

# Contents

		<i>Page No.</i>
Acknowledgement		i
List of Maps & Figures		ii – v
List of Tables		vi
List of Abbreviation		vii – viii
Glossary		vii – viii
<b>Chapter-I</b>	<b>Introduction</b>	<b>1 – 50</b>
1.1	Background of the Study	6
	1.1.1. Agricultural Systems in pre-Colonial and Colonial Period	6
	1.1.2. Agricultural Systems in post-Independence Period	7
1.2	Statement of the problem	11
1.3	A Review of Related Literature	16
	1.3.1. Research on Agriculture during Colonial Era	17
	1.3.2. Farm Size, Productivity and Land Reform	21
	1.3.3. Trends in Agricultural Production and Productivity in post-Independence Period in India	23
	1.3.4. Sources of Growth of Agricultural Production and Productivity	25
	1.3.5. Growth Instability in Crop Production	27
	1.3.6. Farm and non-Farm Interaction	28
	1.3.7. Institutional Reforms in West Bengal	29
	1.3.8. Trends in Production and Productivity in West Bengal	31
1.4	Research Gap	33
1.5	Research Questions	34
1.6	Hypotheses of the Study	35
1.7	Methodology	35
	1.7.1. Measuring Growth of Crop Output, Productivity and Area	36
	1.7.2. Acceleration and Deceleration of Growth	36
	1.7.3. Measuring Growth in Sub-Periods: Kinked Exponential Model	37
	1.7.4. Weather or Rainfall Adjusted Growth Rate	37
	1.7.5. Measuring Instability of Growth Rate	37
	1.7.6. Measuring Crop Diversification	38
	1.7.7. Standard Pooled Regression	39
1.8	Chapterisation of the Study	39
<b>Chapter-II</b>	<b>Agrarian Relations and Agriculture in Bengal in Retrospect</b>	<b>51 – 83</b>
2.1	Introduction	51
2.2	An Overview of Agriculture during pre-Colonial Era	51
	2.2.1. Tenurial Relations, Agrarian Structure, Peasantry and the Economy in the pre-Colonial Era	52
2.3	An Overview of Agriculture during Colonial Era	55
	2.3.1. Evolution of Tenancy System in Bengal during Colonial Period in pre-Permanent Settlement Era	56
	2.3.2. The Permanent Settlement	57
	2.3.3. The Impact of Permanent Settlement and Bengal Tenancy Act on Agrarian Bengal	61
2.4	Agriculture during the British Raj: A Critical Review	65
	2.4.1. The Land of Agricultural Prosperity: New Delta and the Ganges-Brahmaputra <i>Doab</i>	66
	2.4.2. The Land of Agricultural Decline: The Ecological Zone of the Old Delta	66
	2.4.3. Decline in Agriculture in Bengal in the 20 <sup>th</sup> Century: Probable Causes and Consequences	67

2.5	Post-Independence Era	70
2.5.1	Abolition of <i>Zamindari</i> System in India	71
2.5.2	Tenancy Reforms	73
2.5.3	Imposition of Ceilings on Landholdings	74
2.6	Tenancy Reforms in West Bengal in post-Independence Period	77
2.6.1	Land Reforms Act 1955: Definition of Share Cropper	77
2.6.2	Land Reforms Act (Amendment), 1966	78
2.7	Conclusion	80
<b>Chapter-III</b>	<b>Trends in Agricultural Production and Productivity: An Inter-State Comparison</b>	<b>84 – 116</b>
3.1	The Indian Experience	84
3.2	Agricultural Policies in post-Independence Era (1947 to 1960)	85
3.2.1	Agricultural Policies from late-1960s to 1980s	85
3.2.2	Agricultural Policies in the 1980s and during the period of Economic Liberalisation (1991 to the recent)	86
3.3	Growth Performance of Production, Productivity of Major Crops in India in post-Independence Period	88
3.3.1	Growth in Area, Production and Productivity from 1949-50 to 1964-65 (pre-Green Revolution Period)	92
3.3.2	Growth in Production, Area and productivity from 1967-68 to 1979-80 (early-Green Revolution Period)	92
3.3.3	Growth in Production, Area and Productivity from 1980-81 to 1989-90 (late-Green Revolution Period)	94
3.3.4	Growth in Production, Area and Productivity from 1990-91 to 2007-08	94
3.4	Crop Diversification at all-India Level	96
3.5	Inter-State Comparison of Growth of Major Crops in India over Different Sub-Periods	97
3.5.1	Production of Major Crops in India: An Inter-State Comparison	98
3.5.2	Compound Annual Growth Rates in Production and Productivity of Foodgrains in India: An Inter-State Comparison	102
3.5.3	Inter-State Long Term Growth Patterns in Area, Production and Productivity of Major Crops in India	105
3.5.4	Growth in Foodgrain Production and Growth of Population (1960-61 to 2007-08): An Inter-State Comparison	111
3.6	Conclusion	114
<b>Chapter-IV</b>	<b>Trends in Agricultural Productivity in West Bengal: An Overview of Districts</b>	<b>117 – 154</b>
4.1	Introduction	117
4.2	West Bengal: A Physiographic Description	117
4.3	Agro-climatic Zones in West Bengal	118
4.3.1	Eastern Himalayan Region	118
	a. Hills Sub-Region	
	b. Terai Sub-Region	
4.3.2	Lower Gangetic Region	119
	a. Old Alluvium Sub-Region	
	b. New Alluvium Sub-Region	
	c. Coastal Saline Sub-Region	
	d. Red Lateritic Sub-Region	
4.3.3	Eastern Plateau and Hill Region	120

4.4	Performance of West Bengal in Agriculture: A Review	122
4.5	Methodological Issues on Measurement of Growth	125
4.6	Districtwise Foodgrain Production as Percentage of State's Foodgrain Production: The Changing Scenario	127
4.7	Share of Rice Production to Total Foodgrain Production: A Districtwise Comparison	128
4.8	Districtwise Variation in Rice Production as Percentage to State's Foodgrain Production (1970-71 to 2008-09)	130
4.9	Productivity Trend in Foodgrain and Rice (1970-71 to 2008-09): Inter-District Analysis	132
4.10	Estimated Growth Rates in Agricultural Production: Cropwise and Districtwise Disaggregated Estimation	139
4.10.1	Inter-District Comparison of Growth in Production and Productivity of Foodgrain in West Bengal	140
4.11	Inter-Districts Comparison of Growth in Production and Productivity of Rice in West Bengal	145
4.12	Inter-District Comparison of Growth in Production and Productivity of Wheat in West Bengal	149
4.13	Conclusion	153

**Chapter-V Agricultural Growth: Variability and Instability in Production and Productivity of Foodgrains and Non-Foodgrains in West Bengal 155 – 184**

5.1	Introduction	155
5.2	Methodology of the Study	155
5.2.1	Growth Measurement over Sub-Periods	155
5.2.2	Acceleration and Deceleration in Growth Rates	156
5.2.3	Weather Adjusted Growth Rates	156
5.2.4	Measuring Instability of Growth in Agricultural Production	156
5.3	Aus, Aman and Boro in West Bengal	157
5.3.1	Trends in Production, Productivity and Area under Cultivation of Aman, Aus, Boro in West Bengal	159
5.4	Districtwise Acceleration and Deceleration in Growth in Production of select Foodgrains in West Bengal from 1970-71 to 2008-2009	163
5.5	Weather Adjusted Growth Rate	167
5.6	Growth Instability in Production and Productivity of Select Foodgrains	170
5.7	Trends in Production and Productivity of Non-Foodgrains in West Bengal	172
5.7.1	Changes in Percentage of Area under Various Non-Foodgrains in West Bengal from 1970-71 to 2008-09	172
5.7.2	Kinked Exponential Growth in Production of Select Non-Foodgrains	174
5.7.3	Kinked Exponential Growth in Productivity of Select Non-Foodgrains	176
5.7.4	Kinked Exponential Growth in Area of Select Non-Foodgrains	177
5.7.5	Acceleration and Deceleration in Growth in Production, Productivity and Area of Select Non-Foodgrains in West Bengal from 1970-71 to 2008-09	178
5.7.6	Instability in Production and Productivity of Select Non-Foodgrains in West Bengal from 1970-71 to 2008-09	180
5.8	Conclusion	180

<b>Chapter –VI</b>	<b>Crop Diversification in the Districts of West Bengal: Empirical Evidences and Disaggregated Analysis</b>	<b>185 – 214</b>
6.1	Introduction	185
6.2	The Dynamics of Change in Cropping Pattern in West Bengal	188
	6.2.1 Changes in Cropping Pattern	189
	6.2.2 Cropping Intensity	191
6.3	Diversification and Growth in Crop Output in West Bengal: A State Level Analysis	193
6.4	Components of Growth of Crop Output in West Bengal: Area Effect and Yield Effect	194
6.5	Magnitude and Extent of Crop Diversification in West Bengal: A Disaggregated District Level Analysis	198
6.6	Temporal and Spatial Shifts in Area Share of Major Crops at District Level in West Bengal	203
6.7	Factors Affecting Crop Diversification: Drivers and Constraints	208
6.8	Conclusion	212
<b>Chapter-VII</b>	<b>Driving Factors of Agricultural Productivity in West Bengal: Agriculture, Employment and Economy Interrelationship</b>	<b>215 – 248</b>
7.1	Introduction	215
7.2	Methodology to Measure the Impact of Various Factors on Foodgrain Productivity	218
7.3	Interpretation of the Regression Results (Equation 1)	220
7.4	Methodology to Measure the Simultaneous Impact of Operation Barga and Green Revolution	221
7.5	Interpretation of the Regression Results (Equation 2, 3, 4 and 5)	223
7.6	Role of Irrigation in Augmenting Agricultural Productivity	227
7.7	Agricultural Productivity and its Impact on Employment and Economy	228
	7.7.1 Sectoral Growth of GSDP (at 1993-94 Prices) from 1980-81 to 2009-10	230
	7.7.2 Districtwise Change in Employment Scenario in West Bengal	235
	7.7.3 Changing Land Holding Pattern and Emerging Agrarian Structure in West Bengal	240
7.8	Conclusion	244
<b>Chapter-VIII</b>	<b>Summary and Conclusions</b>	<b>249 – 264</b>
	<b>Bibliography</b>	<b>265 – 278</b>