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ROLE OF AGRICULTURE DIVERSIFICATION IN INDIA

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"India's economic growth still largely depends on agriculture. Modern technologies integrated with agriculture and agro-food industry will revolutionize this sector and produce large-scale employment and thereby wealth" -- Dr. APJ Abdul Kalam

Abstract: Agriculture is one of the oldest and most important occupations of man. Development of agriculture is important for any country since it provides for the basic ingredients which are necessary for the existence of mankind. In India, Agriculture being the major source of **economic growth** by contributing towards more than 50% to the National Income thereby requires Agricultural diversification. **Agricultural diversification** can be facilitated by technological breaks-through, by changes in consumer demand or in government policy or in trade arrangements, and by development of irrigation, roads, and other infrastructures. Indian agriculture has witnessed diversification with impressive improvements in the shares of livestock and fisheries sectors in the total income from agriculture. Within the crop sector, the diversification has largely been in favor of non-food grains crops. However, diversification has not been essentially for **income generation**, but also for the risk-mitigating proposition. Indian Agriculture had reached the stage of **development** and maturity much before the now advanced Countries of the World embarked on the path of progress. Conversely, it can be impeded by **risks** in markets and prices and in crop-management practices, by degradation of natural resources, and by conflicting socio-economic requirements - perhaps for employment generation, or for self-sufficiency or foreign-exchange-earning capacity in particular crops or livestock or fishery or forest products.
This paper is seeking to explore the Role of Agriculture diversification in Indian perspective, its Concepts, rationale and approaches and recognize that agricultural diversification helps achieve food security, improved human nutrition and increased rural employment; it can also impact favorably on soil fertility and pest incidence. India's agro-climatic regional planning has documented the zones of maximal opportunity for diversified agriculture on smaller farms. Planning (at local and regional scales) to utilize those opportunities - and to provide the supportive agro-processing and market and communications facilities - must involve farmers' representatives and cooperatives, administrators, researchers, inputs suppliers (public and private), and NGO's; it must address on-farm and non-farm features.
Keywords: Agriculture Diversification, Development, Economic Growth, Income generation, Risk.

I. Introduction

In the agricultural context, diversification can be regarded as the re-allocation of some of a farm's productive resources, such as land, capital, farm equipment and particularly in richer countries, non-farming activities such as restaurants and shops. Factors leading to decisions to diversify are many, but include; reducing risk, responding to changing consumer demands or changing government policy, responding to external shocks and, more recently, as a consequence of climate change. While most definitions of diversification in developing countries do work on the assumption that diversification primarily involves a substitution of one crop or other agricultural product for another, or an increase in the number of enterprises, or activities, carried out by a particular farm, the definition used in developed countries sometimes relates more to the development of activities on the farm that do not involve agricultural production. In developing countries such as India, which has been one of the leaders in promoting diversification, the concept is applied both to individual farmers and to different regions, with government programs being aimed at promoting widespread diversification. The concept in India is seen as referring to the "shift from the regional dominance of one crop to regional production of a number of crops. The economic returns from different value-added crops with complementary marketing opportunities".

The concept of diversification at the macro level is a move away from agriculture to secondary and tertiary sectors (industry and service sectors) owing to change in consumer's expenditure due to sustained economic growth and rise in per capita incomes. This is reflected in the contribution of different sectors to national income and absorption of labor force. India is no exception as reflected in the declining share of agriculture in the country's GDP. With economic development diversification also occurs within each sector /sub-sector. For example, in agriculture diversification is taking place within each sub-sector (crops, livestock

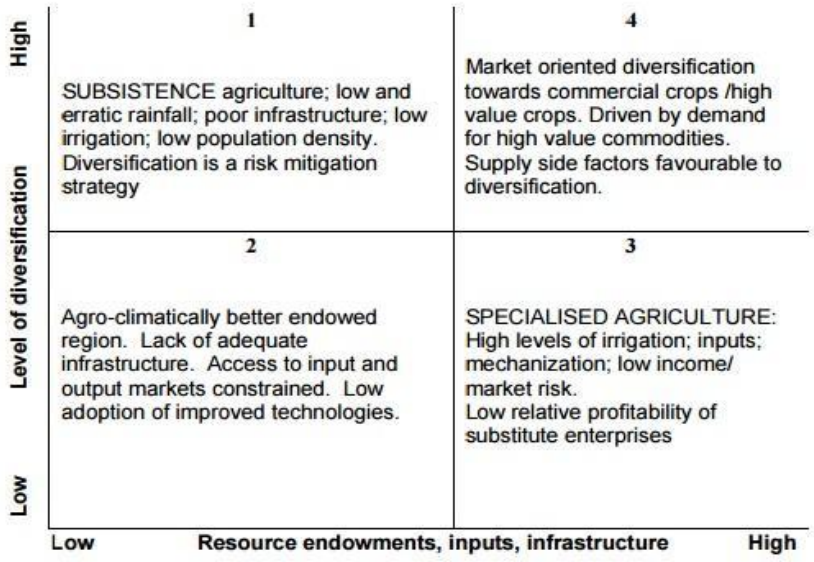
forestry etc.) and across sub-sectors.

At the conceptual plane diversification of agriculture could be classified into the following three categories:
1. Shift of resources from farm to non-farm activities;
2. Shift of resources with in agriculture from less profitable crop or enterprise to more profitable crop or enterprise;
3. Use of resources in diverse but complimentary activities (Vyas 1996; Delgado and Siamwalla 1999).

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. Here diversification will involve growing more staples. With commercialization of agriculture diversification is a strategy to generate additional income through use of available resources in diverse and complimentary activities. Here, diversification is a move away from traditional crops to high value crops that are more market oriented, leading to progressive substitution out of non-traded inputs in favour of purchased inputs (Pingali and Rosegrant 1995). Thus, although the objective of diversification may vary depending on the level of agricultural development, over all diversification is a strategy for poverty alleviation, employment generation, environmental conservation, and augmentation of farm income through better use of available resources (Satyasai and Vishwanath 1996, Ryan and Spencer 2001).

In making decisions about diversification farmers need to consider whether income generated by new farm enterprises will be greater than the existing activities, with similar or less risk. While growing new crops or raising animals may be technically possible, these may not be suitable for many farmers in terms of their land, labor and capital resources. Moreover, markets for the products may be lacking. The United Nations Food and Agriculture Organization (FAO) has been one of the development organizations promoting diversification by small farmers and has produced booklets identifying beekeeping, mushroom farming, milk production, fish ponds and sheep and goats, among others, as diversification possibilities.

Figure 1—Diversification of agriculture and resource endowments (Schematic)



II. Crop Diversification In Indian Perspective

With the advent of modern agricultural technology, especially during the period of the Green Revolution in the late sixties and early seventies, there is a continuous surge for diversified agriculture in terms of crops, primarily on economic considerations. The crop pattern changes, however, are the outcome of the interactive effect of many factors which can be broadly categorized into the following five groups:

a) Resource related factors covering irrigation, rainfall and soil fertility.

b) Technology related factors covering not only seed, fertilizer, and water technologies but also those related to marketing, storage and processing.

c) Household related factors covering food and fodder self-sufficiency requirement as well as investment capacity.

d) Price related factors covering output and input prices as well as trade policies and other economic policies that affect these prices either directly or indirectly.

e) Institutional and infrastructure related factors covering farm size and tenancy arrangements, research, extension and marketing systems and government regulatory policies.

Obviously, these factors are not watertight but inter-related. For instance, the adoption of crop technologies is influenced not only by resource related factors but also by institutional and infrastructure factors. Similarly, government policies - both supportive and regulatory in nature - affect both the input and output prices. Likewise, special government programs also affect area allocation and crop composition. More importantly, both the economic liberalization policies as well as the globalization process are also exerting strong pressures on the area allocation decision of farmers, essentially through their impact on the relative prices of inputs and outputs. Although the factors that influence the area allocation decision of farmers are all important, they obviously differ in terms of the relative importance both across farm groups and resource regions. While factors such as food and fodder self-sufficiency, farm size, and investment constraints are important in influencing the area allocation pattern among smaller farms, larger farmers with an ability to circumvent resources constraints usually go more by economic considerations based on relative crop prices than by other non-economic considerations. Similarly, economic factors play a relatively stronger role in influencing the crop pattern in areas with a better irrigation and infrastructure potential. In such areas, commercialization and market networks co-evolve to make the farmers more dynamic and highly responsive to economic impulses.

What is most notable is the change in the relative importance of these factors over time. From a very generalized perspective, Indian agriculture is increasingly getting influenced more and more by economic factors. This need not be surprising because irrigation expansion, infrastructure development, penetration of rural markets, development and spread of short duration and drought resistant crop technologies have all contributed to minimizing the role of non-economic factors in crop choice of even small farmers. What is more, the reform initiatives undertaken in the context of the ongoing agricultural liberalization and globalization policies are also going to further strengthen the role of price related economic incentives in determining crop composition both at the micro and macro levels. Obviously, such a changing economic environment will also ensure that government price and trade policies will become still more powerful instruments for directing area allocation decisions of farmers, aligning thereby the crop pattern changes in line with the changing demand-supply conditions. In a condition where agricultural growth results more from productivity improvement than from area expansion, the increasing role that price related economic incentives play in crop choice can also pave the way for the next stage of agricultural evolution where growth originates more and more from value-added production.

III. Rationale - Diversification Can Be A Response To Both Opportunities And Threats

In making decisions about diversification farmers need to consider whether income generated by new farm enterprises will be greater than the existing activities, with similar or less risk. While growing new crops or raising animals may be technically possible, these may not be suitable for many farmers in terms of their land, labor and capital resources. Moreover, markets for the products may be lacking. The United Nations Food and Agriculture Organization (FAO) has been one of the development organizations promoting diversification by small farmers and has produced booklets identifying beekeeping, mushroom farming, milk production, fish ponds and sheep and goats, among others, as diversification possibilities.

3.1 The Opportunities include:

3.1.1 Changing consumer demand: As consumers in developing countries become richer, food consumption patterns change noticeably. People move away from a diet based on staples to one with a greater content of animal products (meat, eggs, and dairy) and fruits and vegetables. In turn, more dynamic farmers are able to diversify to meet these needs.

3.1.2 Changing demographics: Rapid urbanization in developing countries affects consumption patterns. Moreover, a smaller number of farmers, in percentage terms at least, has to supply a larger number of consumers. While this may not imply diversification it does require adaptation to new farming techniques to meet higher demand.

3.1.3 Export potential: Developing country farmers have had considerable success by diversifying into crops that can meet export market demand. While concern about food miles, as well as the cost of complying with supermarket certification requirements such as for Global GAP may jeopardize this success in the long run, there remains much potential to diversify to meet export markets.

3.1.4 Adding value: The pattern witnessed in the West, and now becoming widespread in developing countries, is for consumers to devote less and less time to food preparation. They increasingly require ready-prepared meals and labor-saving packaging, such as pre-cut salads. This provides the opportunity for farmers to diversify into value addition, particularly in countries where supermarkets play a major role in retailing.

3.1.5 Changing marketing opportunities: The changing of government policies that control the way in which farmers can link to markets can open up new diversification possibilities. For example, in India, policy changes

to remove the monopoly of state "regulated markets" to handle all transactions made it possible for farmers to establish direct contracts with buyers for new products.
3.1.6 Improving nutrition: Diversifying from the monoculture of traditional staples can have important nutritional benefits for farmers in developing countries.

3.2 In line of the above, the various Threats include:
3.2.1 Urbanization: This is both an opportunity and a threat, in that the expansion of cities places pressure on land resources and puts up the value of the land. If farmers are to remain on the land they need to generate greater income from that land than they could by growing basic staples. This fact, and the proximity of markets, explains why farmers close to urban areas tend to diversify into high-value crops.
3.2.2 Risk: Farmers face risk from bad weather and from fluctuating prices. Diversification is a logical response to both. For example, some crops are more drought-resistant than others, but may offer poorer economic returns. A diversified portfolio of products should ensure that farmers do not suffer complete ruin when the weather is bad. Similarly, diversification can manage price risk, on the assumption that not all products will suffer low prices at the same time. In fact, farmers often do the opposite of diversification by planting products that have a high price in one year, only to see the price collapse in the next, as explained by the cobweb theory.
3.2.3 External threats: Farmers who are dependent on exports run the risk that conditions will change in their markets, not because of a change in consumer demand but because of policy changes. A classic example is the Caribbean banana industry, which collapsed as a result of the removal of quota protection on EU markets, necessitating diversification by the region's farmers.
3.2.4 Domestic policy threats: Agricultural production is sometimes undertaken as a consequence of government subsidies, rather than because it is inherently profitable. The reduction or removal of those subsidies, whether direct or indirect, can have a major effect on farmers and provide a significant incentive for diversification or, in some cases, for returning to production of crops grown prior to the introduction of subsidies.
3.2.5 Climate change: The type of crop that can be grown is affected by changes in temperatures and the length of the growing season. Climate change could also modify the availability of water for production. Farmers in several countries, including Canada, India, Kenya, Mozambique and Sri Lanka have already initiated diversification as a response to climate change. Government policy in Kenya to promote crop diversification has included the removal of subsidies for some crops, encouraging land-use zoning and introducing differential land tax systems.

IV. Literature Review

Dholakia, (2010), workout Gujarat shows first time a statistically significant trend growth rate of 4.7percent per annum with considerably low extent of fluctuation compared to previous decade. The last decade (2000-01 to 2009-10) shows further improvement in both the trend growth rate as well as lower degree of fluctuations raising the statistical significance level of the estimates. Gujarat shows consistently accelerating economic growth in real GDP throughout the five decades. At a high growth rate of 8.1percent during the 1990s, the economy further achieved accelerating by 30 percent during the fifth decade of its independence.

Chand and Raju, (2009) traces instability in Agricultural and food production is very much important for food management and macroeconomic stability. There was a high risk involved in farm production; it affects farmer's income and decision in farming. Instability in area,reduction and yield of important crops and crop aggregates has been studied at national level as well as state level during different periods. These periods are clearly distinguishable in terms of major policy initiatives taken in the country and adoption of new agricultural technology. Further, the analysis is extended to disaggregate level using district level data for the state of Andhra Pradesh. As there are vast variations in agro climatic conditions across states and districts a disaggregate analysis reveals instability at micro level which is more relevant for producers and consumers.

Shinoj P. and V.C. Mathur, (2008), in their study report "Comparative Advantage of India in Agricultural Exports vis-à-vis Asia: A Post-Reform Analysis" has opined that exports of various agricultural commodities from India have responded differently in terms of comparative advantage during the post-reforms period. India has enjoyed a comparative advantage in tea exports but has depicted a declining trend over the years. However, Sri Lanka has shown a far better advantage in comparison to India and other countries like China and Indonesia. A similar pattern has been observed in coffee exports also, where India has been found losing its comparative advantage to other coffee exporters like Vietnam and Indonesia.

Pathak & Singh, (2007), worked out the performance of production and productivity of important crops/ crop

groups of the state have been analyzed using trends rates of growth (TRG) for the period from the advent of Green Revolution. As years 1968-69 and 1969- 70 seem to be not normal, the same were dropped from the analysis of CGRs. Further the agricultural growth during the time series period 1970- 2005 reveals distinct phases of development. Therefore, the series periods, viz., Green Revolution period of 1970 – 91, and the reform period of 1991- 2005 for the purpose of analysis. During the period of reform,compare to the earlier period of GR, higher and significant growth rates were observed in the productivity of Jowar, bajra, maize, all cereals, all food grains, groundnut and sesame.Sugarcane productivity showed a negative growth rate of (-) 1. 28 percent.

Mathur, Das, and Sircar (2006) discussed trends in growth of agricultural production in India over the last one and half decade. The study identifies factors that affect agricultural growth and analyses constrains that have affected its growth in the sector. There has been a decline in growth rate of the agriculture sector during the 1990 till the recent past. This is accompanied with recent decline in yields per hectare for a number of food crops. There are vast inter-state differences in growth rate of agriculture and even more so for food grains. The analysis at the all India level for the period 1990-91 to 2003-04 suggests that government expenditure in agriculture including public investment and subsidy for fertilizer usage and electricity consumption for agriculture are the main factors affecting agricultural production in India. At the same time, the state – wise analysis from the panel regression result shows that the agricultural output at current prices is significantly and positively dependent on government expenditure on agriculture, fertilizer usage, rainfall and population.

Malik, et al ,(2004), argued there has been a slow down in the growth rate of direct demand for food grains consumption on account of several factors. First the growth rate of population has decelerated to 2.16 percent per annum during 1991-2001 from 2.39 percent per annum during the earlier decade. Second, with rise in per capita income and changing tastes and preferences, the food basket is getting rapidly diversified. With such a diversification of consumption, the income elasticity of demand for food grains has declined perceptibly. The consumption patterns have been changing both in rural as well as in urban areas. The pattern of consumption of food grains over the years indicate a consistent fall in consumption of cereals both in rural as well as urban.

Srivastava,(2003),worked out compound growth rates of area, production and productivity of pulses in all the district of eastern Uttar Pradesh during 1975-76 to 1999-2000. The results revealed that area and production of pulses declined at the rate of 1.8 and 0.67 per cent per annum, but productivity increased at a compound growth rate of 1.18 per cent per year.

The Reserve Bank of India (RBI) observed in its 2001 Annual Report that "the pace ofprogress in liberalization of external trade in agriculture warrants a sense of urgency and priority to institutional reform in agriculture." (RBI: 2001). While stressing the importance of public investment in basic infrastructure the RBI stressed the importance of effective supply chain arrangements that encompassed storage, processing and trading. It also noted a major concern of regulating intermediaries. There is a strong perception that inadequate regulation of intermediaries in agricultural trade acutely affects farmers on account of low farm gate prices. Policy constraints such as restrictions on movement of agricultural commodities and *ad hoc ism* in export policy have been cited as a major source of regulatory problems(Government of Kerala: 2003).

C. H. Hanumantha Rao, (1995), states that prospects for agriculture in India are bright, there is considerable scope for raising farm income and employment by stepping up agro based exports, consolidating the food security already achieved. He further explains that the export potential of food grains will further strengthen food security at home, because exports can always be adjusted to ensure adequate availability of food grains for the domestic market.Apart from food grains horticultural products, floriculture, and agro-processing in general are likely to emerge as promising sectors.

Mahendradev, (1987), reported a progressive but marginal decline in instability in food grains production at all India levels were mixed results compare to state levels. Analyzed weather adjusted and unadjusted, growth rate in food grain output for all major states in the country.Based on the standard deviation in year to year change in output, the study concluded that there was a progressive but marginal decline in instability at all India level. At state level, there was decline in some cases and increase in some other states. Other important findings of this study relevant to the debate on instability were: after 1979-80 instability in food grain production at all India level dropped to 8.18 per cent but it showed only a marginal decline from11.41 during 1960-61 to 1969-70 to 11.16 during 1970-71 to 1979-80. Though the decline after 1979-80 refers to a very short period (1980-81 to 1984-85) but it indicates that the instability could turn out to be different after the initial years of adoption of

new technology. Second, as the conclusions of the study were different than the earlier studies the author felt these were due to differences in the selection of time periods.

V. Objectives

There are a number of studies that have looked at diversification of agriculture and the factors driving agricultural diversification.

The main objectives of the study are:

1. To study role of agricultural diversification-it's concept, rationale and approaches.
2. To demarcate the crop diversification regions and changes therein.
3. To Study Opportunities and threats
4. To highlight the factors responsible for changes in crop diversification regions.
5. To study issues, Problems and Prospects in Agricultural diversification.
6. To study trends in Agriculture Income Diversification.
7. To find out the impact of crop diversification on environment.
8. To make suggestions on changing trends on Agriculture Diversification.

VI. Emerging Issues, Problems And Prospects

In India, almost all small farms practice multi-diversified farming and grow a number of crops even on small acreage and fragmented plots. Many of them undertake crop and livestock farming in a symbiotic manner. But this kind of farming does not necessarily yield enough returns for the sustenance and upward movement of small farm families. Therefore, what is important for real diversification is that small farmers do not just grow a large number of less productive, subsistence crops and undertake traditional livestock farming. Instead, they should cultivate a few selected high yielding, high income generating and eco-friendly crops and livestock enterprises which fit well into the agro-climatic environment of each region. The data generated by the Agro-Climatic Regional Planning Unit of the Planning Commission reveal that there is immense possibility of diversified agricultural growth on small farms for which agricultural scientists, extension workers, administrators, planners, farmers' representatives and NGO's may have to work together to develop optimal farm and non-farm plans at the grass root level and synchronize them with regional and national level plans.

Nevertheless, while planning for small farm diversification, we confront a number of issues and problems:

Socio-Economic Constraints

Farmers, particularly small and marginal farmers do not have the ability to invest in crop and non-crop enterprises which require high investment of capital and labor inputs. They also find it difficult to spend time to learn about, undertake and assume risks of adopting any new agricultural economic activity, unless the relative economic gains from such activity have already been demonstrated elsewhere or unless the expected relative profitability from proposed diversification appears to be reasonably favorable in their perception. This is particularly true if the opportunity cost of proposed diversification is high. For instance, if the small farmers are asked to grow fruit trees like mango, lychee etc. which have long gestation period by replacing the existing seasonal crop enterprises, the opportunity cost of such proposed diversification could be highly prohibitive. In addition, crops which are of high value today like fruits and vegetables may not retain their relative superiority in value if all farmers of any given region start producing the same crops. This will lead to 'glut' in the market and dampen the price and income levels of farmers, unless the farmers have access to national and international markets in an organized manner. Knowing well this kind of market behavior, farmers will not be induced to diversify in favor of so-called high value crops. Besides, in many cases, markets and price information do not exist at all for some of the high value, perishable commodities which constrain the process of diversification most. There is often a dilemma whether market should be developed first before starting any diversification process or diversification should be initiated before market develops. This is like a 'chicken and egg' proposition. While the market entrepreneurs, (if it is to be in the private sector) would expect that newly introduced agricultural commodities become available in adequate quantity and quality for their newly developed market, the farmers would not produce beyond a point, unless the access to market for the new product is ensured. Whether the markets should be developed by the private market entrepreneurs or Government or farmers' co-operative societies is another point of debate. Various research findings indicate that private traders often exploit the producers of perishable agricultural commodities to the extent of total discouragement to the production of such crops. The positive role played by NDDB, dairy co-operatives and NAFED in procuring some of these products and in checking the exploitation of farmers by private traders, is well recognized. But space as well as commodity coverage by them remain highly insignificant to make any diversification possible in remote hinterlands.

Moreover, there is often a conflict between private economics and social economics of agricultural diversification. If the Government considers it necessary to promote the growth of certain agricultural commodities for national food security or for earning necessary foreign exchange, it may advise the farmers to shift in favor of such crops or enterprises. But unless the farmers find it relatively profitable to change to undertake the new enterprises, the Government would have to decide if it can subsidize the farmers to bridge the gap between private economics and social economics of diversification. In view of the growing attack on the very concept of subsidies in the wake of structural adjustment program, it is doubtful whether the Government would opt for subsidizing the farmers for diversification to a large extent.

Nevertheless, the crucial question is: can we provide minimum support prices to fruits and vegetable crops harvested by small and marginal farmers in different parts of the country, so that there is sufficient inducement to diversify in favor of these crops? Is it a feasible proposition in view of the highly perishable nature of these commodities? Moreover, as a matter of traditional practice, every farmer in India prefers to grow at least some minimum amount of food crops in his own field for self-consumption and this behavior is likely to continue unless he develops confidence that he will have access to reasonable food security without any uncertainty and inconvenience. How do we change such farm behavior which constrain the growth of commercial fanning?

Technological Constraints

Technological change holds the key to agricultural diversification. The present level of technological development for some of the high value fruits and vegetable crops is not only inadequate, but the available technology does not suit various agro-climatic situations. Moreover, the export led diversification would require technology for improving the quality of products, keeping in view the demands in domestic and international markets. There is need for development of not only appropriate farm production technology, but also processing and marketing technologies for all those crops which are being considered for future diversification. A number of micro level studies have pointed out that non-availability of good planting material and high incidence of pests and insects act as major constraints to the adoption of some high value crops. Besides, variability in the yield of some of the high value crops are very high which would act as a deterrent to diversification. Therefore, generation of appropriate technologies including low cost biotechnologies and their quick dissemination would be essential for diversified growth of smallholder agriculture.

The recent results of ICAR national demonstrations indicate that there is still a huge technological gap/yield gap in respect of important cereal crops in various regions of the" country. Bridging of such yield gaps for cereals crops may improve the prospect of non-cereal led diversification. India can even plan for competing with Thailand, Vietnam and USA for exporting surplus rice output to other countries, particularly if bridging of the existing yield gap reduces the cost of production per unit of output and makes the products competitive in the international markets. Agricultural research fund allocations in India are generally biased towards food and limited number of traditional export crops. The challenge of diversification demands far more concentrated research efforts for technology generation through scientific excellence and greater allocation of research funds in favor of high value crop and non-crop enterprises including fruits, vegetables, flowers, livestock, fisheries, agro-forestry, agro-processing, agri-business etc. Besides, substantial investment may be required in research on agricultural policy formulation and human resource development, involving the training of scientists, extension workers and farmer leaders on the need and planned methods for agricultural diversification in various agro-climatic regions. Technological potentials are reported to exist. But bridging of the technological gap through further research, training and extension efforts would be crucial for diversified growth of small holder agriculture. This is intended to improve the productivity and quality of high value crops and their competitiveness in the domestic and global markets.

Infrastructural Constraints

The Government financed infrastructures in the country are highly concentrated in certain developed regions. The small farms in backward regions do not have access to basic infrastructural facilities of road, transportation, linked market in the neighbourhood, cold-storage, irrigation and power which are so essential for both horizontal and vertical diversifications. The success of any agricultural diversification plan would depend largely on the availability of infrastructural facilities which would link the farmers with local, national and global markets. Even the institutional credit facilities are monopolized by a few relatively developed regions. How do we overcome this situation, particularly when the public investment in infrastructure development in rural areas is showing a declining trend and no private entrepreneurship is likely to emerge in the near future? Can we think of community action for infrastructure development involving the village Panchayat, Zila Parishad, farmer's associations, NGOs etc.? Is it not true that the present strategy of diversification based on existing unequal infrastructural facilities will further accentuate regional disparities in development?

INADEQUATE INSTITUTIONAL ARRANGEMENTS FOR DIVERSIFICATION

In a country like South Korea and Japan, the goal of diversification was successfully achieved primarily because of effective institutional arrangements at the grassroot level. A well-co-ordinated effort of agricultural co-operatives, local self-government and rural guidance offices made the diversification program in Korea a viable proposition. Can we think of some such institutional arrangements at the grassroot level which will provide the necessary credit, capital and marketing facilities? Can we revitalize our co-operative organizations for the purpose? Can the emerging Pancayat Raj system act as a catalyst? Can our Krishi Vigyan Kendras or extension workers be of some use? Alternatively, can private market entrepreneurship or a system of contract farming help promote diversification? What is our experience with the operations and functioning of agri-business consortium? These are some of the issues which must be discussed at great length to work out a viable institutional arrangement to cater to the needs of small farm diversification.

Physical Constraints

All types of lands and locations are not equally suitable for diversified, albeit profitable alternative farming. Moreover, in greater part of high rainfall and irrigated zones, heavy textured soil and poor drainage system stand in the way of diversification in favor of non-rice crops, unless land improvement and drainage measures are undertaken.

The question is whether efforts of state government, panchayat or collective action of the farmers would be forthcoming for such land improvement? Even in the dry areas, diversified farming would depend much on soil type, topography etc. Also fragmented plots of small holdings act as a constraint to efficient use of land for diversification, particularly because the farms get deprived of the necessary economies of scale. Therefore, consolidation of even smaller holdings along with provisions of joint farming could help promote diversification.

In the past, some states have not implemented consolidation of holdings on the pretext that this leads to eviction of tenants and small and marginal farmers. But this problem could be solved by protecting the land rights of each category of farmers.

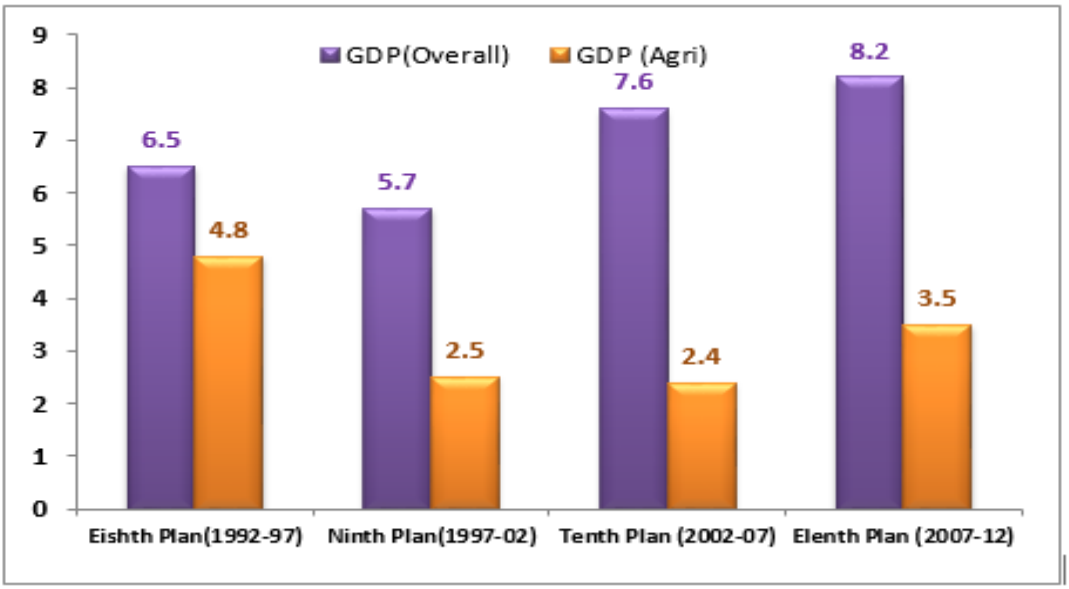
VII. Agriculture Income Diversification

The Aggregate Agricultural income (agriculture gross domestic product at factor cost, GDP at factor cost) as per the CSO annual series consists of income from crop outputs (field and plantation crops), livestock, fisheries and forestry. Again at the individual sub-sector level, income or GDP at factor cost is available separately for fisheries and the forestry sector; GDP at factor cost is not available separately for the crop and livestock sector. Agricultural GDP at factor cost is available from the combined outputs of crop and livestock. The contribution of agriculture in total GDP as is known widely is decreasing, and the share of industry and the service sector in the economy is increasing. The decline in the share of agricultural GDP has been rapid during the post-liberalization period; in spite of the fact that growth of agricultural income during the 1990s has been marginally higher than the corresponding rate of growth in the 1980s. Growth in agriculture has stagnated towards the end of the 1990s and decelerated thereafter. In this context, the composition of income from agriculture and allied sector of economy has been studied.

The Indian Agriculture sector is expected to show growth with better momentum in the next few years owing to increase in investment in agricultural infrastructure such as irrigation facilities, warehousing and cold storage. Agriculture as expected grew at 4.6 per cent in 2014.

India's economic security continues to be dependent upon the agriculture sector. In India, agriculture supports 58% of the population, as against about 75% at the time of independence. In the same period, the contribution of agriculture and allied sectors to the Gross Domestic Product (GDP) has fallen from 61 to 19%.

Figure 1
Indian Agriculture Growth Rate in GDP



The 12th Five Year Plan's estimates of expanding the storage capacity to 35 MT and the target of achieving an overall growth of 4 per cent will also go a long way in modifying the overall face of the Indian agriculture sector in the next few years.

Table -1

Share of Agriculture & Allied Sector in Total GSDP during 2008-09, 2009-10 and 2010-11 at Current Prices (2004-05 Base Year)

(Lakhs) ₹)

Sl. No.	State\UT	GSDP From Agriculture & Allied			% age Share of Agriculture & Allied in Total GSDP		% age Growth over Previous Yr	
		2008-09	2009-10	2010-11	2009-10	2010-11	2009-10	2010-11
1	2	3	4	5	6	7	8	9
1.	Andhra Pradesh	9865816	11187545	13756000	23.54	24.23	13.40	22.96
2.	Arunachal Pradesh	170985	180221	N.A	26.33	N.A	5.40	N.A
3.	Assam	2259154	2670708	3016345	28.88	28.94	18.22	12.94
4.	Bihar	4216771	4112676	4777770	23.47	22.42	-2.47	16.17
5.	Jharkhand	1459969	1510168	1596659	15.68	14.96	3.44	5.73
6.	Goa	152145	174852	N.A	6.76	N.A	14.92	N.A
7.	Gujarat	5779277	6751804	N.A	15.73	N.A	16.83	N.A
8.	Haryana	3888753	4235463	5077051	19.58	19.69	8.92	19.87
9.	Himachal Pradesh	824386	881296	1180128	20.36	22.51	6.90	33.91
10.	Jammu & Kashmir	942392	990788	1043455	22.92	21.87	5.14	5.32
11.	Karnataka	4920955	5998890	6873635	17.40	17.23	21.90	14.58
12.	Kerala	3013382	3263851	N.A	14.17	N.A	8.31	N.A
13.	Madhya Pradesh	4915712	5851963	N.A	26.97	N.A	19.05	N.A
14.	Chattisgarh	1727645	1954172	2172418	17.79	16.75	13.11	11.17
15.	Maharashtra	7600177	9180616	10755151	10.19	10.45	20.79	17.15
16.	Manipur	183583	206372	227835	24.82	24.77	12.41	10.40
17.	Meghalaya	223764	251181	279904	19.64	19.11	12.25	11.44
18.	Mizoram	94065	122602	N.A	21.76	N.A	30.34	N.A
19.	Nagaland	248027	N.A	N.A	N.A	N.A	N.A	N.A

20.	Orissa	3102171	3405489	3797896	20.98	20.38	9.78	11.52
21.	Punjab	5553885	5970086	6681383	30.60	30.19	7.49	11.91
22.	Rajasthan	5536227	5680207	7999497	22.25	26.37	2.60	40.83
23.	Sikkim	47029	53101	61282	11.20	10.84	12.91	15.41
24.	Tamil Nadu	4745807	6029808	6565831	12.73	12.00	27.06	8.89
25.	Tripura	283318	293999	305236	20.13	18.69	3.77	3.82
26.	Uttar Pradesh	12762002	14626827	15843772	28.19	26.92	14.61	8.32
27.	Uttarakhand	824221	979810	1075127	14.69	13.86	18.88	9.73
28.	West Bengal	7631668	9376792	N.A	23.50	N.A	22.87	N.A
29.	A & N islands	40489	48910	N.A	12.73	N.A	20.80	N.A
30.	Chandigarh	10436	10927	11010	0.62	0.53	4.70	0.76
31.	Delhi	131608	156475	159768	0.72	0.62	18.89	2.11
32.	Pondicherry	53715	56028	58981	4.94	4.56	4.31	5.27

Note:-Agriculture and Allied Sector includes Agriculture,Forestry & logging and Fishing.
Source: - Central Statistics Office, New Delhi.

Table -2
Depicting Total Population and Agricultural Workers

Year	Total Population	Average Annual Exponential Growth Rate (%)	Rural Population	Agricultural Workers		Total
				Cultivators	Agricultural Labourers	
1	2	3	4	5	6	7
1951	361.1	1.25	298.6 (82.7)	69.9 (71.9)	27.3 (28.1)	97.2
1961	439.2	1.96	360.3 (82.0)	99.6 (76.0)	31.5 (24.0)	131.1
1971	548.2	2.20	439.0 (80.1)	78.2 (62.2)	47.5 (37.8)	125.7
1981	683.3	2.22	523.9 (76.7)	92.5 (62.5)	55.5 (37.5)	148.0
1991	846.4	2.16	628.9 (74.3	110.7 (59.7)	74.6 (40.3)	185.3
2001	1028.7	1.97	742.6 (72.2)	127.3 (54.4)	106.8 (45.6)	234.1
2011	1200.2	1.64	833.1 (68.8)	N.A.	N.A.	N.A.

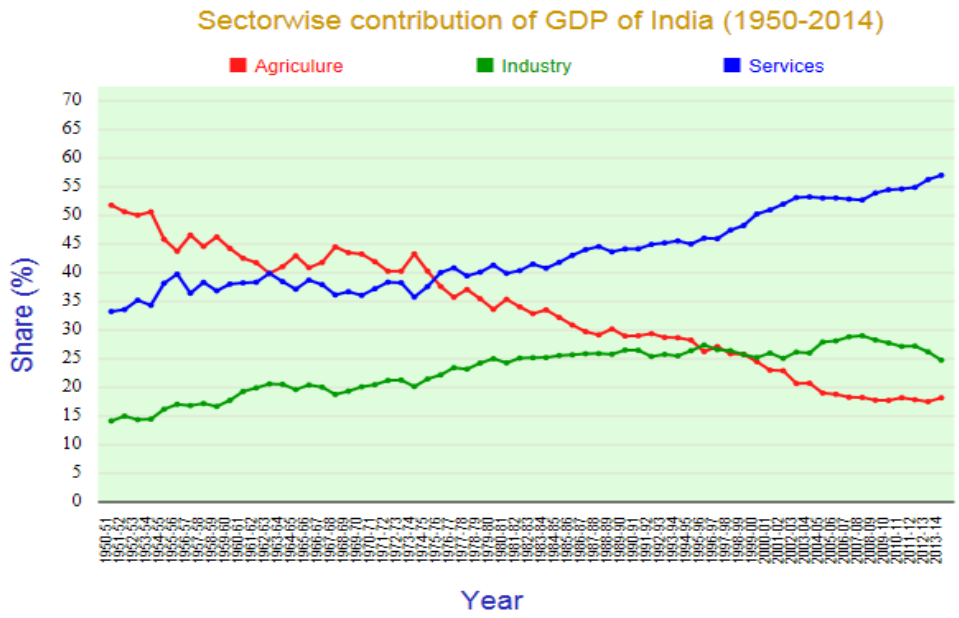
Notes:

1. For 2001, figures include estimated figures for those of the three sub-divisions viz. Mao Maram, Paomata and Purul of Senapati district of Manipur as census results of 2001 Census in these three sub-divisions were cancelled due to technical and administrative reasons.
2. The 1991 Census could not be held owing to disturbed conditions prevailing in Jammu & Kashmir. Hence the population figures for 1991 of Jammu & Kashmir have been worked out by 'interpolation'. The data on workers in columns 5-7 exclude J&K.
3. The 1981 census could not be held in Assam. The figures for 1981 for Assam have been worked out by interpolation.
   The data on workers in col. 5-7 exclude Assam.
4. Figures within parentheses in column 4 are percentages to the total population.
5. Figures within parentheses in columns 5 and 6 are percentages to column 7.

* Provisional
Source: Registrar General of India.

VIII. Sector –Wise Contribution Of Gdp Of India

Indian economy is classified in three sectors — Agriculture and allied, Industry and Services. Agriculture sector includes Agriculture (Agriculture proper & Livestock), Forestry & Logging, Fishing and related activities. Industry includes Manufacturing (Registered & Unregistered), Electricity, Gas, Water supply, and Construction. Services sector includes Trade, repair, hotels and restaurants, Transport, storage, communication & services related to broadcasting, Financial, real estate services, Community, social & personal Services.



With trade liberalization, the relative prices of exportable commodities have increased and that of importable commodities have decreased. In the short run (3-4 years), a continuous increase in the relative price of a commodity increases its production more often by substituting it for importable commodities without any significant effect on the cropped area. As a result, the shares of exportable commodities have increased in the total value of agricultural output.

IX. Conclusions And Recommendations

9.1Need for Vertical Diversification

One common feature of small farm diversification is that diversification plan of small farms invariably includes adequate development of non-farm activities. In India also agricultural sector can hardly afford to sustain all its growing population and therefore, vertical diversification of small farms is all the more important. Small farms have to be basically part time farmers. But the investment and organisational requirements of such vertical diversification in the form of agro-industry, agri-business, agro-processing and services would be even greater. Also the role of Government, Private sector, Co-operative and NGOs in this regard need to be properly defined.

9.2 Need for Policy Support

The traditional agricultural development policies in India have not been favorable to diversified agricultural growth, particularly in the context of small farms and backward regions. Therefore, if our objective is to promote small farm diversification in various agro-climatic regions of the country, the existing policies may have to be partly modified. First, the agricultural price policy does not provide adequate protection in terms of procurement and minimum support prices to fruits and vegetable crops. Since the production and prices of these commodities fluctuate widely, small farmers would find it difficult to grow these crops, unless price protection is available.

Secondly, small farmers, particularly in backward regions do not have access to cold storage, market and transportation facilities. Similarly, in the absence of stable power supply, the promotion of non-farm activities like agro-processing would be unthinkable. Primarily, it should be the responsibility of the Government to develop these infrastructural facilities, although willing private entrepreneurs could also be involved.

Thirdly, tenancy laws of most of the states may have to be modified to allow the large farmers to take

up non-farm activities and to enable the marginal and small farmers to have greater access to land through lease market. This would enhance their economic viability and also promote diversified agricultural growth. 'Similarly, consolidation of holdings of even smaller holdings would enable them to enjoy better economies of scale.

Fourthly, technology generation policy would need greater support in terms of investment in research, extension and training in favor of those crops and enterprises which are being considered for diversification.
Fifthly, in view of high variability of production, prices and income, the possibility of crop insurance coverage for some agricultural commodities which are perishable but of great social value due to their nutritional potentials and foreign exchange earning capacity may be considered.

Finally, the future direction of small farm diversification in India would largely depend on the direction and effectiveness of government policy that could influence the creation of appropriate socio-economic environment for diversified farming through necessary technological, infrastructural, institutional and administrative changes. The latest available data show that still about 66 per cent of the country's labour force is engaged in agriculture and share only 32 percent of GDP. Conversely, 34 percent of the labor force being in the non-agricultural sectorshare about 68 percent of GDP. Such glaring income disparities between agricultural and non-agricultural households must be removed through appropriate policy changes for horizontal as well as vertical diversification in rural areas. Indeed, the prospects of small farm diversification in India are quite high. What is needed is a real commitment on the part of our policy makers, administrators, scientists and extension workers to make small farm diversification a feasible and viable proposition.

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