground Water Board (CGWB), All India Soil and Land Use Survey, Regional Census Office of West Bengal, Central Library of University of North Bengal and Seminar Library of the Department of Geography Applied Geography, University of North

Bengal and Central Water Commission (Bhubaneswar),S tate Water Investigation Directorate (SWID), Director of Agriculture(Admin) and Soil Conservation, DPAP of Purulia, Department of Tea Science of University of North Bengal for their assistance in procuring the varied cum collecting and possible data required for this thesis.

I am also grateful to the Dr. Baidurya Biswas, Mr. Tapash Mandal, Mr. Tanmoy Thokdar, Mr. Kunal Chakroborty, Mr. Mantu Das, Mr. Saidur Rahaman, Mr. Sujoy Kumar Malo, and Mr. Debasish Mandal Research Scholars, University of North Bengal for their insightful observations and support during compilation of thesis.

Finally, I am grateful to My beloved parents Sri Sunil Kumar Ghosh and Smt. Chandra Ghosh for their immeasurable love, encouragement and inexhaustible help and to all my friends who may not have understood what I was doing but understood me while I was doing it, - "thank you".

Place: NBU

Date: 13/12/2023

Subrata Ghosh.

(Subrata Ghosh)

Statutory declaration

All the materials including literatures, maps, diagrams, plates, and any information embodied in this thesis "***Agricultural transformation and its impact on socio-economic conditions of the farmers: a case study of Uttar Dinajpur district, West Bengal***" being submitted by myself (Subrata Ghosh) under the supervision of Dr. Snehasish Saha, Associate Professor, Department of Geography & Applied Geography, University of North Bengal to the Dept. of Geography & Applied Geography, University of North Bengal, Raja Rammohunpur, P.O. NBU, District Darjeeling, Pin-734013, West Bengal. This thesis is in all aspects original and has not been submitted in part or full for any other diploma or degree fellowship or any other similar title or recognition except few parts for peer reviewed journals to partially fulfill the need of pre Ph.D. publication. The work of other authors or any other organizations/agencies wherever made use of, in this study have 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 subject to the proper acknowledgement 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 establishment of fact through secondary data sources, published literary works, field work, group discussions, interviews etc.

Date: 13/12/2023

Subrata Ghosh.

Place: NBU

(Subrata Ghosh**)**

List of abbreviation

ACF	Auto correlation functions
AOI	Area of interest
AR	Auto regression
ArcGIS	Aeronautical reconnaissance coverage geographic information system.
ARIMA	Autoregressive integrated moving average
ATA	Agricultural transformation agenda
BIC	Bayesian information criterion
CAGR	Compound annual growth rate
CBA	Cost benefit analysis
DTW	Deep tube well
ECA	The economic commission for Africa
ERDAS	Earth resources data analysis system
FGD	Focus group discussion
GCA	Gross cropped area
GeoTIFF	Geographic tagged image file format
GOI	Government of India
HDTW	High capacity deep tube well
HVA	High value agricultural products
J.L	Jurisdiction list
K	Potash
LCL	Lower control limit
LDTW	Low capacity deep tube well
LULC	Land use land cover
MA	Moving average
MDTW	Middle capacity deep tube well
N	Nitrogen
N.O.C	No objection certificate
NB	North Bengal
NTFP	Non-timber forest products

ODW	Open dug well
OLI	Operational land imager
P	Phosphate
PACF	Partial auto correlation functions
RLI	River lift irrigation
SHG	Self-help groups
SID	Simpson’s index of diversification
STGs	Small tea growers
STW	Shallow tube well
TIRS	Thermal infrared sensor
TM	Thematic mapper
UCL	Upper control limit
USDA	United states department of agriculture
USGS	United states geological survey
UTM	Universal transverse mercator
VIP	Vietnam, Indonesia and the Philippines
WGS	Whole genome sequencing

List of Tables

List of Figures

List of Photographs