Why is Agricultural Diversification? - A Theoretical Framework

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Abstract

Agricultural diversification is a process through which farmers shift their farm enterprises from traditional to high value added modern enterprises. It enhances farm income, generates employment opportunities and manages risk in agriculture. Most of the studies in the literature of agricultural economics have found that agricultural diversification is the key strategy to reduce risk in some naturally disturbed regions like flood prone areas, drought affected areas etc. By keeping in view the importance of agricultural diversification, this paper tries to examine the implications of agricultural diversification in different segments of agriculture by accessing different literatures in connection to agricultural diversification. The study found that agricultural diversification stabilizes or safeguards farm income or production during the vagaries of natural calamities or market imperfections.

Key words : *Agricultural diversification, Risk, Market imperfection.*

1. Introduction :

In the recent decades agricultural diversification is one of the most prolific issues of discussion in agricultural economics. Agricultural diversification is a process in which farmers change their farm activities or crop pattern from low to high value commodities or farm enterprises.Diversification involves 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). A broader point of view suggests that diversification of agriculture is a process

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accompanying economic growth, characterized by a gradual movement out of subsistence food crops 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). Now, the fundamental question is that why should farmers go for agricultural diversification? Thus, this paper basically deals with this emerging question regarding the rationality of agricultural diversification in different circumstances.

2. Objective :

The main objective of this paper is to examine the rationality of agricultural diversification with the help relevant literature on agricultural diversification.

3. Methodology :

This paper is completely based on secondary information. To fulfill the objective of this paper different published and unpublished research articles, papers, books, government reports etc., on agricultural diversification have been consulted. After consultation of the literatures, different issues have been brought out and discussed according to its nature.

4. Risk and agricultural diversification :

Risk is an unambiguous phenomenon in agriculture. Farmers in different parts of the world have been experimented different recourse to neutralize risk in agriculture. One of the prominent strategies to mitigate risk in agriculture is agricultural diversification. Thus, this part of the paper examines the relationship between risk and agricultural diversification.

Risk and uncertainties play vital role in any kind of decision making process in agriculture. Every day farmers face with a significant amount of uncertainty. As a result agricultural producers are forced to make decisions based on imperfect information. Born out of this uncertainty is the possibility of injury or loss. Risk can be defined as the possibility of adverse outcomes due to uncertainty and imperfect knowledge in decision making (Sarah A. Drollette, 2009). Risk and uncertainty are ubiquitous and varied within agriculture and agricultural supply chains. This stems from a range of factors including the vagaries of weather, the unpredictable nature of

biological processes, the pronounced seasonality of production and market cycles, the geographical separation of production and end users, and the unique and uncertain political economy of food and agriculture sectors, both domestic and international (Jaffee, Siegel and Andrews, 2010).

Managing risks in agriculture is particularly challenging, as many risks are highly correlated, resulting in whole communities being affected at the same time. Clearly, given the widespread nature of resultant loss, financial recovery is particularly difficult and challenging. For governments, the fiscal implications of social safety net payments or the rebuilding of damaged infrastructure can be serious. For insurers, sudden losses suffered by a large number of policy holders places a strain on their reserves and financial stability. For farming communities, there is often no other option than to sell assets, normally at distressed prices (Barnett and Coble, 2008). Thus, the researchers found that maintaining risk in agriculture is a challenging task as it involves high risks and uncertainty. However, over the period different risk mitigating strategies have been developed and used to a large extent in agriculture.

Different researchers have found that agricultural diversification is one of the prominent strategies of risk mitigation in agriculture. The broad rationale for agricultural diversification emanates from the opportunities it offers to reduce production and price risks, increasing yields, natural resource sustainability, maintaining ecological balance, increasing flexibility and sustain productivity and growth. It also creates opportunities for more employment and higher incomes through more efficient use of resources and exploitation of comparative advantage (World Bank, 1990). On a whole, agricultural diversification is a process, which on one hand helps the grower to improve per capita income and diffuse risk, and on the other hand provides more diversified food items to the consumers. It minimizes the risk associated with production of single crop and helps the farmer to liberate from the poverty trap (Deshpande, et.al., 2007). A farmer will get incentives in agriculture when there is stability in the farm income. Instability in farm income increase risk in agriculture and makes agriculture unprofitable. In this context researchers found that 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 (1996) 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 (Joshiet. al., 2004). In Assam one of the major challenges for agriculture is frequent flood creating risk in the decision making process of farmers. In such condition agricultural diversification can play vital role to reduce risk and stabilize income of the farmers (Mandal, 2010).

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 and Mohanty, 2009). Most of the 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 (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 (Deshingkaret.al., 2003; Pokharel, 2003).

The above literatures on agricultural diversification establish the fact that agricultural diversification reduce risk that arise in agriculture. But the studies did not mention about the conditions when agricultural diversification reduce risk. Agricultural diversification always may not be a good strategy for reducing risk in agriculture and it depends on certain conditions like well-developed marketing channels, existence of agro-based industries, contract farming etc. In this context some agricultural economists like Corinne Valdivia, Elizabeth G. Dunn, and Christian Jetti (2012) had made one study on diversification and risk management in Columbia. In their study they have pointed out that the incentive for ex ante risk-reducing strategies, such as diversification, should be lowered when a household has effective mechanisms for dealing with losses ex post. In other words, there is less of a need to smooth income through diversification when there are alternative mechanisms for smoothing consumption after an income shock has occurred. Examples of ex post loss management mechanisms include liquidation of assets,' borrowing, labor sales, temporary migration, and nonmarket mechanisms. Thus from their findings it is clear that diversification always may not

be a risk mitigating strategy in the vagaries of natural calamities or in some circumstances. Furthermore, the cultivation of high value added commodities or opening a new farm enterprise is itself a risky business for the small and marginal farmers. Sometimes, cultivation of high value added commodities generates more risk in cultivation. Most of the farmers in India are found to be unskilled or illiterate in nature and they feel risky in the introduction of new crops in their cultivation. Very few studies have covered such issues relating to agricultural diversification and risk.

5. 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 western 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 made

by Pingali (2006) also observed that changing life styles and income brackets, India, like other Asian countries, is experiencing "Westernization 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 Sustained economic growth (nearly 8 percent per annum in recent years), rising per capita income, growing urbanization, andunfolding 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, 2000). So, shift in consumption Patterns in favor of high-value food commodities depict an on-going process of agricultural diversification. Now it can be summarized that to fulfill the demand of the people towards high value added commodities, concentration on agricultural diversification towards high value commodities like fruits, vegetables, meat, milk, egg etc., are become urgent need.

6. Urbanization, Rising Income and Agricultural Diversification :

Urbanization and level of income of the people play major role in determining agricultural diversification. Different studies relating to agricultural diversification have justified this fact. Kumar and Mathur (1996) found that the two demand-side variables, per capita income and urbanization showed a positive and significant influence on the growth of livestock activities. The rising per capita income and growing urbanization are raising the demand for livestock products in the consumption basket leading to diversification in the livestock sector. In the study of Bhattacharyya (2008) observed that the demand side factor, urbanization, has a strong effect on the degree of 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 percent 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 percent compared to 1.7 percent 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). Thus due to urbanization the consumption pattern of people changes towards high value commodities and it leads to diversification of the agricultural

sector. But in some cases it is not always true and in this context the researchers did not mention some conditions. In India though urbanization is growing at a faster rate in different states, but only few states have taken the opportunities of urbanization and have diversified their agriculture to maintain the growing demand of agriculture. Because these sate having more agricultural infrastructure than most of the urban growing states and can diversify their agriculture. Thus, it is established that there is a positive relationship between urbanization and agricultural diversification; but it depends on availability of agricultural infrastructure like irrigation, good road connectivity, marketing etc., in the urban growing states.

7. Food Security and Agricultural Diversification :

Economic literature suggests that agricultural diversification and particularly crop diversification is fundamental for development in agrarian based economies. It has been promoted in developing countries for its ability to enhance household incomes and ensure food and nutrition security. Following the successes of the Asian Green Revolution, crop diversification is strongly regarded as a vital element in raising incomes, improving food security outcomes and reducing poverty (Ibrahim et.al., 2009). At the household level crop diversification is a potential vital pathway for household food security and nutrition through incomes realized from the sale of agricultural produce (Haddad, 2000). Joshi et.al., (2003) find that a crop diversification portfolio that includes cultivation of high yielding and high value crops has the strongest impact on incomes at the household level. The poverty effects of crop diversification have also been documented by Mukherjee and Benson (2003) who find that households that cultivate a diverse range of crops (i.e. other than the traditional maize and tobacco) are less likely to be poor. Agricultural incomes have also been found to make a positive contribution to child nutrition particularly where households have access to improved health and education systems (Bhagowaliaet.al., 2012).

In India the consumption basket is changing over time. The food consumption is shifting from cereals to non-cereals in both rural and urban areas. The per capita cereal consumption in rural and urban areas has declined, while those of milk, milk products, vegetables and fruits have increased significantly (Kumaret.al. 2002). Most remarkable increment in consumption was witnessed in case of fruits. The available evidence clearly reveals that diversification of crop and livestock sectors has not only increased production of non- cereal commodities, but also raised their consumption

pattern. A more favorable environment for diversification towards high-value commodities will not only ease the pressure of storing huge surplus of rice and wheat but also accelerate growth of agricultural sector through high-value commodities (Gulatiet. al., 2008).

The literatures deliberate that for both household food security and nutrition security, crop diversification is necessary. However, in some circumstances crop diversification may not be a good strategy for household food security. It has been observed that most of the developing countries still rely on crop concentration to maintain their first level of food security. This is true that crop diversification enhance farm income and results both household food security and nutrition security. However, it needs to be remembered that cultivation of high value commodities are at the same time a costly and risky cultivation process for the small and marginal farmers. Therefore, without some institutional support, it will be difficult for the small and marginal farmers to diversify their agricultural activities in the developing countries. The cropping pattern of most of the developing countries is still dominated by cereals or food grains cultivation. So, crop concentration is their ultimate strategy to maintain the subsistence level of food security. According to Engles law as income increases people shift their consumption from food to non-food items. However, the per capita income in the poor countries is low and still their first priorities in the food baskets are staple food. Highly farm diversified countries in the world are developed because their preference towards high value commodities are more compared to the developing or underdeveloped countries. Therefore, the issue of food security and agricultural diversification needs to be investigated carefully.

8. Options for Assam :

Agriculture in Assam exhibits most of the characteristics of underdeveloped 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 thestate 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 percent 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. As suggested by different studies on agricultural diversification argue thatin such situation, diversification of agriculture may be one of the viable options for the revival of the agricultural sector in Assam.

Few studies on agricultural diversification in Assam have been found in the literatures. In the study of Talukdar (2007) 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 pre-dominated 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.However, Saikia S, 2016 has found that crop diversification in the flood affected areas of Assam may not be a complete solution to tackle risk in agriculture.

The author opined that nature of flood determines the choice of enterprises by the farmers. In his study he found that the farmers in the flood affected areas also concentrates on non-crop diversification. So, he concluded that both crop and non-crop diversification helps in mitigation of risk.

Thus, the studies experienced that to avoid the risk of flood most of the farmers in the flood affected areas shift their cultivation from rice to other remunerated crops. So, both agricultural and crop diversification may have significant impact in the agricultural sector in Assam. In addition to this the farmers need to improvise both crop and non-crop sector to deal with flood.

9. Conclusion :

The literatures on agricultural diversification establish the notion that diversification of the farm sector is indispensible to mitigate both production and price risk, to fulfill changing consumer demand, to maintain different levels of food security or nutrition security etc. It can be said that to enhance farm income or to provide indirect farm insurance due to enterprise failure in agriculture, agricultural diversification could be a meaningful option for the farmers. However, for the smooth functioning of agricultural diversification, proper structuring of agricultural infrastructures like irrigation, credit, marketing etc., organization of agricultural enterprises need to be engrossed. In addition to this, in the flood affected areas of Assam, non-crop diversification will be a promising strategy to deal with flood. Therefore, it can be said that in the recent time agricultural diversification is necessary to upgrade the agricultural sector or to adjust with the changing nature of the world economy.

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