

## Diversification of Agriculture in India: An Overview

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**ABSTRACT:** *Diversification of agriculture is an important aspect of agricultural sector as there is an increasing demand for non food grains by the population in recent years. Given the nature of demand and the characteristics of land as something that cannot be increased, it is one of the best alternatives for farmers as well as policy makers to rely upon. There is an increasing trend of diversification in India in recent years. Diversification can be within the crops or outside the crops such as milk, meat and wool production etc. However, the concept itself is an overlapping one and there are various issues associated with it. The objective of the paper is to look at these issues related to diversification of agriculture.*

**KEY WORDS:** *Concept of Diversification, Crop Diversification and Non crop Diversification*

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### I. INTRODUCTION

Agriculture plays an ever important role as a source of growth and instrument of poverty reduction. Farmer, land, crops and crop enterprises are the four main constituents of agriculture and hence any analysis of agriculture sector should account for the growth stimuli offered by these constituents as well as their responses to the policy tools. Agriculture, unlike other sectors, is a unique instrument for development because it contributes to development through important backward (demand) and forward (supply) linkages; as a source of livelihood; as a provider of environmental services; as a supplier of raw materials for agro-processing and agro-based industries. Rural non-farm economies are heavily dependent on it from both demand and supply sides. It provides market for manufacturers and acts as a source of foreign exchange earnings. Thus, the growth of this sector is of prime importance to policy makers.

Countries rely upon agriculture for equity and inflation control. World Bank Report, 2008 has categorised the agriculture dependent countries into three distinct rural worlds. They are a) Agriculture based countries: Here agriculture is a major source of growth, nearly accounting for 32% of GDP. Eighty two percent of rural Sub-Saharan population lives in agriculture based countries. b) Transforming countries: Here agriculture is no longer a major source of economic growth, contributing on an average 7 % to 12 % to GDP growth but nearly 82 % of all poor is rural. India is in this group along with China and Indonesia. 98 % of the rural population in South Asia, 96 % in EAP countries and 92 % in the Middle East and N. Africa are in this group. c) Urbanised countries: ECA and LAC countries are clubbed under this group. India-in the transforming group-along with China moved from agriculture based group to transforming group over the past 20 years. These countries have sharp sub-national geographical disparities. For example many transforming and urbanised countries have agriculture based regions such as Bihar in India.

If one classifies the regions within countries according to their agriculture potential and access to the markets, it is seen that 61% of rural population in developing countries lives in favoured areas- irrigated, humid and semi humid with little moisture stress and with medium to good market access( less than 5 hours from a market town of 5000 or more). The less favoured areas are defined as arid and semi arid and/or with poor market access. On the basis of the poverty maps, it is seen that the poverty rate is higher in less favoured areas but most of the poor live in favoured areas. This implies that if agriculture is to be used to reduce poverty it requires not only investments in less favoured areas but also targeting the large number of poor in favoured areas.<sup>1</sup>

In the context of India, agriculture holds the key to higher growth, poverty reduction and more equitable distribution of income. As per the Central Statistics Organisation (CSO) revised estimates (released on 31<sup>st</sup> January 2013) of Gross Domestic Product, agriculture and allied sectors grew at 3.6 per cent during 2011-12, recording an average rate of growth of 3.6 per cent per year during the 11<sup>th</sup> Plan (2007-12). The country has achieved self-sufficiency in the availability of food grains and has also become net exporter of food-grains. More importantly, Indian agriculture has transformed from a food grains deficit situation in the 60's to a so called 'surplus' sector (export of rice and wheat to the tune of 10 million tonnes).<sup>2</sup> Given this scenario, diversification in agriculture has played an important part in the growth of agricultural output.

The share of agriculture and allied sectors in the total GDP declined from around 19 per cent in 2004-05 to 14 per cent in 2013-14, calculated at 2004-05 constant prices (GSO). If the shares of forestry and fishing are removed, agriculture (including livestock) accounted for about 12 per cent of the national GDP. However, with around 50 percent of the population still dependent on agriculture for its livelihood, the sector continues to play a vital role through its multiplier impact on the economy.

In this context, Diversification of agriculture towards horticultural crops and/ or animal husbandry plays an important part in growth of agriculture. The present paper tries to highlight the concept of diversification in agriculture and the important terms associated with. The paper is divided into five sections including the section of Introduction. Section II discusses the concept of Diversification. Section III discusses various issues in diversification of agriculture. In section IV, diversification in Indian Agriculture has been looked into. The paper is based on secondary information. Simple statistical tools such as growth rates and help of excel have been taken for charts and figures.

## II. CONCEPT OF DIVERSIFICATION IN AGRICULTURE

Though diversification is an integral part of structural transformation in agriculture, the concept of diversification conveys different meanings. Generally it means a movement of resources (labour) from agriculture to industries or say a country is diversifying at macro level from primary sector to secondary or tertiary sector.

Thus, Diversification in agriculture (henceforward diversification) can be defined as “the entrepreneurial use of farm resources for a non-agricultural purpose for commercial gain.” Hence, diversification reflects the reduced dependence of farmers on agriculture as a source of income. It also implies some kind of entrepreneurial activity on behalf of the farmer. There are some obvious activities that are included as diversification within the above definition such as tourism, sport, recreation, processing, etc. and others that are not such as the production of organic or novel crops, which whilst possibly reflecting a change in focus and possibly entrepreneurial activity by the farmer remain agricultural activities. Off-farm employment or investment incomes are not regarded as diversified activities as they do not utilise farm resources.

Diversification is often considered as an important farm management strategy to combat risk. Production risk is reduced in diversification as different crop enterprises have different degree of resistance to adverse situations. In rural development context, it is usually posed in terms of either of the need for on-farm changes in the mix of agricultural activities or of the desirability of developing rural based non-farm industries. The former sets out to correct the dangers of undue reliance on a single main farm output when it faces unstable and declining prospects in national or international markets, while the latter seeks to provide alternative full time employment for rural dwellers in locations other than cities. In both cases diversification is thought of as changing the nature of full-time occupation rather than enabling a single individual or household to engage in multiple occupations.

In the context of industrial country agricultural economies, it has been referred to as ‘pluriactivity’. When dealing with pluriactivity, too much emphasis is given to labour input employed off the farm, whereas the term diversification is used when the farm’s resources are engaged in alternative farm enterprises (AFE) inside the farm itself in order to generate a new source of income. An AFE may be performed in the form of either agricultural diversification or business diversification. In the first case, it is better defined as conversion (adoption of any crop or livestock different from the traditional ones) and/or extensification (adoption of set-aside, extensive farming/grazing practices, organic farming or afforestation). In the second case, it implies non-agricultural use of the farm’s assets and members. Some of them add value to their farm enterprises through the processing of their original products and/or the direct marketing of fresh or transformed farm products<sup>3</sup>. Others offer tourism services such as accommodation (with or without self-catering possibility). A farm is engaged in pluriactivity when all household members contribute to its income, and thus to its viability, earning from agricultural and/or non-agricultural activities, whether on or off the farm<sup>4</sup>. Part-time job fits in well with this farm pattern, since it may represent a feasible response to technological changes and market liberalisation, as demonstrated by different studies.<sup>5</sup>

In many of the poor developing countries including Sub-Saharan African countries, diversification is widespread across all farm sizes. One should not treat diversification of livelihood as synonymous with sectoral diversity i.e. agricultural diversity within the rural economy since a high degree of household level diversity may exist even in the context of a relatively undiversified rural economy in sectoral terms<sup>6</sup>.

Thus, one can safely infer that agricultural diversification is part of household diversification strategies either to minimise the risks and sustenance or to have incremental income whereas the later i.e. household diversification strategies are possible without agricultural diversification. Similarly one can say that agricultural diversification may or may not include crop diversification but crop diversification is certainly a part of agricultural diversification. Implicitly, it is assumed that while discussing the agricultural diversification farmers who either till their own land or till others’ land on lease are included. Here one is concentrating only on land holders. Livestock and fisheries are possible with virtually no land whereas horticulture requires land. Thus, one

can argue that “agricultural diversification” definitely is a broader concept than ‘crop diversification’ per se and it can include non arable land also as these lands could be used for allied activities.

Agricultural Diversification means a shift of resources from one crop (or livestock) to a larger mix of crops and livestock. Diversification takes place when the farmers have the strength to take risks. According to Vyas (1996)<sup>7</sup>, diversification in agriculture could suggest any one or all of the following three situations. Firstly, diversification can be a shift from farm to nonfarm activities which according to him is more of a diversification of the rural economy rather than diversification in agriculture. Secondly, it can mean a shift from less profitable crop or enterprise to a more profitable crop or enterprise which is a response of farmers to price signals and their efforts to adjust to changes in market conditions and lastly, diversification can be interpreted as the use of resources in diverse but complementary activities which implies that there is a slack in the system and exploitation of the unemployed or under employed resources would raise the income frontiers. Diversification in agriculture is done usually with risk and to increase the farmer’s income. One can say that it is a movement of resources from low value commodity mix (crops and livestock) to a high value commodity mix (crops and livestock). It can be a shift from subsistence farming to commercial farming and or from low value food/non-food crops to high value food/non-food crops and switch over from local to high yielding varieties. Diversification can be on-farm or off-farm diversification. In case of the former, there can be switch off from low value crops to high value crops like oilseeds, pulses, cotton, fruits and vegetables, floriculture, medicinal plants, fisheries, livestock, poultry and bee keeping etc. It also means use of new technology and use of new agricultural practices used for existing crop cultivation.

Agricultural diversification should not be confused with rural livelihood diversification. The latter is defined as the process by which rural households construct an increasingly diverse portfolio of activities and assets in order to survive and to improve their standard of living. It comprises of assets, activities and access mediated by institutions (land tenure, common property and real markets etc.), social relations (village, gender and ethnicity etc) and organisations (Government Agencies, Community groups & NGOs etc). A typical household is diversifying his agricultural activities between crop and livestock and forestry ie gathering although he may not be going for crop diversification. Thus, agricultural diversification is a part of the rural household diversification (we presume here that rural economy is predominantly agricultural) and crop diversification is a part of agricultural diversification.

Now, the question is who can go for agricultural diversification? Is it only big farms or farms at a collective level or is it small and marginal farmers also? Who does it for what purpose? Say, a medium farmer may go for augmentation of higher income whereas a small farmer may go for maintaining a subsistence level of income given the same assets. If the farming conditions are different then diversification of agriculture may be different across space, size of the farm notwithstanding. Similarly a small farmer may go for diversification if his farm is in the vicinity of urban areas, is well connected to markets and there is a good demand for the particular product he grows i.e. his farm is capable of producing the product demanded. A large farmer in a disadvantaged area may have to restrict himself for producing one or two crops and virtually no diversification at all. Thus, assets along with access and farm sizes can shape agricultural diversification. The aim behind agrarian diversification is to support existing farming systems for livelihood security and/or enhanced income of the farming communities.

Further, farmers on their part are aware of having to adapt their behaviour not only to the restructuring of the agricultural sector, but also to the high market requirements. They are asked to satisfy consumers demanding more guarantees in terms of safety, quality and traceability along the food processing chain<sup>8</sup>. For some of them, diversification strategy is a necessary choice for survival; for others, a process of accumulation. For all of them, it represents an opportunity to grow and become more competitive, to cope with common Agricultural Policies as well as the changing market condition.<sup>9</sup>

Thus at macro level diversification is shift from farm to non-farm activities, shift to high value commodities/enterprises, and use of resources in diverse and complementary activities and at micro level it is to meet household food security. It can be seen as minimizing production and marketing risks and generating additional income. Though at conceptual level, it looks quite easy to comprehend but in reality, it is an overlapping concept partly because clear macro level (aggregate) data is not available and also the decision to diversify entirely depends on the farm household level which further is constrained by size of the farm, climate, productivity of land and adaptation to available technology etc.

Moreover, diversification can be visualised in two ways, i.e. diversification to high income enterprises as a growth strategy or its familiar role as a strategy to cope with risk and uncertainty either in subsistence farming system or even in highly specialised situations. Sometimes, one fails to distinguish between these two strategies and one has to remember that risks are there in both these strategies. Van Braun (1995)<sup>10</sup> observes that the return to land and labour are in general, substantially higher for the new crops or the crops grown under new technology. Land productivity in new crops is substantially higher than in the subsistence crops. According to him, commercialisation and diversification of agriculture can affect the structure and level of employment. The increased income stream for hired labour is an indirect benefit that goes beyond the effects on directly

participating farms. Similarly, women generally work much more on the subsistence crops than they do on the commercial crops.

Based on various definitions, the nature of diversification can be broadly described as (i) a shift of resources from farm to non-farm activities, (ii) use of resources in a larger mix of diverse and complementary activities within agriculture and (iii) a movement of resources from low value agriculture (crops and livestock) to high value agriculture (crops and livestock) .<sup>11</sup> Off late, the diversification is more towards non-food crops such as vegetables and fruits and other complementary activities such as animal husbandry and poultry etc. There are various reasons for this steady increase in diversification such as increased demand, access to markets, increasing urbanisation and availability of infrastructures.

It would be misleading if one equates diversification with specialisation. Diversification and specialisation are inverse to each other. A diversified household distributes its efforts across many activities e.g. food crops, several cash crops, livestock and off farm activities whereas a specialised household distributes its efforts across a few activities. It focuses on a few cash crops and buys most of its food. The main argument in favour of specialisation is that it is needed in the long run to drive income growth and to reduce poverty. Over time those who don't specialise will either be pushed out of agriculture or will remain poor. On the other hand, in the absence of crop rotation, agricultural specialisation has a tendency to get attacked by pests and weeds. This asks for huge reliance on pesticides and other chemicals to get rid of them. For similar reasons, a huge amount of fertilizers is also required. Again for specialisation, size of farm is important. Unless the farm size is large, specialisation is not viable and for a typical country like India the size of land holding is so fragmented that specialisation is not a very good alternative for increased production.

Diversification is one of the components of growth in the cropping sector along with others namely area, yield and price. Diversification or cropping pattern mix can influence growth by altering allocation of resources. Crop diversification influences growth of crop output through its impact on income and risk. From economic point of view, diversification works as a mechanism for incorporating risk aversion into a farmer's decision making process. Change in cropping pattern is traditionally a popular mode of diversification which has far reaching impact on development of agriculture.

Diversification can be spatial or temporal. Spatial diversification has three components i.e. diversity in cropping pattern, spread of cropping pattern and land allocation in favour of high value crops. On the other hand, temporal diversification is due to changing market and technological conditions. It is about shift in cropping pattern. The extent of diversification at macro (state or district) level doesn't always lead to the same level of diversification at micro (farm) level. Given a heterogeneous nature of climatic zones, there is a possibility that diversity of cropping pattern at macro level may lead to higher level of specialisation at micro level.

It may further be divided into crop (diversifying from one to different crops) diversification and non-crop (fishing, dairy and poultry etc) diversification. From the above discussion one can infer that diversification in agriculture is a part of rural household livelihood strategies.

### **III. AGRICULTURAL DIVERSIFICATION: SOME ISSUES**

Agricultural diversification has different issues from different prospective with regard to its importance/influence on these issues. While discussing the issue of agricultural diversification, its implication for nutrition cannot be ignored. At the household level, consumption expenditure surveys by the National Sample Survey Organization reveal declining consumption of cereals and increases in livestock and horticultural products, sugar and edible oils implying an average improvement in nutritional status. These, as well as, the results of the surveys of the National Nutrition Monitoring Board bear out gains in calorie and protein content of diets, essentially from improvements in non grain food consumption, driven by income growth and poverty reduction. These surveys, however, also reveal the inequities across regions, farms of different sizes, socio-cultural groups, as well as in intra-family distribution of food. To illustrate, nearly 26 per cent of the rural farming households, mainly sub-marginal and marginal farmers, were nutritionally deprived. The surveys conducted by the National Nutrition Monitoring Bureau show that the diet of urban and rural poor is deficient in several nutrients, notably vitamins and minerals. Diversification to nutrient-rich millets, fruits, vegetables and livestock products can help bridge the gap in nutrient intakes provided these foods are accessible to the poor.

However, it is argued that there is a threat to food security if one diverts land and other resources to high value crops. The decline in area of coarse cereals and pulses and other so-called 'low-value' crops which provide access to better nutrition for the poor illustrates this concern. The apprehension is that increasing diversification of land to non food crops may affect basic food security adversely. Stagnation or decline in area under food grains would undermine our self-sufficiency in food. Some projections suggest massive imports of food grains, driven by rising food needs of a growing population and for animal consumption. A country of India's size cannot reliably depend on the world market to meet these needs. This perception is countered by the scientific community. They contend that productivity levels are very low for most of the crops and animals. Exploitation of this yield gap through research can ease the pressure on land resources substantially. It was also

pointed out that animal production systems in India are based on by-product and waste utilization. Increased efficiency of this system would moderate demand for food grains for animal consumption.

On the other hand, substitution of these crops by those with higher productivity has improved calorie availability and incomes of farmers who can increasingly afford better nutrition. Over the last 10-15 years, there has been a remarkable increase in production of horticultural crops, livestock and fisheries in India driven particularly by increased domestic demand. Average per capita consumption of these commodities has increased. Also, almost all the increase in food grain production has come from wheat and rice. The production of coarse grains (millets) and pulses has declined or remained stagnant, implying a decline in per capita availability of these commodities over time. Coarse grains have been important in the diets of the poor. These have relatively higher nutritive value in terms of proteins, vitamins and minerals compared to rice. Declines here thus affect food security of the poor qualitatively. Similar are the implications relating to pulses which are the major source of protein in vegetarian diets. Both pulses and coarse grains are important crops for dry land and fragile environments where poverty levels are high. Legumes have been the traditional restorer of soil fertility and declining area poses a threat to sustainability.

One must understand that nutritional security goes beyond food security as one understands the term. The latter means ensuring adequate availability of food grains to provide calorie and, may be, protein needs of the people, while the former implies adequate supply of micronutrients such as vitamins and minerals as well. As one moves up the development ladder, this becomes a more relevant indicator of food security. To ensure nutritional security, increased availability of diverse types of food such as millets, pulses, fruits and vegetables, foods of animal origin (milk, eggs, meat, fish), besides cereals, is essential. While fruits and vegetables are rich sources of micronutrients, animal-based foods abound in quality proteins as well. Vegetables and fruits also contain some health-giving phytochemicals which are powerful antioxidants and detoxifying agents which protect against degenerative diseases. Marine fish is a rich source of long chain n-3 fatty acids which have important physiological role.

Nutritionists evaluate nutritional security in terms of adequacy of macro and micronutrient with reference to clinical nutritional norms. NNMB Surveys indicate that, in general, the consumption of cereals and millets in rural and tribal groups was comparable to balanced diets, but the intakes were low in urban slums. The consumption of micronutrient-rich foods such as green leafy vegetables, other vegetables and fruits falls below recommended levels, particularly among the poorer population groups. These studies also show sub-standard consumption of green leafy vegetables, milk, fats and oils, sugar and jaggery in the diets of children. The deficit in mean energy intakes among children of pre-school and school age was about 25 percent. In case of rural pregnant and nursing women, vitamins A, C, and B complex and calcium deficits were higher than those of energy and protein. Both these kinds of surveys suggest the need to look beyond total production, availability, and average profiles.

Economists view food consumption as driven by self-provisioning, food habits (including changes therein), education, incomes, prices, and availability. These and other interacting variables determine the food choices of households as consumers. Empirical studies on recent Indian data indicate that, on the average, calorie consumption has ceased to be income-responsive, implying a switch to non-calorie food with further income growth. At lower end of the income distribution, however, overcoming calorie deficiency remains a priority. All these analyses point to the need for proper targeting of food intervention programmes. Universal public distribution programmes have outlived their utility.

Studies for prosperous states such as Punjab<sup>12</sup> show that the government is emphasizing the promotion of diversification. Declining diversification (since farmers go for one crop) has impacted the farming community in terms of over use of natural resources, ecological problems and growing income risk. Diversification can be promoted by promoting alternatives to the wheat-rice system. As the diversity in the production declines, variability in the gross value of production also declines. The farmers', especially small and marginal farmers' economic conditions cannot be improved unless there are changes in the cropping pattern and technology of production. Diversification can either be in the form of variety of crops grown or technologies used for the same set of crops.

There have been instances of ecological degradation in the wake of growth in such enterprises. Brackish water aquaculture, massive use of pesticides on fruits and vegetables, biodiversity erosion, salinization and water logging in Punjab-Haryana and parts of Rajasthan, are examples of consequences of diversification, but these instances need to be carefully diagnosed because analysts attribute these negative externalities to deficiencies in policies relating to pricing, investments etc. There has been increasing price variability of agricultural commodities especially perishable products after economic liberalisation when India joined the WTO. This is generating more marketing risks for agricultural producers. It is observed that small and marginal farmers are being marginalised day-by-day due to the increasing variability of prices. Again the farmers are not fully geared up to face the problems due to change in technology, social and human environment. The real challenge would be to achieve such intensification in an ecologically benign manner, through appropriate policies and technologies.

Infrastructural constraints are also important. Most of the commodities in the new diversification basket were traditionally confined to local markets in unprocessed form and in small volumes. Facilities like cold chains, refrigerated transport, modern abattoirs, processing plants and other infrastructure were not relevant. Now the market is global and weak support in infrastructure restricts growth prospects. Similar constraints emerge on institutional infrastructure. Extension, market, credit, information – all have focused on food and commercial enterprises of major importance. In the present context, these create bottlenecks.

Moreover, there is also an apprehension that shifts from traditional foods many of which are rich in vitamins and micronutrients would result in decline in nutritional quality of diets, as pointed earlier. Substitution of millets by wheat and rice, for example, does not auger well for poor consumers who cannot afford supplementary alternatives. Fall in consumption of pulses is also a cause for concern. This nutritionally regressive substitution in production patterns arises from technology and price changes which affect profitability and incomes of producers. Undervaluation of nutritive food by consumers as well as the markets is led by lack of nutritional awareness. Nutrition scientists highlight such dimensions of commercially- driven diversification and plead for investment in nutrition education.

In conclusion, one can say that there are two sets of arguments. One is that diversification of agriculture in favour of more competitive and high value commodities is considered to be an important strategy to overcome many of the challenges faced by Indian agriculture. It can be used as a tool to augment farm income, generate employment, alleviate poverty and conserve precious soil and water resources<sup>13</sup>. The other argument is that diversification towards high value commercial crops will lead to squeezing of raw material supplies and basic food items which form the basis of rural employment diversification by farmer as well as landless households<sup>14</sup>. There are supply side factors as well as demand side factors influencing agricultural diversification. Supply side factors are technology, infrastructure, extension services, market linkages, resource endowments and socio-economic factors. Demand side factors are population growth, income growth, urbanization, change in taste and preferences and export potential. Diversification at farm level can be strongly influenced by different agro-climatic and soil environments, difference in the quantity and quality of resource conditions such as irrigation intensity, price risk, farm net worth and farm size and land tenures, off-farm work, education and environmental variation.<sup>15</sup>

#### **IV. DIVERSIFICATION OF AGRICULTURE IN INDIA**

Diversification in India was primarily from the angle of risk and food security before the introduction of green revolution. Growth of selected crops due to green revolution led to what can be termed technology-led diversification. This type of resource led (resources like assured irrigation, HYV seeds, chemical fertilisers and pesticides provided to farmers at a subsidized rate) diversification resulted in specialisation/concentration of crops in certain specific regions.

However, over the seventies and the eighties, there was a growing preference of consumers towards non food-grain items of food like milk, poultry, meat, fish, vegetables and fruits which was a clear sign of increasing diversification of agriculture in 1980's. After the post reform period of 1990's, Indian agriculture entered the phase of globalisation and diversification. Higher income growth and increased per capita income during 90's led to price led diversification. Areas were shifted to crops whose demand increased and consequently price was increasing at a faster rate. Liberalisation in the 90's created an opportunity for increasing the benefits by changing cropping pattern to high valued crops.

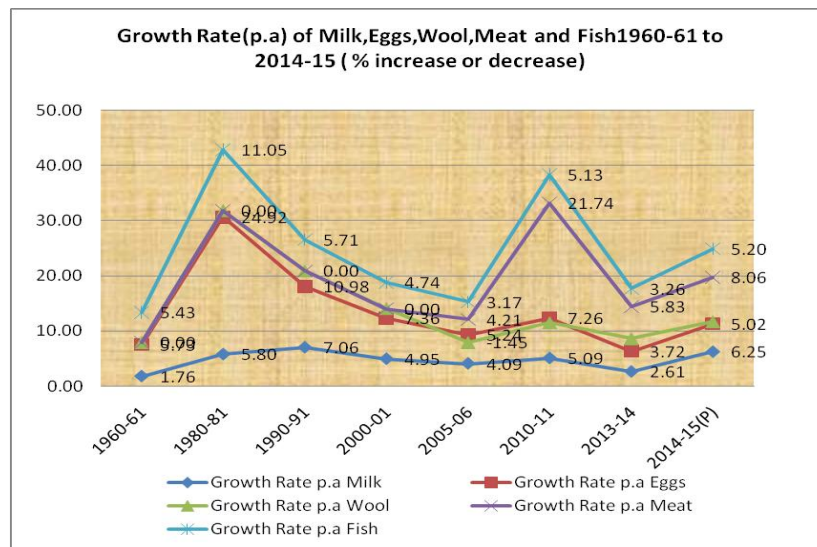
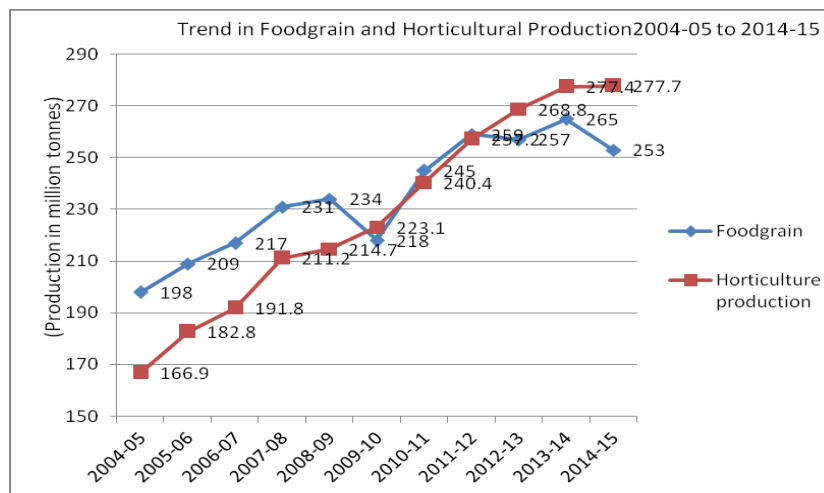
The factors that led to diversification of agriculture have varied over time. In the beginning, irrigation played most important role. Abundant and cheap supply of electricity also fostered specialization. Since early eighties, credit availability emerged as a significant determinant of diversification. Smaller farms continued to face rigidity in cropping pattern and they diverted their attention to livestock enterprises. At the end of the millennium, there was consensus that diversification to high value enterprises like vegetables, fruits, other specialty crops, livestock products, fisheries, value added agricultural products etc, was the new pathway for income growth in agricultural and rural sector<sup>16</sup>.

The base year for national accounts has been revised from 2004-05 to 2011-12. As per the new series, the Gross Value Added (GVA, earlier referred as Gross Domestic Product) at 2011- 12 basic prices for the agriculture and allied sectors grew to Rs. 15.82 lakh crores in 2014-15 from Rs. 15.79 lakh crores in 2013-14, or 0.2 per cent. The GVA growth rate for the agriculture and allied sector during 2013-14 was 3.7 per cent; the sub-sectoral growth in agriculture including livestock was 3.9 per cent, in forestry and logging was 0.3 per cent and in fishing was 5.8 per cent. The slower rate of growth in the agriculture sector during 2014-15 was mainly on account of a deficient monsoon, which affected the production of kharif crops. The situation aggravated due to unseasonal rainfall and hailstorms in certain parts of the country in 2015 during February and March, which affected the production of rabi crops as well.

The much talked about green revolution had a greater focus on rice and wheat under irrigated condition bypassing crops and regions under rain fed or dry land conditions (which is three-fifths of the 141 million hectares of net sown area in the country during 2003-04). The neglect of agriculture in plan resource allocation

has led to a decline of public investments in irrigation and other related infrastructure. Supply of credit from formal sources to the agricultural sector is inadequate leading to greater reliance on informal sources at higher interest burden. With changing technology and market conditions the farmer is increasingly being exposed to the uncertainties of the product as well as factor markets

One major thrust of the new agricultural policies is crop diversification. The Government of India is shifting its policy focus from basic cereal production to production of so called high value non-food commercial crops, especially vegetables, fruits and flowers. The trend in food grain and horticultural production (in million tonnes) over the last 10 years is in following graph. It shows that over the years, the production of Horticultural crops is steadily increasing and it is more than food grain production since 2011-12. Similarly, the average annual growth rate of fish, meat, eggs and milk production etc shows an increasing trend.



## V. SUMMING UP

In India, diversification in agriculture is taking place over time. In the seventies and eighties, there was a growing preference of consumers towards non food-grain items of food like milk, poultry, meat, fish, vegetables and fruits which was a clear reflection of increasing diversification of agriculture. After the post reform period of 1990's, Indian agriculture entered the phase of globalisation and diversification. Higher income growth and increased per capita income during 90's led to price led diversification. Areas were shifted to crops whose demand increased and consequently price was increasing at a faster rate. Liberalisation in the 90's created an opportunity for increasing the benefits by changing cropping pattern to high value crops.

Historically, agricultural diversification is happening across the globe not withstanding causes and constraints. In India one does see that there is a trend of increasing diversification in agriculture. The food basket is having a significant change in favour of high value food commodities such as fruits, vegetables, milk, meat, eggs and fish. Commercial oriented diversification is found in high diversification & high income states such as Maharashtra & Karnataka.

Future emphasis of agricultural policy ought to be on maximising farm household incomes rather than generating food surpluses. In this context the government has a difficult task to perform. On the one hand, continued food security needs to be assured to the marginal and small farmers whose numbers are growing in absolute terms. On the other hand, research and infrastructural investments need to be made by policy makers for diversification out of the primary staples. Appropriate government policies can alleviate many of the possible adverse transitional consequences arising from the process of diversification. Long term strategies to facilitate a smooth transition to commercialisation include investment in rural markets, transportation and communications infrastructure to facilitate integration of the rural economy. Further, higher investments in research is needed to increase crop productivity. Similarly, more emphasis should be given on research and development in crop management and extension activities for increasing the flexibility of the farmers in their decision making process to reduce possible environmental problems arising from high input use pattern. The provision of land rights and water is required for reducing risks to farmers and providing incentives in sustaining long term productivity. Long term strategies to facilitate a smooth transition to commercialisation of crops include investment in rural markets, transportation and communications infrastructure to facilitate integration of rural economy .

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