

A REVIEW OF AGRICULTURAL DIVERSIFICATION IN CONTEXT OF INDIA AND ASSAM

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Abstract

Traditionally, agricultural diversification referred to a subsistence kind of farming wherein farmers were cultivating varieties of crops on a piece of land and undertaking several enterprises on their farm portfolio. Household food and income security were the basic objectives of agricultural diversification. In the recent decades, agricultural diversification is increasingly being considered as a panacea for many ills in the agricultural development of the country. Diversification at the farm level is supposed to increase the farm income; the utility of diversification as risk management practices however, remains. At the country level, diversification is supposed to increase the extent of self-sufficiency for the country. At the regional level, diversification is being promoted to mitigate negative externalities associated with mono-cropping. This study tries to focus on some relevant issues of agricultural diversification and elaborate it by reviewing different articles related with agricultural diversification. This study will certainly help in future research on agricultural diversification in some specific issues.

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Introduction

Traditionally, agricultural diversification referred to a subsistence kind of farming wherein farmers were cultivating varieties of crops on a piece of land and undertaking several enterprises on their farm portfolio. Household food and income security were the basic objectives of agricultural diversification. In the recent decades, agricultural diversification is increasingly being considered as a panacea for many ills in the agricultural development of the country. Diversification at the farm level is supposed to increase the farm income; the utility of diversification as risk management practices however, remains. At the country level, diversification is supposed to increase the extent of self-sufficiency for the country. At the regional level, diversification is being promoted to mitigate negative externalities associated with mono-cropping

The concept of diversification at the macro level is move away from agriculture to secondary and tertiary sectors because of changes in consumer expenditure due to sustained economic growth and rise in per capita incomes. At the farm or micro level in the traditional subsistence agricultural system diversification is a coping mechanism for risk aversion, to act as an insurance against adverse climatic conditions and biotic and abiotic stresses.

Objective and Methodology

The objective of this paper is to identify some issues related to agricultural diversification in India as well as Assam. The paper is descriptive in nature and the required informations are collected from different research works related to agricultural diversification. In otherwords this is a reviewed work on agricultural diversification.

Theoretical and Conceptual Framework

Diversification of Agriculture is a process that has several dimensions. It can be viewed, narrowly, as a larger mix of activities within agriculture involving crop substitution. Diversification can also involve "a shift of resources from one crop (or livestock) to a larger mix of crops and livestock, keeping in view the varying nature of risks and expected returns from each crop/livestock activity, and adjusting in such a way that it leads to optimum portfolio of income" (Joshi , et al, 2003) . Diversification of Agriculture may also be viewed as "the

diversion of resources previously committed to farming to other income-earning activity" (cited in Turner, 2004). This would mean a shift from farm to non-farm activities. For countries such as India, diversification of agriculture represents a shift from low value commodity mix to a high value commodity mix with increasing specialization. Diversification of Agriculture, in its broadest sense, is "a dynamic optimal mixture of farm production alternatives capitalizing on between-farm heterogeneity in terms' of resource availability and qualities." (Barghouti, et al., 2004). In the present economic context, diversification of agriculture is demand-driven and the farmer's choice of crop is at the centre of diversification of agriculture dynamics. The process of agricultural diversification is , therefore, summarized as "a change in product (enterprise) choice and input use decisions based on market forces and the principles of profit maximization." (Pingali and Rosengrant, 1995). A broader point of view suggests that diversification of agriculture is a process accompanying economic growth, characterized by a gradual movement out of subsistence food crops (mostly rice in Southeast Asia) to a diversified market-oriented production system, triggered by improved rural infrastructure, rapid technological change in agricultural production, particularly food staple production, and diversification of agriculture in food demand pattern (Rosegrant and Hazel , 1999) .

Given the wide-ranging impact of agricultural diversification strategies in terms of linkages with other sectors and potential for speeding up rural industrialization, a distinction can be made between horizontal and vertical diversification of agriculture. Briefly stated, horizontal diversification of agriculture refers to the production of different crops/a new crop mix whereas vertical diversification of agriculture refers to value added activities such as agro-processing. Diversification of agriculture can occur at the micro, regional, and macro level (Taylor 1994). At the micro level, the individual household diversifies in order to broaden its sources of farm and non-farm income. At the regional level, regions pursue agricultural activities in which they have comparative advantage. For both households and regions, diversification of agriculture may involve specialization, as for example rain fed rice farmers becoming specialized tobacco growers or coffee producers. At the macro level, diversification of agriculture implies the structural change from agriculture into non-farm activities, either in rural or urban areas, or in rural towns (Otsuka 1998).

Diversification of agriculture can be viewed as a flexible form of development that induces "sustainable growth by encouraging sustainable production systems in line with the available resources of farmers and microenvironments of soil and land, capturing on the seasonal and regional availability of resources, and improving the nutritional balance of consumers. It promotes synergies from complementary coexistence of multiple agricultural enterprises, including crop, livestock, fisheries, farm forestry, and horticulture." While these changes, in turn, induce a need to reexamine the role of diversification of agriculture, diversification of agriculture inevitably remains "an integral part of the process of structural change in the global agriculture systems." (Barghouti, et al, 2004).

Generally it is observed that there is a positive relationship between price level and agricultural diversification. This view implies that if farmers are offered higher prices for their crops, they will, in order to benefit from the new opportunities, increase the production of these crops. If on the other hand, the prices offered decline, the farmers will reduce the production of that crops. One of the most serious protagonists of this view is T.W Schultz. He has in his epoch making book "Transforming Traditional Agriculture" emphasized that the farmers in traditional agriculture, though poor, are efficient. By efficient he implied that the farmers allocated their resources so efficiently that marginal costs and marginal returns, for various inputs used in producing various crops were equal to each other. Such an efficient allocation of resources would not have been possible if the farmers had not responded normally to price changes i.e. producing more of those crops whose prices had gone up and less of those crops which prices had gone down.

Agricultural Diversification as a Risk Minimizing Strategy

Instability of agriculture is mainly a problem of the developing economies. Instability of agriculture implies fluctuations in prices, income and output obtaining in the agricultural sector. Instability of agriculture is mainly of two types (i) instability in prices and (ii) instability in income. Change (rise or fall) in agricultural prices may also result in a change (rise or fall) in income of the farmer or in other words, one may say that price instability may also result in income instability. For example, if the demand for agricultural products, in general rises (or falls), but the supply conditions remain unchanged, prices will rise (or falls) and the total

income will also rise (fall). So, fluctuations in price and income create risk and uncertainty in agriculture. To overcome such instability diversification in agriculture can play greater role. Proper and well thought out diversification will definitely reduce instability of income because failure of one crop after diversification will affect only a part of the total income. Different studies have provided considerable amount of evidence that people are generally risk averse. Agricultural diversification ensures stability in the farm incomes by minimizing risk because the low return from one crop is compensated by the high return from others (Heady, 1968). In the study of T. Haque in 1996 on agricultural diversification mentioned that diversified farm generally have higher growth and stability of farm income, as the risks due to fluctuating production and market prices would be minimum, as all crops/enterprise on the same farm would not face adverse weather condition, pest/insect attack or price uncertainties the same season or year. Diversification is high as a risk mitigating strategy against production risk due to harsh and unpredictable agro-climatic conditions (Joshi 2004). In the same way, Shiyani and Pandya 1998 in their study point out that a diversified cropping pattern is suggested as an important strategy to cope with agriculture due to climatic and biological vagaries, Mandal Raju(2010), in a study in Assam point out that crop diversification in Assam can play a major role as risk minimizing strategy.

It is well known that there is a close and positive relationship between income elasticity and price level. If farmers are offered higher prices for their crops, they will in order to benefit from the new opportunities, increase the production of these crops. If on the other hand, the prices offered decline, the farmers will reduce the production of the crops. High income elasticity for fruits and vegetables led to higher price and higher price has led to an increase in the area under fruits and vegetables (Jha, Kumar, Mohanty 2009)⁶. Most high value food commodities are labor-intensive, have low gestation periods and generate quick returns. Hence, they offer a perfect opportunity for smallholders to utilize surplus labor and augment their incomes (Joshi et al. 2002; Barghouti et al. 2005; Weinberger and Lumpkin, 2005). studies in South and Southeast Asia have indicated that diversification towards high-value food commodities supports the development of innovative supply chains and opens new vistas for augmenting income, generating employment and promoting exports (Barghouti et al. 2004; Pingali 2004; Deshingkar et al. 2003; Pokharel 2003; Wickramasinghe et al. 2003; Goletti 1999). Moreover, food and income security have been shown to increase in regions where agricultural

diversification takes place, particularly favoring horticulture, animal husbandry, and aquaculture (Barghouti et al. 2005; Dorjee et al. 2002).

Changing Consumer Demands and Agricultural Diversification

As a consequence of urbanization, international migration, how the new definition of food security is emphasizing the balanced diet, increasing reach and effectiveness of global media and marketing systems, and increasingly adventurous consumption habits, the structure of consumers demand for food is changing. Income is one of the notable factors that lead to agricultural diversification. Higher economic growth and consequent rise in incomes, coupled with change in tastes and preferences in both urban and rural areas are translating into higher demand for high-value commodities. It is generally observed that high value commodities particularly, horticulture, livestock and marine products are highly expenditure elastic compared with grains (Kumar et al. 2007). In all South Asian countries the income elasticity of demand for fruits, vegetables, milk and meat is high compared to staples like cereals, pulses etc (Paroda and Kumar 2000). Given rising incomes and higher expenditure elasticity for these commodities, future growth is likely to come from the high value sector (Gulati & Ganguly 2008). Due to growing concerns with dietary health, the market for nontraditional fruits and vegetables has expanded rapidly over recent years, which will contribute to the improvement of the nutritionally balanced diet. These shifts in consumption patterns occur not only in industrialized countries but also in both urban and rural areas of developing countries. Structural changes in demand—associated with a wider choice of foods available, exposure to a variety of dietary patterns of foreign cultures, a premium for foods requiring some preparation, more sedentary occupations, and separation of food consumption from production—are also related to increasing demand for nonfood agricultural products (for example, cut flowers, plant- and animal-derived textiles, and new sources of natural energy such as ethanol). Thus changing consumption pattern creates opportunities for the vertical value added diversification of agricultural commodities (Barghouti, Kane, Sorby, Ali, 2004). Another study also observed that changing life styles and income brackets, India, like other Asian countries, is experiencing “ Westernisation of diets”, where the share of fresh and processed high value food is on the rise and as a result it motivates agriculture towards high value food (Pingali, 2006). Sustained economic growth (nearly 8 percent per annum in recent years), rising per capita income, growing urbanization, and

unfolding globalization are causing a shift in the consumption patterns in India (Kumar et al 2003). Such changes in consumption patterns clearly reveal that food security is no longer restricted to availability of cereals but involves a diversified food basket that includes high value commodities such as fruits, vegetables, milk, meat, eggs, fish and processed commodities (Rao, Hanumantha 2000). So, shift in consumption Patterns in favor of high-value food commodities depict an on-going process of agricultural diversification.

Contract Farming and Agricultural Diversification

Contract farming refers to the production and supply of agricultural produce under advance contracts, the essence of such contracts being a commitment to provide an agricultural commodity of a type, at a time and a price and in the quality required by a known buyer. In the study of Sukhpal Singh in 2004 Establishing farm-firm linkages (contract farming) is not only about providing assured markets, reducing risk, and ensuring 'remunerative' prices, but also providing critical services such as credit, insurance, grading and inspection, technology extension, and market information. These institutional services can help elevate the scale at which small holders can operate, raise their productivity and income, and mitigate the risks involved in participating in markets for high value horticultural, livestock, and fishery products (Gulati, Joshi, Landes 2008). Contract farming offers a number of benefits to farmers, such as higher returns, lower marketing and production costs, assured markets and shared risk in production (Birthal et al. 2005). Massive investment made by corporate giants like Reliance, Spencers, Subhiksha and many other regional players have opened up new markets for fresh and processed high value commodities and it leads to change the cropping pattern from traditional commodities to high value commodities (Rao, Joshi, Kumar and Ganguly, 2008). The farm sector in Punjab is plagued with declining farm incomes, monoculture of wheat and paddy, decline of ground water table, ecological degradation and over capitalization. But agriculture is the primary engine of growth without which Punjab will neither be able to accelerate growth nor achieve fiscal sustainability. Therefore diversification within agriculture is intended to stabilize incomes and employment in the farming sector. Contract farming is being promoted to achieve this diversification by promoting high value crops, lowering cost of production with better extension and raising returns by assured market and higher prices for the produce (Singh 2004). Contract farming has also been used in many situations as a policy step by the state to bring about

crop diversification for improving farm incomes and employment (Benziger 1996, Singh, 2000). From the different studies it can be said that contract farming can enhance agricultural diversification through assured markets, reducing risk and ensuring remunerative prices.

Urbanisation and Agricultural Diversification

Urbanisation is one of the key issues regarding agricultural diversification. India achieved self-sufficiency in food grain production in the mid-1990s, thereby mitigating the prevalent food security concerns. Food grain production increased from 176 million tons in 1990/91 to 213 million tons in 2003/04. During this period, the Indian economy also witnessed consistently robust growth of about 6% a year. The urban population grew faster than the rural population between 1991 and 2001, when the compound annual growth in the urban population was 2.8% compared to 1.7% in the rural population. These factors could be seen as collectively propelling rapid changes in the food baskets of Indian consumers (Ravi and Roy 2006). Higher economic growth and consequent income growth in both rural and urban areas are translating into higher demand for high value commodities like fruits, vegetables and live stock products like milk, meat fish (Dorjee et al 2002; Pokharel 2003; Wickramasinghe 2003; Joshi et al 2004). Growing urbanization and rising incomes levels are responsible for a different agriculture, which is very distinguished from the traditional agriculture. Such a transformation is leading to change in production portfolio from cereal-based system to high-value commodities, such as vegetables, fruits, poultry, milk, mushrooms, fish, etc (Rao, Birthal, Joshi and Kar, 2004). In the same way Kumar and Mathur (1996) have found that structural shift (Urbanisation) had a positive impact on demand for vegetables, fruits, meat, fish and eggs. Thus due to urbanization the consumption pattern of people changes towards high value commodities and it leads to diversify the agricultural sector.

Agricultural Diversification in India

In view of the various problems and challenges faced by the existing production pattern, unemployment among youths, increasing proportion of land holdings of uneconomic size, increasing production and price variability in agricultural sector and arising trade opportunities and demand pattern, extensive research is needed to explore the potential and prospects of agricultural diversification in India.

Agricultural diversification in India is steadily accelerating towards high value crops and livestock activities to augment farm income. Some of the factors that influence the nature and pace of agricultural diversification from staple food to high value crops are technological change in crop production, improved rural infrastructure and diversification in food demand. The nature of agricultural diversification differs across regions due to wide heterogeneity in agro-climatic and socio-economic conditions. Generally the pattern of agricultural diversification shows a shift from crop production to livestock production during the 1980s to 1990s. During the 1960s the Indian economy was confronting the problem of food insecurity. Both market (infrastructure) and technology were less developed, which were mainly responsible for low output and higher variability in the returns of both the food and nonfood crops. The introduction of Green Revolution was a step towards changing the orientation of farmers, in terms of adoption of new and better technology. These steps proved to be significant, not only in increasing food production in India but also in increasing the growth of output, especially during 1970s and 1980s. However, the success did not sustain longer and from mid 1990 onwards, the country started facing low growth along with near stagnation in food production (Chand 2005). The module of development in the previous decades concentrated on a few food crops and, accordingly, several states showed patterns towards increased specialization in a few crops. Such development Initiative or Policy came under pressure, especially after the introduction of World Trade Organization (WTO) in 1995, that demanded reduction in support measures and subsidies. At the same time, a sustained economic growth, rising per capita income and growing urbanization caused a shift in the consumption patterns in favour of high-value crops that also substantiated the role of diversification as a policy tool for development in the agriculture sector (Vyas, 1996; Kumar and Mruthyunjaya, 2002 and Joshi 2005)

Agricultural Diversification in Assam

Agriculture in Assam exhibits most of the characteristics of underdeveloped/backward agriculture, namely, a high dependence on agriculture for livelihood, widespread practice of traditional farming techniques and correspondingly low usage of modern farm inputs, low levels and low growth in productivity and incomes in the sector, widespread prevalence of subsistence cultivation, poor / inadequate agricultural infrastructure, and so on. Assam is one of the important states of the Indian Union where agriculture is the mainstay of the

state economy. Agriculture is the main source of income for over 80 per cent of the rural population of the state. The agricultural sector contributes about 28.17 percent of the state domestic product in 2004-05. The average operational holding in the state is 1.31 ha and over 60 per cent of the total operational holdings in the state are marginal i.e., less than 1 ha and 23 per cent of the holdings are small i.e., 1 to 2 ha, 14 per cent holdings between 2 to 3 ha are medium and only 3 per cent holdings are large i.e., above 3 ha. Thus over 83 per cent holdings in the state are marginal and small. The viability and sustainability of the weaker section of the society especially the small and marginal farmers largely depend on the success of agriculture. Unfortunately the subsistence nature of agriculture, inadequate investment in agriculture and lack of interest in farming often results in poor return from farming. Therefore, to enhance the agricultural sector agricultural diversification is very much important.

Different studies on agricultural diversification in Assam have been going on. In the study of Talukdar in 2007, he mentioned that several districts of Assam are in the flood prone zones affecting two lakh hectares annually and the farmers are to sustain their livelihood adjusting their cropping pattern before and after flood. Cropping pattern in the state is predominated by cereals whose proportionate area is declining in the recent years and the state has witnessed a moderate growth of diversification. The development activities allied to agriculture would tremendously contribute to the diversification of agriculture in North East India (passah, 2008). The recurring floods in Assam cause instability in agricultural production. To avoid crop losses due to frequent floods many farmers have adopted a risk-averse strategy by an appropriate combination of crops. This has led to a decline in the acreage share of kharif food grains and a corresponding increase in rabi food grains and vegetables (Mandal, 2010). An appropriate combination of crops may be instrumental in minimizing the damage to crop-growing sector caused by the vagaries of flood. A study by Purkayastha (2005) has shown how in the Nagaon district of Assam, the farmers largely settled in geographically disadvantaged areas are trying hard to cope with the recurrent and prolonged floods by experimenting with different crop combinations in low-lying fields and have been successful with this strategy. According to Goyari (2005), to avoid crop losses due to frequent floods, many farmers in the state have adopted a risk-averse strategy as a result of which there has been a decline in the acreage of kharif food grains and an increase in the acreage share of rabi food grains and vegetables.

Conclusion

From the above discussion it is observed that there are different factors which lead to agricultural diversification. Firstly, it is observed that there is a close relationship in between agricultural diversification and agricultural risk. To overcome production risk in agriculture due to natural calamities farmers generally prefer to diversify their agriculture from traditional crops to high yielding crops or food grains to non food grains or concentrates on livestock, piggery, dairy etc. Another type of risk is price risk. Price risk is mainly influenced by inadequate market facilities and lack of proper market infrastructure. So, to overcome price risk farmers generally prefer to cultivate those crops which have price stability. In the same way, there is also a positive relationship in between agricultural diversification and pattern of consumers demand. Change in tastes and preferences in both urban and rural areas are translating into higher demand for high-value commodities. As the demand pattern changes towards high value commodities farmers prefer to diversify their cultivation towards high value commodities to have a good income. There is also a close relationship between agricultural diversification and contract farming. Due to globalization or liberalization different agro- processed industries and MNCs operate their business in the form of contract farming in different parts of India. Contract farming is not only about providing assured markets, reducing risk, and ensuring 'remunerative' prices, but also providing critical services such as credit, insurance, grading and inspection, technology extension, and market information. Therefore, the farmers diversify their agriculture towards high value crops such as tomatoes, mangoes, and oranges etc. which are the raw materials of such industries or corporations. Urbanisation is one of the key factor which leads to agricultural diversification. Growing urbanization and rising incomes levels are responsible for a different agriculture. As urbanization grows the demand pattern of the people changes towards high value commodity such as vegetables, fruits, meat, fish and eggs etc. And this changing trend of demand pattern of the urban people leads to diversify the agriculture sector. Thus there is also a close relationship between agricultural diversification and urbanization. Thus, while examining diversification of agriculture one should have close look the determining factors in a particular area.

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