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Agricultural Diversification: Need for Modern Farming

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***Abstract*— Agricultural diversification refers to the process by which farmers transition their farm businesses from conventional to high-value-added modern businesses. It boosts farm income, creates job possibilities, and helps farmers manage risk. Agricultural diversification has been proven to be the most effective technique for reducing risk in some naturally disturbed areas, such as flood-prone areas and drought-affected areas, according to the majority of research in the literature. With the relevance of agricultural diversity in mind, this paper attempts to examine the importance of adopting agricultural diversification in various areas of agriculture by studying various literature on the subject. Agricultural diversity, it goes on to say, stabilizes or protects farm revenue or production during natural disasters or market inefficiencies.**

***Keywords*— Agricultural diversification, Risk, Market imperfection, modern farming**

I. INTRODUCTION

Agriculture remains the primary source of food, nutrition, money, and employment for the majority of India's rural people. The country's agriculture is characterized by a large number of small and marginal scale farmers with small farm holdings. On the other hand, the country benefits from a diverse range of agro-climatic conditions, allowing farmers to produce a diverse range of agricultural products. Providing adequate food for a growing population without lowering holdings is a huge challenge. Because of the development of commercial agriculture practices during the post-independence period, the agriculture sector has been able to cater to both domestic and international markets. India's rich tradition of agricultural diversity continues to flourish, despite the increased emphasis on commercial farming. Only a few crops are grown on a huge basis year after year. This has resulted in the establishment of several biotic and abiotic constraints on the farm, as well as a decrease in the total benefits gained through farming.

Crop diversification provides farmers with more possibilities for cultivating a variety of crops in a single place, allowing them to expand their production activities while reducing risk. Crop diversification in India is frequently viewed as a move away from less profitable crops that were previously produced in favor of more profitable crops. Government policies, such as a focus on certain crops, market reforms, infrastructure development, government subsidies, and other price-related support mechanisms, also encourage crop diversification. Higher profitability and production stability can encourage crop diversity. Crop diversification and the growing of a diverse range of crops are employed in dry-land areas to reduce the risk of crop failure due to frequent droughts. In areas where soil issues are a problem, crop substitution and crop shift are also taking place.

The agriculture sector has grown significantly in the previous 50 years. From famine-like conditions in the early 1960s, the country has not only become self-sufficient in food grains but has also gained the essential resilience to weather the storm. Irrigation, research, extension, the provision of agricultural inputs at reasonable costs, farm mechanization, marketing support through the minimum price mechanism, and the development of FPOs, among other things, are all part of a policy framework that has resulted in increased food production. Despite substantial advances, India's agricultural business is nevertheless beset by poor infrastructure and the effects of climate change. Only around 40% of cultivated land is irrigated, leaving farmers on the remaining 60% of the land completely dependent on rainfall, which is subject to significant geographical and temporal variations in precipitation. Things have become significantly more difficult as a result of climate change. The vast majority of farmers in various parts of the country have yet to reap the benefits of adopting scientific methods and technology in agriculture. As a result, India's production levels for several important crops pale in comparison to those of agriculturally advanced nations. Farmers' capacity to benefit from the opportunities provided by liberalization is further limited by their poor capacities. In the coming years, agriculture's efficient and effective management will be important in achieving long-term self-sufficiency and assuring long-term growth.

II. NEED FOR MODERN FARMING

More than 70% of India's population lives in rural areas and is either directly or indirectly dependent on agriculture. It is defined in Indian agriculture by small and marginal farmer holdings. Due to the increasing population and the maximum number of animals, food and fodder are in short supply. The green, white, blue, brown, and yellow agricultural revolutions have made us self-sufficient in agricultural output. The technology used to attain our intended goal of agricultural production and productivity consumes a significant percentage of our natural resources. Soil erosion, toxicity, depletion of water resources, groundwater contamination, salinity, weed resistance, pest management, low-quality produce, and climate change are all negative outcomes of indiscriminate resource usage and uneven and judicious application of flawed production practices. Crop diversity could be one of the most important factors in agricultural sustainability and climate change mitigation. Crop variety reduces the chance of crop failure due to drought or unpredictably wet weather.

The agriculture sector's share of total GDP is expected to drop from 34.8 percent in 1980-81 to around 14 percent in 2020. Alternative sources of employment should be encouraged in the region to improve socio-economic conditions, such as agriculture, e-marketing, organic farming, advanced irrigation systems, extension, low-cost inputs, minimum support price policies, supporting infrastructure, and so on because the agriculture sector employs 60% of India's population. India made huge achievements in the agricultural sector after the 1960s, with wheat and rice production growing ten and four times, respectively. Participating in a variety of agricultural activities, such as dairy, poultry, pig, goat, sheep, rabbit, and other livestock is referred to as diversification. Because only a few kinds of cereal and pulses account for 75% of the world's food supply, diversification could become a critical approach for enhancing agricultural profitability. A greater emphasis is being placed on improving the food system's resilience. People are more vulnerable to natural resource exploitation, climate change, pests, and diseases as a result of their reliance, all of which are harmful to the environment's balance. Agricultural diversity contributes to the resolution of these problems. Agricultural diversity gives farmers more options, which has a direct impact on nutrition, social development, and economic development. Farmers can increase yields by using fertilizers, water, and other natural resources more wisely and efficiently in this style of farming. Crop rotation for increased agricultural output, innovative hybrid crops, improved livestock breeds, improved seed nutrition, and agroforestry are all examples of ecological labor.

Farmers can use agricultural diversification to help them escape poverty and improve their living conditions. Agricultural diversification will help the government meet its objectives for socioeconomic development, employment creation, and environmental protection. As a result of the current era's economic liberalization policies, India's agriculture sector is under pressure from both within and outside the country. Agricultural diversification will prove to be an efficient and effective management technique for achieving long-term self-sufficiency and development in the next years. As a result, Indian agriculture, as well as each farmer's agricultural business, must diversify to fight successfully against foreign competition. The government and farmers must adopt an effective agricultural diversification strategy to solve the difficulties brought by liberalization and globalization.

In India, producer-owned enterprises and cooperatives can help diversify the economy. The success of the Farmer Producer Organization (FPO) model has brought small farmers together and allowed them to better their lives by creating market connections and adding value. To address the issue of agricultural diversification, rational and policy interventions on both the input and output sides of insufficient subsidies are required. Farmers must also be mainstreamed through warehouse crop insurance, risk management, marketing, and good infrastructure, which will not only have far-reaching implications but also help the country reduce processed food imports. Diversification will, of course, allow Indian farmers to build long-term livelihoods.

III. NEEDS FOR AGRICULTURAL DIVERSIFICATION

Risk and agricultural diversification: Agricultural diversification and risk: In agriculture, the risk is an unmistakable occurrence. Risk is defined as the likelihood of negative outcomes in decision-making due to ambiguity and incomplete knowledge. Farmers in many parts of the world have tried various methods to mitigate agricultural risk. In any type of agricultural decision-making process, risk and uncertainty play a crucial part. Farmers have to deal with a lot of unpredictability daily. As a result, farmers are compelled to make judgments based on incomplete data. The danger of harm or loss arises from this ambiguity. Agriculture and agricultural supply chains are full of risk and uncertainty in varying degrees. This is due to a variety of factors, including 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 the domestic and international food and agriculture sectors. Risk management in agriculture is especially difficult since many threats are highly interrelated, affecting entire communities at the same time. Financial recovery is costly and challenging due to the extensive size of the resulting loss. The fiscal consequences of social safety net payments or infrastructure repair can be significant for governments. Insurers' reserves and financial stability are put to the test when a substantial number of policyholders incur abrupt losses. There is sometimes no other option for farming communities than to sell assets at distressed rates. As a result, the researchers discovered that managing risk in agriculture is difficult due to the high hazards and uncertainties involved. However, several risk-mitigation measures have been devised and implemented in agriculture to a great extent over time. Agricultural diversification has been identified as one of the most common risk-mitigation strategies in agriculture by several academics. The general justification for agricultural diversification stems from the opportunity it provides to decrease production and price risks, increase yields, preserve ecological balance, increase flexibility, and sustain productivity and growth. It also creates more jobs and raises earnings by making better use of resources and capitalizing on comparative advantage. Overall, agricultural diversification is a process that helps growers increase per capita revenue and reduce risk while also providing consumers with a wider range of food options. It reduces the danger of producing a single crop and aids the farmer's escape from poverty. When a farmer's agricultural revenue remains stable, he or she will be rewarded. Instability in farm income increases the risk of farming and makes it unprofitable. In this context, researchers discovered that agricultural diversity ensures farm revenue stability by reducing risk, as low returns from one crop are offset by good returns from others. According to T. Haque (1996), diversified farms have higher growth and stability of farm income because the risks of fluctuating production and market prices are minimized because all crops/enterprises on the same farm are not subjected to adverse weather, pest/insect attack, or price uncertainty during the same season or year. As a risk mitigation approach against production risk owing to harsh and uncertain agro-climatic conditions, diversification is highly valued. Income elasticity and price level have long been known to have a close and positive relationship. Farmers will increase agricultural output if they are offered greater prices for their

crops to take advantage of the new chances. Farmers will reduce crop production if the prices are given fall. Because fruits and vegetables have a high-income elasticity, they have a higher price, which has resulted in an increase in the area beneath them. The majority of high-value food items are labor-intensive, have short gestation periods, and yield quick profits. As a result, they provide an ideal chance for smallholders to make use of surplus labor and supplement their revenues. Diversification toward high-value food commodities, according to studies in South and Southeast Asia, encourages the development of creative supply chains and opens up new avenues for increasing income, creating jobs, and promoting exports.

Consumer Demands and Agricultural Diversification: The structure of consumer demand for food is changing as a result of urbanization and large-scale migration. Higher demand for high-value commodities is being driven by increased economic growth and incomes, as well as changes in tastes and preferences in both urban and rural areas. In comparison to cereals, high-value commodities, such as horticulture, livestock, and marine products, are known to be very expenditure elastic. When compared to staples like grains and pulses, the income elasticity of demand for fruits, vegetables, milk, and meat is high in all South Asian countries. Future growth is projected to come from the high-value sector, given increased incomes and higher expenditure elasticity for these items. Because of rising worries about dietary health, the market for non-traditional fruits and vegetables has exploded in recent years, helping to create a nutritionally balanced diet. These changes in purchasing patterns can be found not only in developed countries but also in emerging countries' urban and rural areas. Increased demand for non-food agricultural products is also linked to structural changes in demand, such as a wider variety of foods available, exposure to a variety of western culture dietary patterns, a premium for foods that require some preparation, more sedentary occupations, and separation of food consumption from production (for example, cut flowers, plant- and animal-derived textiles, and new sources of natural energy such as ethanol). As a result of changing consumer patterns, agricultural commodities might diversify vertically in terms of value-added. According to research by Pingali (2006), as lifestyle and economic levels change, India, like other Asian nations, is witnessing "Westernization of diets," in which the share of fresh and processed high-value foods is increasing, motivating farmers to produce high-value foods. India's consumption habits are shifting as a result of sustained economic growth, rising per capita income, growing urbanization, and widening globalization. Food security is no longer limited to cereal availability, but instead encompasses a varied food basket that includes high-value commodities including fruits, vegetables, milk, meat, eggs, fish, and processed goods. As a result, a continuous process of agricultural diversification may be seen in the shift in consumption patterns in favor of high-value food items. To recapitulate, to meet people's need for high-value-added commodities, agricultural diversification toward high-value commodities such as fruits, vegetables, meat, milk, and eggs has become a pressing necessity.

Urbanization, Rising Income, and Agricultural Diversification: Urbanization and people's income levels have a significant impact on agricultural diversification. This fact has been supported by various research on agricultural diversification. Per capita income and urbanization, according to Kumar and Mathur (1996), had a beneficial and considerable impact on the increase of livestock operations. Growing urbanization and rising per capita income is increasing demand for animal products in the consumer basket, resulting in livestock industry diversification. Bhattacharyya (2008) found that urbanization, a demand-side component, has a significant impact on the degree of diversity. In the mid-1990s, India attained food grain self-sufficiency, alleviating the country's food security problems. The Indian economy has regularly grown at a rate of around 6% per year over the years. Between 1991 and 2001, the urban population grew at a quicker rate than the rural population, with a compound annual growth rate of 2.8 percent compared to 1.7 percent for the rural population. These factors may be understood as together driving significant changes in Indian consumers' food baskets. As a result of urbanization, people's purchasing patterns shift toward high-value commodities, resulting in agriculture sector diversification. However, this is not always the case, and in this case, the researchers failed to highlight some circumstances. Though urbanization is increasing at a quicker rate in different parts of India, only a few states have taken advantage of the opportunities presented by urbanization by diversifying their agriculture to meet the growing need for food. Because these states have a better agricultural infrastructure and can diversify their crops than other urban growing states. Thus, it is established that there is a beneficial association between urbanization and agricultural diversification; however, this relationship is contingent on the existence of agricultural infrastructure in urban growth areas, such as irrigation, adequate road connectivity, marketing, and so on.

Food security and Agricultural Diversification: According to economic literature, agricultural diversification, particularly crop variety, is critical for agrarian economies to grow. It's been pushed in underdeveloped countries because of its ability to boost household earnings while also ensuring food and nutrition security. Crop diversification is widely viewed as a critical component in rising incomes, enhancing food security, and reducing poverty, following the success of the Asian Green Revolution. Crop diversification is a potential critical pathway for household food security and nutrition through income generated from the sale of agricultural produce at the household level. According to Joshi et al., (2003), a crop diversification portfolio that includes the cultivation of high-yielding and high-value crops has the greatest influence on household incomes. Mukherjee and Benson (2003) found that households who plant a varied range of crops are less likely to be impoverished. Agricultural incomes have also been found to help increase child nutrition, especially in homes with better health and education systems. The consumption basket in India is evolving. In both rural and urban settings, people are turning away from cereals and toward non-cereals. In both rural and urban areas, per capita, cereal consumption has decreased, while milk, milk products, vegetables, and fruits consumption has greatly grown. In the case of fruits, the most notable increase in consumption was seen. Diversification of crop and livestock sectors has expanded non-cereal commodity production while simultaneously increasing their consumption patterns, according to the available information. A more favorable climate for diversification

toward high-value commodities will not only relieve the pressure of storing massive surpluses of rice and wheat but will also help the agriculture sector grow faster through high-value commodities. Crop diversification is recommended in the literature for both family food security and nutrition security. Crop variety, however, may not be the best technique for ensuring household food security in some cases. Most developing countries, it has been discovered, still rely on crop concentration to sustain their initial degree of food security. Crop diversification increases farm revenue and improves household food and nutrition security, which is true. It is important to note, however, that cultivating high-value commodities is also a costly and risky procedure for small and marginal farmers. As a result, small and marginal farmers in developing nations will find it difficult to diversify their agricultural businesses without some institutional help. Cereals or food grains agriculture still dominates the cropping patterns of most emerging countries. As a result, crop concentration is their ultimate strategy for maintaining food security at the subsistence level. According to Engles law, people transfer their consumption from food to non-food goods when their income rises. However, poor countries' per capita incomes are low, and staple foods remain their top priority in their food baskets. In comparison to developing or underdeveloped countries, highly farm diversified countries in the world are developed because they favor high-value commodities more. As a result, food security and agricultural diversity should be thoroughly researched.

IV. CONCLUSION

Agricultural diversification develops the premise that agricultural sector diversification is required to manage both production and price risk, to meet changing consumer demand, to maintain various levels of food security or nutrition security, and so on. Agricultural diversification could be a viable alternative for farmers looking to increase farm revenue or provide indirect farm insurance in the event of agricultural enterprise collapse. However, efficient structuring of agricultural infrastructures such as irrigation, lending, and marketing, as well as an agricultural enterprise organization, are required for the successful operation of agricultural diversification. Furthermore, in flood-affected areas, non-crop diversification will be a viable flood-relief technique. As a result, agricultural diversification has become increasingly important in recent years to update the agricultural sector or adapt to the changing nature of the global economy.

REFERENCES

[1] Bhattacharyya, R. (2008): “Crop diversification: a search for an alternative income of the farmers in the state of West Bengal in India”, International Conference on Applied Economics, ICOAE, 2008

[2] Deshingkar, P., Usha, K., Laxman, R. and Srinivas, R. (2003): “Changing food systems in India: Resource sharing and marketing arrangements for vegetable production in Andhra Pradesh” Development Policy Review, ODI 21 (5–6): pp. 627–639

[3] Deshpande, R.S., Pradeep Mehta, and Khalil Shah (2007): “Crop Diversification and Agricultural Labour in India”, Indian Journal of Labour Economics, October- December. Vol.50, No.4

[4] Goyari, Phanindra (2005): “Flood Damages and Sustainability of Agriculture in Assam”, Economic and Political Weekly, Vol.40, No.26, pp. 2723-2729

[5] Gulati, Ashok and Kavery Ganguly (2008): “Beyond Grain Security: Agriculture Tomorrow India 2008”, The Business Standard, New Delhi

[6] Haque, T. (2010). “Constraints and Potentials of Diversified Agricultural Development in Eastern India”, Project Report, Project Sponsored by Planning Commission (Government of India), Council for Social Development (CSD) Sangha Rachna, 53 - Lodi Estate, New Delhi

[7] Heady, E.O. (1968): “Economics of Agricultural Production and Resource Use”, Prentice Hall, New Delhi

[8] Jha, Brajesh, Kumar, Nitesh, Mohanty, Biswajit (2009): “Pattern of Agricultural Diversification in India”, Institute of Economic Growth, North Campus, Delhi

[9] Joshi, P.K., Gulati, Ashok, Birthal, S. Pratap, Tewari, Laxmi (2004): “Agricultural Diversification in South Asia: Patterns, Determinants, and Policy Implications", Economic and Political Weekly, Vol. 39, No.24

[10] Kumar, P., and Mruthyunjaya (2002): “Long-Term Changes in Food Basket in India”, November 21- 23, Paper Presented in an International Workshop on Agricultural Diversification in South Asia, Jointly Organized by MOA, NCAP, IFPRI, Paro, Bhutan

[11] Kumar, P. and V.C. Mathur (1996): “Structural changes in the demand for food in India”, Indian Journal of Agricultural Economics, 51(4)

[12] Mandal, Raju (2010): “Cropping Patterns and Risk Management in the Flood Plains of Assam”, Economic and Political Weekly, August 14, 2010, No. 33, pp. 78-81

[13] Mukherjee, S. & Benson, T. (2003): “The determinants of poverty in Malawi, 1998”, World Development, 31 (2), pp339-358

[14] Paroda, R.S, and Kumar, P. (2000): “Food production and demand in South Asia”, Agricultural Economics Research Review, 13: pp. 1-24

[15] Passah, P.M. (2008): “Agricultural Growth and Diversification in Eastern and North-Eastern India in the Era of Economic Reforms”, Agricultural Development in North East India- Issues and Options, pp. 123-130

[16] Pingali, Prabhu (2006): "Westernization of Asian diets and the transformation of food systems: Implications for research and policy”, Food Policy, 32(2006), pp. 281-298.