

India Studies in Business and Economics

Madhusudan Ghosh  
Debashis Sarkar  
Bidhan Chandra Roy *Editors*

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# Diversification of Agriculture in Eastern India

 Springer

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Madhusudan Ghosh • Debashis Sarkar  
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Editors

# Diversification of Agriculture in Eastern India

 Springer

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# Preface

Indian agriculture has been diversifying from cereals to high-value crops and live-stock products in accordance with the changing consumption pattern in favour of livestock, fruits and vegetables. The production strategy has been changing to encourage diversification of the production system without sacrificing the basic obligation of ensuring food security. Diversification of agriculture generates greater employment opportunities and higher incomes for farm households. Indian agriculture in general and Eastern India in particular, have been facing the challenges of the new economic regime, besides the usual problems of rising population, unemployment and poverty; declining investment in agriculture and degradation of natural resources. Diversification of agriculture may help to overcome these overriding problems in a more competitive environment.

This edited volume examines various aspects of agricultural diversification in Eastern India, namely, the rationale and extent of diversification, the nature and problems of diversification, food and livelihood security through diversification, etc. These issues are discussed against the background of significant structural transformation of the Indian economy from agriculture to non-agriculture (services and industry) and changing cropping pattern from cereals to non-cereals associated with changing consumption pattern.

This volume includes 19 chapters, besides an Introduction, covering various aspects of diversification of agriculture in Eastern India with special reference to the states of Assam, Bihar, Jharkhand, Orissa and West Bengal. The papers are organised into three parts, each part including a set of articles dealing with a particular issue of agricultural diversification. Earlier versions of the papers were presented at the 'Regional Seminar on Diversification of Agriculture in Eastern India', organized by the Agro-Economic Research Centre, Visva-Bharati in collaboration with the Indian Society of Agricultural Economics (ISAE), Mumbai and National Bank for Agriculture and Rural Development (NABARD) during March 23-25, 2012. We are thankful to ISAE and NABARD for sponsoring the Seminar.

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Visva-Bharati, Santiniketan

Madhusudan Ghosh  
Debashis Sarkar  
Bidhan Chandra Roy

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# Chapter 1

## Introduction

**Madhusudan Ghosh, Debashis Sarkar and Bidhan Chandra Roy**

Diversification of agriculture is considered as an important strategy to overcome the challenges faced by many developing countries. Diversification of agriculture means developing a larger-number crop mix or enterprise mix in favour of high-value and more remunerative enterprises. It may be of different forms such as supplementing farm incomes with non-farm incomes, increasing the number of crops grown and types of livestock reared, or use of resources in diverse farm enterprises. The prominent arguments in favour of diversification of agriculture are to increase farm income, generate additional employment, stabilize farm income overtime, and to conserve natural resources.

Diversification has been pursued in many countries as a way to improve the long-term viability of agriculture by enhancing the profitability and overall stability of the sector. The shift to other crops or economic activities, however, has not been an easy undertaking, particularly for small farmers. Government assistance in terms of more supportive policies and better infrastructure has played a significant role in the promotion of diversification programmes. With globalisation further stimulating trade, diversification of agriculture afforded greater opportunities for expanding the range of agricultural products that one can market abroad. However, expanded trade has also brought with it higher competition and hence the need to focus diversification programmes on agricultural activities where they have a competitive advantage.

Indian agriculture has been diversifying from cereals to high-value crops and livestock products since the early 1990s. With high economic and population

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growth, the dietary pattern in India is also changing fast. The food basket is diversifying in favour of livestock, fruits, and vegetables. In response to these demands, the crop mix is changing in favour of commercial crops and from low- to high-elasticity commodities. Yet, producing additional diversified food is a major challenge when resources are limited and degrading. To meet the challenge, the production strategy should be to encourage diversification of the production system without sacrificing the basic obligation of ensuring food security.

The changing cropping pattern is thought to be due to the interactive effects of many factors, such as: (1) resource-related factors like irrigation, rainfall, and soil fertility; (2) technology-related factors including not only seed, fertilizer, and water technologies but also those related to marketing, storage, and processing; (3) household-related factors including food and fodder self-sufficiency requirement, and investment capacity; (4) price-related factors covering output and input prices as well as trade policies and other economic policies that affect these prices either directly or indirectly; (5) institutional and infrastructure-related factors covering farm size and tenancy arrangements, research, extension and marketing systems, and government regulatory policies.

The relative importance of these factors has, however, been changing over time. Indian agriculture is increasingly being influenced by economic factors. This is not surprising because irrigation expansion, infrastructure development, penetration of rural markets, development and spread of short duration and drought resistant crop technologies have contributed to minimizing the role of non-economic factors in crop choice of even small farmers. Moreover, the reform initiatives undertaken in the context of ongoing agricultural liberalisation and globalisation policies since the early 1990s have strengthened the role of price-related economic incentives in determining crop composition both at the micro and macro levels. Obviously, such a changing economic environment will also ensure that government price and trade policies will become powerful instruments for directing area allocation decisions of farmers, aligning thereby the crop pattern changes in line with the changing demand-supply conditions. In a condition, where agricultural growth results more from productivity improvement than from area expansion, the increasing role that price-related economic incentives play in crop choice can also pave the way for the next stage of agricultural evolution, where growth originates more and more from value-added production.

It has been reported that agricultural diversification generates higher incomes for farm households, and greater employment opportunities, particularly for women. The shift in land area from cereals to vegetables, in particular, has enhanced employment opportunities in rural areas. (Joshi 2005; Joshi et al. 2004, 2006; Vyas 1996). However, the combination of a large number of small farmers, poor rural infrastructure, and fragmented and underdeveloped markets complicates establishment of efficient and equitable links between farmers and the diverse, emerging domestic market. Indian agriculture, in general and eastern India in particular, is facing the complex challenge of the new economic regime, besides the usual problems of rising population, unemployment and poverty, declining investment in the agricultural sector,

and degradation of natural resources. Diversification of agriculture may help to overcome these overriding problems in a more competitive environment.

Diversification of agriculture also assumes significance in the context of significant structural change of the Indian economy from agriculture to non-agriculture (services and industry); the contribution of the agricultural and allied sector to gross domestic product (GDP) declined from 32.2% in 1990–1991 to about 15% in 2009–2010. However, despite the declining share of agriculture in GDP, the importance of this sector can hardly be over emphasised in view of the fact that this sector still absorbs an overwhelming majority of the workforce. Naturally, the standard of living of a large section of the rural population depends significantly on the performance of this sector.

Agricultural diversification assumes special significance in eastern India because of the fact that the planning commission has given special emphasis in bringing second green revolution to this region. Diversification of agricultural production and marketing offers the opportunity to strengthen lagging growth in farm output and rural employment in this part of India. However, achieving diversified growth with equity requires new measures to increase investment and provide the market institutions needed to develop eastern India's inefficient food processing and marketing sectors, and to ensure that the transformation to high-value agriculture is inclusive of the region's large number of marginal and small farmers as well as landless labourers.

In this context, it is useful to examine the following emerging issues in agricultural diversification in eastern India: (1) rationale for diversification; (2) nature and extent of diversification in various production systems; (3) scope for horizontal and vertical diversification towards high-value crops as well as non-farm activities; (4) determinants of diversification; (5) constraints (agro-ecological/technological/socioeconomic) in realizing the potential benefits of diversification; (6) possible impacts of diversification on different livelihood groups; (7) institutional arrangements (e.g., contract farming, micro-finance, land acquisition norms, and crop insurance) to promote diversification; and (8) policy interventions in terms of price protection, development of rural infrastructure particularly market and storage, land ceiling and tenancy act needed to promote diversification of agriculture.

The chapters included in this edited volume examine various aspects of agricultural diversification in eastern India with particular reference to the states of Assam, Bihar, Jharkhand, Orissa, and West Bengal. This volume is organised in three parts, each part dealing with a set of emerging issues in agricultural diversification. Earlier versions of the volume were presented at the 'Regional Seminar on Diversification of Agriculture in Eastern India', organised by the Agro-Economic Research Centre, Visva-Bharati, in collaboration with the Indian Society of Agricultural Economics (ISAE), Mumbai, and National Bank for Agriculture and Rural Development (NABARD) during March 23–25, 2012. The major findings of the volume are summarised in the following parts.

## 1.1 Part I

Part I includes seven chapters on various issues relating to rationale and extent of agricultural diversification. K. G. Karmakar and B. B. Sahoo, in their chapter on 'Green Revolution in Eastern India', have discussed the role of various stakeholders in the overall agricultural growth strategy in the eastern region. They argue that the eastern India is relatively backward in terms of crop diversification and crop productivity. Non-viability of the small farms, inadequacies in the available inputs, extension services, marketing systems, and infrastructure have been found to be the primary reasons behind the continuing low productivity and poverty syndrome and enhanced regional disparities in this region. Changes in institutional arrangements in the land tenure system such as land leasing, contract farming, and corporate farming could make small farms economically viable. Further, by involving the corporate sector in agri-business and value chain innovations, meaningful employment opportunities could be generated for educated youth. With the State Governments as facilitators in eastern India, the small and marginal farmers, the corporate sector and all financial institutions can work together towards mutual prosperity, besides ensuring food security. By forging strategic alliances with key stakeholders, the corporate sector can provide a sound business framework, which could be a panacea for the ills of the agriculture sector in general and the small and marginal farmers in eastern India, in particular. Recognising the gap between available potentials and actual growth achieved in agriculture in the eastern region, the action plan suggested here to integrate small and marginal farmers, quality inputs supply, output markets, and supply chains could be useful in the utilisation of fund created for bringing Green Revolution in eastern India. The chapter on 'Diversified Sustainable Agriculture in Eastern India' by T. K. Chakrabarty has stressed that farmers' mind set needs to be changed towards the knowledge-based thinking like that of farmers of agro rich states of the country. The problems of marginal and small-scale farmers of the eastern region can be addressed through the state initiatives supporting contract farming. Diversification of agriculture in eastern zone was towards non-cereal products and to some extent towards livestock. Presently, demand for protein-based products like meat, egg, milk, and fish as well as fruits and vegetables has increased substantially with rise in income, assisted by demographic dividend and policy initiatives. This has offered huge opportunity to the unexplored fertile agricultural area of eastern zone to sustain diversified agricultural activities. The need of the hour is the young farmers' mind set towards application of modern agro facilities like contract farming, trading in futures and other facilities from finance and insurance through collaborative efforts.

Discussing various dimensions of crop diversification in India, G. D. Banerjee and S. Banerjee ('Crop Diversification: An Exploratory Analysis') argue that crop diversification (horizontal and vertical) is one of the best options to increase farm income leading to food, nutrition and ecological security as well as poverty alleviation. Therefore, greater attention should be paid to crop diversification by the government. Several steps can be taken to reduce risks and improve marketing facilities through improved roads and communications, construction of wholesale markets,



etc. Access by farmers, private traders, and exporters to credit also needs to be improved. Efforts should be made to identify high specialty crops, new crops, off-season varieties, and production systems to open up new opportunities for farmers. The promotion of multipurpose species would also be useful for diversification of agro-processing on small-scale at local and national level for productivity enhancement and expanded employment opportunities. Again, there is a need for improved seed and other planting materials for effective crop diversification. One major concern is the high post-harvest losses of crop produce, particularly in horticultural crops. The government should take initiatives to minimize such losses. The private sector can play a major role in the development of modern agro-enterprises to infuse capital and technology into diversified cropping systems for effective commercialisation for long-term sustainability. Since crop diversification is an important element of poverty alleviation, income generation, equity, and natural resource conservation, a well-designed mechanism has to be developed through the participation of the local governments. There is also a need for development of an information database on crop diversification for policy makers, farmers, consumers, and other stakeholders.

Based on secondary data, the study on 'Trend and Pattern of Crop Diversification in Odisha' by R.K. Panda examines the trend and pattern of crop diversification at the state and regional levels. In view of the predominance of small landholdings in the state, the study also examines the association of small holders in the cultivation of high-value crops (HVCs). It also outlines the recent policy initiatives taken up by the state government towards crop diversification. The findings of the study reveal a negative growth rate in the area under the cultivation of paddy, fibres, and tobacco, and a positive growth rate in acreage under pulses, oilseeds, spices, vegetables, sugarcane, and fruits at the state level from 2001/2002 to 2009/2010. Particularly, the trend growth rate in area under sugarcane and pulses was quite impressive during the period. At the regional level, the agro-climatically better-off region (coastal plain) does not show better performance in adaptation to commercial and high-value crops. The growth in acreages under oilseeds, fibres, fruits, vegetables, and sugarcane in this region lags behind other regions. The concentration of small holders is found to be higher in coastal plain as compared to other regions. The participation of small holders with varying degree across regions in crop diversification particularly with regard to fruits and vegetables is noteworthy. The recent policy initiatives taken by state government in raising crop diversity in the state is also noteworthy. However, these policies need to be implemented effectively by improving rural infrastructures and raising institutional support to small farmers who are found playing positive role in diversification process. H. N. Atibudhi ('Pattern of Agricultural Diversification in Odisha') analyses the trends and patterns of agricultural diversification in Odisha. He observes that there has been a significant change in the cropping pattern in the past few decades in the country as a whole as well in Odisha. The share of cereals in gross cropped area (GCA) was highest amongst other crops from 1970/1971 to 2007/2008. Moreover, the area devoted to food grains (cereals and pulses) was much higher in both the state and all India levels. However, diversification away from food grains was more prominent in Odisha in comparison to all India. In the state, diversification was found to be most



remarkable towards pulses and oilseeds, though after 2000, the area under oilseeds has declined. There have been remarkable changes in the relative shares of various crops (with significant contribution of fruits and vegetables) in the gross value of crop output from agriculture in the past few decades. The uncertainty in the crop production sector has warranted special policy interventions for strengthening the ailing livestock sector, which can provide supplementary incomes to the farmers and can contribute to the gross state domestic product significantly.

In the chapter on 'A Study on the Extent of Crop Diversification in West Bengal', S. Maji et al. observe that the agricultural sector in West Bengal has been gradually undergoing diversification in favour of high-valued food crops like potato, oilseeds, fruits, and vegetables. However, the pace of diversification has not been as fast as needed for speeding up of growth in agriculture. They argue that the pattern of diversification in the state is due to expansion effect. Based on primary data collected from *Katarni* paddy growing cultivators from Bhagalpur and Banka districts of Bihar, the chapter on 'A Study of Diversification of *Katarni* to HYV Paddy in Bihar' by B.K. Jha and R.K. Sinha analyses the trend and causes of diversification within crop (from '*Katarni* Paddy' to HYV paddy) in Bihar. They observe that even though *Katarni* paddy is unique and marvelous for its taste and flavour, uncomparable with any other paddy in the world, it has been facing the threat of extinction. Since 1991/1992, the area under *Katarni* paddy has started declining significantly mainly due to the constraints/reasons like (1) unchecked excavation of sand from the river *Chandan*, leading to declining water retention capacity of the river and escalation in irrigation cost; (2) erosion of genetic purity of *Katarni* paddy; (3) higher productivity of other varieties of HYV paddy; (4) lower productivity of *Katarni* paddy and in proportion to that, lower prices paid to the actual growers; and (5) declining domestic and global demand owing to selling of adulterated *Katarni* paddy by local traders/middlemen. Based on their field level experience, they have suggested some suitable measures to increase area under this aromatic rice.

## 1.2 Part II

The nature and problems of agricultural diversification are discussed in eight chapters included in Part II of this volume. In the chapter on 'Role of Dairying in Diversification of Indian Agriculture', C.L. Dadhich argues that diversification of agriculture is imperative to ensure among others nutritional security and smooth flow of rural income stream. While value of agriculture output is highly volatile, value of livestock output in general and value of milk output in particular is steady and stable. Dairy sector is one of the main drivers of growth of Indian agriculture. The importance of this sector cannot be overemphasised in the context of diversification of agriculture. Demand-led white revolution made rapid strides in majority of Indian states but largely by-passed eastern region. While most of the states registered shift in the composition of livestock in favour of dairy stock, the eastern states did not witness perceptible shift in its composition. The study brings to the fore