Chapter I

Introduction

Agricultural diversification may be defined as a change in product choice and input use decisions based on market forces and the principle of profit maximization (Pingali and Rosegrant, 1995). This means that the diversifying agriculture would move to areas where production is most efficient. At the farm level, diversification will represent a change in the underlying characteristics of the farm system such that farm practices and products are more aligned with the social, environmental and economic contexts in the overall background of the constraints and opportunities that exist. Thus, for the working purpose, diversification can be taken to mean a movement of resources from low value crops and activities to high value crops and activities (livestock, fishery and poultry). In some regions of South Asia, a monoculture rice-rice system prevails. In these areas, agricultural diversification necessarily implies a movement out of the monoculture system to a system where other high value crops or activities are combined at the farm enterprise level. While diversification may or may not lead to specialization at the farm level, it entails establishing a dynamic and optimal mixture of farm production alternatives at the community or sectoral level. This leads to diversity of the enterprise with co-existence of multiple agricultural enterprises including crop, livestock, fisheries, farm forestry and horticulture.

In the above context, Vyas (1996) defined agricultural diversification as a shift from less profitable enterprises to more profitable enterprises which is based on the farmer’s response to price signals and their efforts to adjust to changes in market. He justified agricultural diversification on the grounds that it (i) leads to greater income generation along with stabilization of income over the seasons, (ii) helps to attain much fuller employment level by the farm households, and (iii) helps conservation and enhancement of natural resources.

A number of studies have shown that there is a severe problem of seasonal unemployment and underemployment in large parts of agriculture in underdeveloped countries. The intensive cultivation of cereals by itself is unable to make a dent on the employment situation. The labour intensity in an agriculture dominated by the field crops is low. It has been found that increase in employment ranges from 0.4 to 0.5 percent with 1 percent increase in agricultural output (Reddy, 1991). For ensuring fuller employment to the
existing and growing labour force in the country side, it is necessary to have more labour intensive as well as high value crops or enterprises. According to Von Braun (1995), apart from income generation, diversification would in most instances increase employment opportunities for the rural poor, the benefits of which would be substantial and be distributed across a broad spectrum of the economy. Joshi et al. (2002) demonstrated the potential for rural employment generation through diversification from cereals to more high value crops such as vegetables. In any case, it is clear from the existing literature that diversification can contribute to increased local and national employment because many of the alternatives are labour intensive (Dolan and Sorby, 2002; Athurkola and Sen, 1998; Benzinger, 1996).

One of the problems facing the agricultural economies of the underdeveloped countries, including India, is the dominance of marginal and small farmers. They constitute a significant entity in terms of numbers as well as in terms of the areas cultivated. These households constitute the bulk of the rural poor in India. Because of the small operational base, it will not be possible to improve the incomes of these households by merely raising the yield of the existing crops on their holdings. Due to small land base, poverty of large number of these rural households could be mitigated with the introduction of the high value crops or enterprises on these holdings. That agricultural diversification is the fundamental contributing factor to reduce poverty in the rural areas has been supported by several studies (see, for example, Barghouti et al., 2007; FAO, 2001).

However, small and marginal farmers, in spite of having the advantage of abundant family labour, face certain constraints in the way of diversification, imposed upon them by their limited land base. Some of the constraints faced by them are: (a) Market risks: High value crops are often perishable in nature, their markets are thin, fragmented, and distorted and there is high volatility in their prices. A small increase in the supply of high value crops in the local markets can lead to steep fall in their prices causing immense losses to the farmers. (b) Access to credit: The production and marketing of high value crops are capital intensive which inhibits the participation of small holders in agricultural diversification. A shift from cereal based system to high value agriculture requires capital to acquire assets, new technology and infrastructure. The small and marginal land holders’ access to institutional credit is generally weak. (c) Lack of information and knowledge: Traditionally, the small holders produce high value crops both for home consumption and the market. But
they lack knowledge about their prices, grades and food safety standards. These information are almost non-existent in the developing countries (Dorjee et al., 2007).

The emerging global economic environment also shapes the course of agricultural diversification. Agriculture in all parts of India is facing a crisis in the post-liberalization period (roughly since mid-1990s). The WTO guided policy of import liberalization brought about free market access to more than 850 agricultural products. Along with this, poor agricultural infrastructure, lack of credit flow, slackening in agricultural research and extension, gradual withdrawal of subsidies etc. have worsened the agricultural situation of the country. The cost of cultivation data indicates that agriculture has become less remunerative with the rate of surplus declining due to slower growth of output value and higher growth of cost of cultivation (Khasnabis, 2003). It is in this situation, some scholars argued in favour of high value agriculture through a process of agricultural diversification. It is also argued that globalization and liberalization has indeed thrown up opportunities to increase the number of agricultural commodities offered for sale in the market by those farmers who can produce fruits, vegetables, dairy and poultry products in addition to or substituting for basic staples like rice. It also needs mention that production of agricultural commodities such as fruits, vegetables and items like cut flower etc. are largely demand-driven. With rise of income, both poor and rich consumers are likely to shift their consumption in favour of non-cereals. In fact, this transformation in consumption baskets is taking place in both rural and urban areas although the speed of transformation has been higher in urban areas. Pingali (2004) explained this shift in consumption pattern by the urban people in terms of growing number of urban middle class, increased female participation in the workforce, and a higher disposable income to spend on processed food outside home.

1.1 The Perspective

The existing literature on the subject of agricultural diversification mainly revolves around the estimation of the extent of diversification in specific areas, and identification of various ‘push’ and ‘pull’ factors that promote diversification. At any given point of time, diversification relates to the extent of diversity in crop cultivation or the maintenance of a diverse spread of crops in the cultivated area. Most scholars assessed the extent of diversification by using one or more of six measures, which are: (i) number of crops or
activities, (ii) Simpson’s index of diversity (SID), (iii) Herfindahl index of concentration (HI), (iv) Ogive index, (v) Entropy index, and (vi) Composite entropy index. All these indices are constructed using data on proportionate area under different crops cultivated in a particular area or the proportionate value of agricultural activities in the total value of output. Joshi et al. (2003) used the Simpson’s index to compare the extent of agricultural diversification in different sub-sectors in several South Asian countries and also in different parts of India. The Simpson’s index gives a clear picture of area dispersion under different crops. However, the critics observed that this index gives little weight to the rare activities and more weight to the common activities. Thus, Sharma (2005) used the Herfindahl index instead. However, both the measures suffer from the common limitation that they fail to capture the dynamic aspect of diversification or change in production choices or enterprise mix over time.

Almost all recent studies confirm that agricultural diversification is indeed taking place, though at varying degrees, in different regions of South and South East Asia. It is further observed that both the demand and supply side factors play important role in causing differences in the degree and pattern of diversification across the regions. There is now a broad consensus that agricultural diversification is triggered off by diversification in the food demand pattern, rapid technological change in agricultural production and improved rural infrastructure (Rosegrant and Hazel, 2000). In this context, Barghouti et al. (2007) argued that public sector has a positive role to play in promoting the process of agricultural diversification in the developing countries. Given the public good nature of knowledge and information about the agricultural markets and technologies in the developing countries, which are typically characterized by market imperfections and underdeveloped asset and insurance markets, the public sector has to play a vital role in these countries to support and encourage agricultural diversification, especially by small and marginal farmers. Poor and falling investment in rural infrastructure by the private sector in the developing countries is another justification for public policy intervention in the areas of investment in rural infrastructure like building of irrigation projects and road networks. The available empirical literature highlights the importance of demand side factors like per capita income and urbanization in raising the pace of diversification. Among other important factors, access to irrigation has been found to exert a strong influence on agricultural diversification, sometimes in a positive way (Chand and Chauhan, 2002; Sharma, 2005) and sometimes in a negative way (Joshi et al., 2007; Jha et al, 2009). Quite a large number of empirical studies
observed a positive relationship to exist between the proportion of small and marginal farmers and the level of agricultural diversification, which itself is an evidence of pro-small holder bias of agricultural diversification in the developing countries. However, there is also a caveat that the small and the marginal farmers will undertake diversification towards the high value non-food-grain crops only when the constraints they face towards diversification are removed.

1.2 Objectives of the Study

Crop diversification is of paramount importance in a developing economy like India in general and the state of West Bengal in particular. Change in the crop-mix over time within the crop growing sector is one of the basic characteristics of a progressive agricultural economy. Diversification within the ‘crop sector’ has been taking place in India in terms of a shift in area broadly from food-grain crops to non-food grain crops, especially after the mid-sixties (Pandey and Sharma, 1996; Vyas, 1996). During the decade of 1980s, non-food grain crops like potatoes, oilseeds and sugarcane have experienced quite high rate of growth in their areas (Chand et al., 2008). With India achieving self-sufficiency in food grains production by late 1970s, there was a turnaround in policy towards diversification as a result of which the area under cereal crops started declining after 1983-84. From early 1990s, diversification towards horticulture received a real boost.

The state of West Bengal occupies an important position in the agricultural scenario of India. Since 1970, it has been contributing a substantial proportion to total rice and food-grains production of India. The economy of the state continued to be predominantly agricultural. Though the share of agriculture in the state domestic product is declining over the years, agriculture still forms the backbone of West Bengal economy. A large proportion of the population in this state depends on agriculture for income, employment and food security. However, the agricultural situation of the state has undergone significant changes during the past few decades. The annual growth rate of agricultural output reached a high of 6.1 percent per annum after the mid-1980s. Although the state enjoyed high growth of agricultural production during 1980s, the rate of growth started declining since early 1990s, which raised the issue of sustainability of high agricultural growth in West Bengal. One possible explanation for this deceleration in agricultural growth rate has been that the
resources have already been optimally exploited with the help of existing state of technology thereby leaving not much scope for future expansion (De, 2003).

Another striking feature of agriculture sector in West Bengal is the progressive marginalization of its peasantry. The land reforms programmes implemented vigorously since early 1980s have created a large number of small and marginal farmers. According to the Agricultural Census Report of West Bengal for 2005-06, these farmers account for 95.6 percent of the total operational holdings of the state and operate 79.6 percent of the farm area. The average size of holdings has shrunken from 0.94 hectares in 1980-81 to 0.79 hectares in 2005-06. Thus, turning agriculture remunerative for this overwhelming number of small and marginal farmers becomes a major policy challenge for the state because the linkage of agriculture with the rest of the economy depends crucially on the welfare of the small and marginal farmers. The small and the marginal farmers of the state started taking initiatives towards agricultural diversification because cultivation of mono crop on extremely small plots of land is otherwise unviable. So, to get the wherewithal of cultivation and to meet their growing cash needs, the small and the marginal farmers in West Bengal started cultivating more remunerative non-food-grain crops wherever they got a facilitating condition. They concentrated on a mix of food-grain and non-food grain crops because their basic instinct is to maintain household food security and overcome the risk of cultivating by adopting a diversified crop portfolio. Recognising the importance of crop diversification, the state government has also recently taken policy initiatives towards encouraging diversification towards more remunerative non-food-grain crops in order to revitalize the agriculture sector. As a consequence, the cropping pattern started changing and the traditional varieties of crops are being replaced by new high yielding varieties and relatively more remunerative crops (Ibid.). The West Bengal Human Development Report (2004) also reports the increasing trend towards crop diversification in the state since 1985. It must be mentioned here that, following the all-India trend, diversification in favour of horticultural crops is also taking place in West Bengal since early 1990’s. During 1990-91 to 2005-06, fruits and vegetables were grown in around 13 percent of cultivated areas in West Bengal, which is next only to Orissa which has a share of 15.37 percent of the same. Both in Orissa and West Bengal, the share of fruits and vegetables in the total value of agricultural output were around 46 percent during the same period (Chand et al., 2008).

As against the above backdrop, our study uses secondary data to discuss the progress of crop diversification in West Bengal and its effect on agricultural growth of the state
during the period of 1980-81 to 2009-10. The demand and supply side factors which might have caused inter-district variations in the extent of agricultural diversification are also examined. We have further analysed primary data collected from the farm households in four villages of Nadia and Murshidabad districts of West Bengal to understand the factors that cause inter-household variation in the degree of crop diversification. Using primary data also helped us to have an idea about the implication of agricultural diversification for generation of employment and income for the cultivating households as also to determine their poverty status.

The specific objectives of our study are:
(1) To examine the extent and pattern of agricultural diversification in West Bengal;
(2) To measure the impact of crop diversification on the agricultural growth of the state;
(3) To examine the differences among the districts of West Bengal in terms of degree of agricultural diversification and identifying some factors that explain such differences;
(4) To examine the patterns of crop diversification by different categories of farmers in West Bengal;
(5) To identify the factors those explain inter-farm differences in the degree of diversification in West Bengal;
(6) To understand the effect of crop diversification on the employment and earnings levels of the farming households in West Bengal. In this context, we also look into the impact of crop diversification on the poverty status of the farming households.

1.3 Plan of the Study

The present study runs through seven chapters. The first chapter briefly introduces the nature of the study and its objectives. In this introductory chapter, we have briefly explained the importance of agricultural diversification as an alternative ‘rural strategy’ for improving the decelerating growth rate of an agricultural sector which is largely based on mono-cropping, cereal-dependent, cultivation practices. We have framed a working definition of agricultural diversification in the context of a developing country like India. Finally, the chapter outlined the specific objectives and plan of our study and the rationale of such a study in the context of rural West Bengal.

Chapter II presents a brief review of the existing literature covering the major issues relating to agricultural diversification. It chronicles the different perspectives for examining
agricultural diversification commonly used in the existing literature and their developmental role. Special focus has been put on the cost and benefit of agricultural diversification by the small and marginal farmers who are an overwhelming majority in the developing countries. It also exposes the issues relating to the measurement of agricultural diversification and gives a brief account of the measurement formulae that have been used in different studies. More importantly, it sketches the influence of the various demand and supply side factors related to technological, infrastructural and institutional set up of a region, that could facilitate agricultural diversification, or alternatively could retard the pace of agricultural diversification in that region. Evidences from Indian experiences with agricultural diversification at the macro and micro level have been summarized in this chapter.

Chapter III presents the data base and provides an idea about the field survey methodology and area chosen for our field investigations. The chapter also presents some basic information about our survey areas.

Chapter IV provides an aggregative view of the on-going process of agricultural diversification in West Bengal and its impact on the agricultural growth of the state. Some factors such as spread of irrigation and preponderance of small and marginal farmers that facilitated agricultural diversification at the aggregate level has been emphasised here. The chapter also discusses the issue of inter-district variation in the extent of agricultural diversification and explains the same in terms of some supply side factors (e.g., irrigation, more specifically minor irrigation, consumption of fertilizers, yield of food-grains, incidence of small and marginal farmers and road length) and demand side factors (per capita income and urbanization).

Chapter V focuses on the issue of crop diversification by the farming households in rural West Bengal. We examine here the extent, pattern and determinants of crop diversification among different size groups of farming households by using data collected through field surveys from two different districts of the state, one advanced and one backward. This chapter specifically considers issues such as the extent of diversification from the perspective of area allocation and value generation among the different size groups of farmers and the variation in the pattern of crop mix adopted by different categories of farming households in different regions. This chapter also addresses the pertinent issues of (i) whether the extent of agricultural diversification varies inversely with the farm size and(ii) what are the determinants of the extent of crop diversification at the farm household level.
Chapter VI examines the impact of agricultural diversification on the employment and income/earnings levels of the farmers in our study regions. We also explore some possible determinants of the level of farm incomes for the farming households in our study areas. Finally, we examine the effect of diversification on the poverty status of the farming households. The final chapter VII provides the summary of the main findings emerging from our study. This chapter also suggests some policies to promote crop diversification in the state in future.