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AGRICULTURAL DIVERSIFICATION IN INDIA

Hrideshwer Gupta*

Abstract: *Agriculture has always been the backbone of the Indian Economy and despite concerted industrialization in the last six decades; agriculture still occupies a place of pride. It provides employment to around 60 percent of the total workforce in the country. The significance of agriculture in India arises also from the fact that the development in agriculture is an essential condition for the development of the national economy. Agriculture sector is the principal source of food for consumption by non-agricultural workers.*

The Objective of the study is to know the diversification of Indian agriculture, Growth performance of major crops at national level, Area, production and productivity of major crops, Production and availability of various types of seeds, Agricultural Trade and Export scenario, Mechanization and technology uses; Agriculture holding condition; Change in Cropping Pattern; Horticulture Scenario (Area, Production and Productivity) in Indian Agriculture. We use secondary data for the study available from various sources.

Keywords: *Growth, Diversification, Cropping Pattern.*

*ICSSR Doctoral Fellow, Research Scholar, School of Studies in Economics, Vikram University, Ujjain (M.P.)

INTRODUCTION:

The Indian Economy has undergone structural changes overtime with the anticipated decline in the share of agriculture in GDP, despite a fall in its share from 55.1 percent in 1950-51 to 13.7 in 2012-13. The agriculture has not diminished for two major reasons; first, the country achieved self-sufficiency in food production at the macro level but still is a food deficit country facing massive challenges of high prevalence of malnourished children and high incidence of rural poverty. The pressure on agriculture to produce more and raise farmer's income is high; second, the dependence of the rural workforce on agriculture for employment has not declined in proportion to the sectoral contribution to GDP. This has resulted in widening the income disparity between the agricultural and non-agricultural sectors.

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The cropping pattern in India has undergone significant changes overtime. As the cultivated area remains more or less constants, the increased demand for food because of increase in population and urbanization puts agricultural land under stress resulting in crop intensification and substitution of food crops with commercial crops.

India's total geographical area is 328.7 MH, of which the net sown area is 140.0 MH. The gross cropped area is 192.2 MH and thus the cropping intensity works out to 137.3 percent. The net irrigated area is 63.3 MH as per land use statistics 2009-10. Agriculture sector shows diversification in India. The paper shows agricultural trend in last few years. Agriculture sector is a key factor for Indian Economy.

AGRICULTURE GDP TREND:

Advanced estimates of national income 2012-13 shows that agriculture and allied sector contributed 13.7 percent of India's GDP. Gross Domestic Product (GDP) of agriculture and allied sector and its share in total GDP of the country during the last 3 years and the current year at 2004-05 prices, is as follows:

(Rs. In Crore)

Item	Year			
	2009-10	2010-11	2011-12	2012-13
GDP of Agriculture and Allied Sectors	660987	713477	739495	752746
% of total GDP	14.6	14.5	14.1	13.7

Table shows that, there has been a continuous decline in the share of agriculture and allied sector in the GDP from 14.6 percent in 2009-10 to 13.7 percent in 2012-13 at 2004-05 prices. Falling share of agriculture and allied sector in GDP is an expected outcome in a fast growing and structurally changing economy.

Growth (over the previous year) in the total GDP and that in the GDP of agriculture and allied sector at 2004-05 prices is given below:

(In %)

Period	Growth in total GDP	Growth in Agriculture & Allied Sector
2007-08	9.3	5.8
2008-09	6.7	0.1
2009-10	8.6	0.8
2010-11	9.3	7.9
2011-12	6.2	3.6
2012-13	5.0	1.8

Source: Annual Report 2012-13, DAC,

The sector witnessed a growth of 5.8 percent in 2007-08, 0.1 percent in 2008-09, 0.8 percent in 2009-10, 7.9 percent in 2010-11 and 3.6 percent in 2011-12 at 2004-05 prices. Thus the average annual growth witnessed in agriculture and allied sector during the 11th plan (2007-08 to 2011-12) is 3.6 percent. Growth of 1.8 percent is seen in 2012-13.

GROWTH PERFORMANCE OF MAJOR CROPS:

Growth in area was the major source of production growth until early 1960s. The high yielding varieties introduced in wheat and rice during the late sixties heralded India's Green revolution. Along with technology, new institutional structure enabled the farmers to adopt improved methods of cultivation. The major changes included provision of better irrigation facilities, government procurement system, guaranteed support price and input subsidies plays important role in growth performance of crops. We shows growth performance in area, production and Productivity of Major crops in below table for last three years from 2009-10 to 2011-12.

Area, Production and Productivity of Major Crops

Crops	Area (Lakh Hectares)			Production (MillionTonnes)			Productivity (Kg/Ha)		
	2009 - 2010	2010 - 2011	2011 - 2012	2009 - 2010	2010 - 2011	2011 - 2012	2009 - 2010	2010 - 2011	2011 - 2012
Rice	419.18	428.62	440.06	89.09	95.98	105.31	2125	2239	2393
Wheat	284.57	290.69	298.64	80.80	86.87	94.88	2839	2989	3177
CoarseCereals	276.75	283.39	264.22	33.55	43.40	42.04	1212	1531	1591
Pulses	232.82	264.02	244.62	14.66	18.24	17.09	630	691	699
Food-grains	1213.34	1266.71	1247.55	218.11	244.49	259.32	1798	1930	2079
Oil-seeds	259.59	272.24	263.08	24.88	32.48	29.80	958	1193	1133
Sugar cane	41.75	48.85	50.38	292.30	342.38	361.04	70020	70091	71668
Cotton*	101.32	112.35	121.78	24.02	33.00	35.20	403	499	491

* Production in million bales of 170 kg each.

Source: www.agricoop.nic.in

The table shows trend in area, production and productivity of major crops i.e. Rice, Wheat, Coarse Cereals, Pulses, Food grains, Oilseeds, Sugarcane and Cotton.

SEEDS:

Seeds are the basic and critical input for agricultural production. The Indian seeds programme recognizes three generations of Seeds, namely; breeder, foundation and certified seeds. The details of production of breeder and foundation seeds as well as production of certified seeds during the years 2005-06 to 2011-12 are given below;

Production of Breeder, Foundation and Certified/Quality seeds

Year	Production/Availability of Seed (Metric Tonnes)					
	Breeder Seed	Growth %	Foundation Seed	Growth %	Certified/ Quality Seed	Growth %
2005-06	6865	-	74000	-	1405000	-
2006-07	7382	7.53	79654	7.64	1481800	5.47
2007-08	9196	24.57	85254	7.03	1943100	31.13
2008-09	9441	2.66	96274	12.93	2503500	28.84
2009-10	10604	12.32	180817	87.82	2797200	11.73
2010-11	11921	12.42	180640	-0.09	3213592	14.88
2011-12	12727	6.76	222681	23.27	3536200	10.03

Source: Annual Report 2012-13, DAC,

Breeder seeds witnessed a growth of 7.53 percent in 2006-07, 24.57 percent in 2007-08, 2.66 percent in 2008-09, 12.32 percent in 2009-10, 12.42 percent in 2010-11, 6.76 percent in 2011-12. Foundation seeds witnessed a growth of 7.64 percent in 2006-07, 7.03 percent in 2007-08, 12.93 percent in 2008-09, 87.82 percent in 2009-10, -0.09 percent in 2010-11, 23.27 percent in 2011-12. Certified / Quality seeds witnessed a growth of 5.47 percent in 2006-07, 31.13 percent in 2007-08, 28.84 percent in 2008-09, 11.73 percent in 2009-10, 14.88 percent in 2010-11, 10.03 percent in 2011-12. Overall study shows that only Foundation seeds show negative growth of 0.09 percent in a single calendar year in 2010-11.

FERTILIZERS, ORGANIC FARMING AND PLANT PROTECTION:

Average estimated consumption of fertilizers (N+P+K) in the country has registered a decrease in 2011-12 over 2010-11 from 146.32 kg/ha to 144.33 kg/ha. A great deal of variability has however been observed in fertilizer consumption among states, while per hectare consumption of fertilizers is 243.56 kg in Punjab and 266.11 kg in Andhra Pradesh. It is comparatively low in Himachal Pradesh (55.18 Kg/ha), Odisha (56.52 Kg/ha), Rajasthan (62.35 Kg/ha), and Madhya Pradesh (88.36 Kg/ha). It was below 5 Kg/ha in some of the North Eastern states.

Organic Farming is farming in harmony with nature respecting natural cycle, natural land fertility, animal welfare, landscape features and rural development. Organic farming is the process of producing food naturally. This method avoids the use of synthetic chemical fertilizers and pesticides and genetically modified organisms to influence the growth of crops. The main idea behind organic farming is to have zero impact on the environment. The aim of the organic farmer is to protect the earth's resources (land, water and plants) and produce safe, healthy food. Organic farming uses the earth's natural resources for sustainability. Organic farmer do not use pesticides, herbicides, genetically modified foods, growth promoters or hormones.

Plant protection strategy and activities have significant importance in the overall crop production programmes for sustainable agriculture. Plant protection activities encompass plant quarantine, regulation of pesticides, activities aimed at minimizing crop losses due to pests including locust control in desert areas and training and capacity building in plant protection.

AGRICULTURAL TRADE:

Trade in agricultural goods can play a significant role in promoting economic development. India is among the 15 leading exporters of agricultural products in the world. India's agricultural export have share of 2.1 percent of world trade in agriculture in 2011.

Agricultural exports increased from Rs. 120000 crore in 2010-11 to Rs. 187000 crore in 2011-12 registering a growth of nearly 55 percent. The share of agricultural exports in total exports increased from 10.47 percent in 2010-11 to 12.81 in 2011-12. India's top 10 agricultural export commodities in terms of quantity and value for the year 2009-10, 2010-11 and 2011-12 are given in table below;

Agricultural Export

Qty '000 tonnes; Value: Rs. In Crore

S. No.	Item	2009-10		2010-11		2011-12	
		Qty.	Value	Qty.	Value	Qty.	Value
1	Cotton Raw incl. Waste	1358	9537	1258	12981	2013	21623
2	Marine Products	710	9999	801	11548	1032	16588
3	Guar Gum Meal	218	1133	403	2806	707	16357
4	Rice Basmati	2017	10890	2186	10582	3212	15450
5	Meat & Preparations	-	6286	-	8776	-	14111
6	Spices	663	6157	749	7870	931	13176
7	Oil Meals	4671	7832	6798	10846	7436	11762
8	Sugar	45	110	3241	10339	2747	8779
9	Rice (Other than Basmati)	140	365	96	220	4099	8668
10	Other Cereals	2892	2973	3188	3596	4072	5479

Source: Annual Report 2012-13, DAC,

Table shows that agricultural export commodities; Cotton raw incl. waste, Sugar, Rice (other than Basmati) has variations in Qty. year wise but agricultural export commodities; Marine Products, Guar Gum Meal, Rice Basmati, Meat and Preparations, Spices, Oil Meals and Other cereals have increased Qty. every year. Value of agricultural export commodity; Rice Basmati, Sugar and Rice (Other than Basmati) have variations in export value. Other main agricultural export commodity except these are shows continuous growth in value.

MECHANIZATION AND TECHNOLOGY

For enhancing production and productivity, as well as for reducing the cost of production, the induction of improved/new technology in the agricultural production system is

inescapable. The level of mechanization has been increasing steadily over the years because of the joint efforts made by the Government and the private sector. The total farm power availability is estimated to have increased from 0.295 kw/ha in 1971-72 to 1.71 kw/ha in 2010-11. This is evident from the sale of tractors and power tillers, taken as indicators of the adoption of mechanized means of farming, during the last eight years, as given in Table below:

Sale of Tractors and Power Tillers

Year	Tractors Sold (Nos)	Growth %	Power Tillers Sold (Nos)	Growth %
2004-05	247531	-	17481	-
2005-06	296080	19.61	22303	27.58
2006-07	352835	19.17	24791	11.15
2007-08	346501	-1.79	26135	5.42
2008-09	342836	-1.05	35294	35.04
2009-10	393836	14.87	38794	9.91
2010-11	545109	38.41	55000	41.77
2011-12	535210	1.81	60000	9.09

Source: Annual Report 2012-13, DAC,

Table shows that there is continuous growth in sale of Tractors from 2004-05 to 2011-12 except Negative growth of -1.79 percent in 2007-08 and -1.05 percent in 2008-09. Power Tillers shows continuous growth from 2004-05 to 2011-12 but growth rate is less in year 2007-08 at 5.42 percent, 9.91 percent in 2009-10 and 9.09 percent in 2011-12.

AGRICULTURE HOLDINGS:

Total no. of operational holdings in the country increased by 6.61 percent from 129 million in 2005-06 to 138 million in 2010-11; the average size of operational holding declined to 1.16 ha in 2010-11 as compared to 1.23 ha in 2005-06.

Small and marginal holdings taken together (below 2 ha) constitutes 84.97 percent of the total holdings in 2010-11 against 83.29 percent in 2005-06.

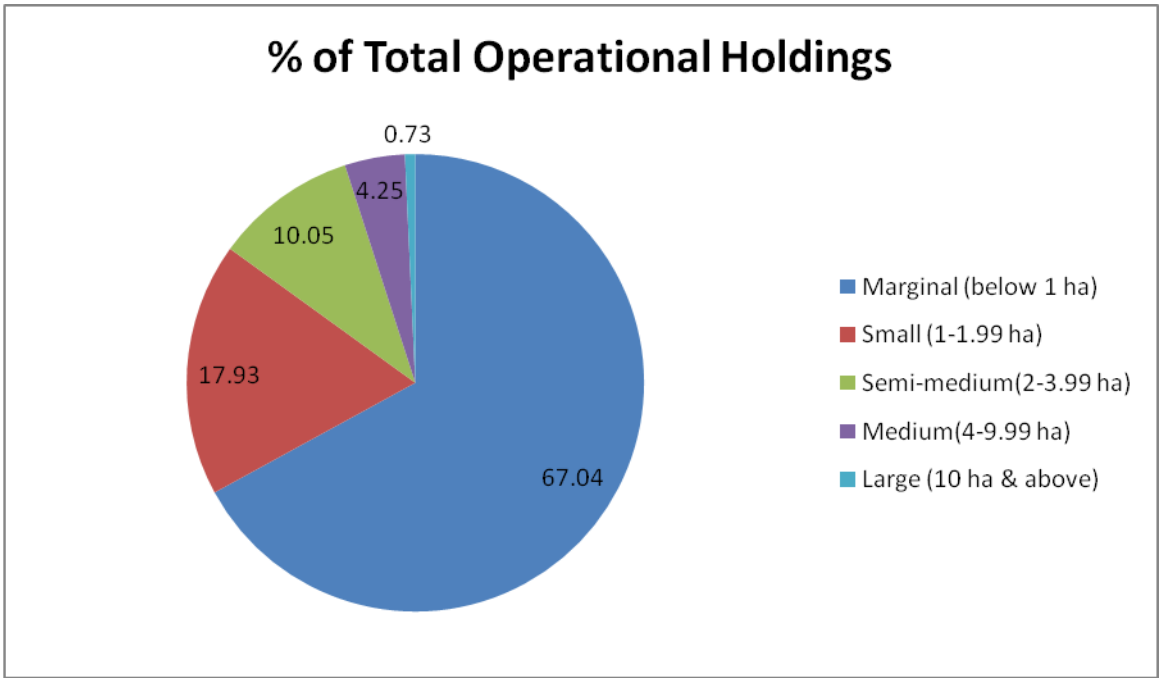
Semi medium and medium operational holdings (2 ha – 10 ha) in 2010-11 were 14.30 percent of the total holdings with an operated area of 44.77 percent of the total operated area. The corresponding figures for agricultural census 2005-06 were 15.86 percent and 47.05 percent.

Large holdings (10 ha & above) in 2010-11 constitute 0.73 percent of total no. of holdings with a share of 10.92 percent in the total operated area as against 0.85 percent and 11.82 percent, resp. in agriculture census 2005-06.

Operational Holdings

Sr. No.	Size Group	Operational Holdings	% of Total Operational Holdings
1	Marginal (below 1 ha)	92356	67.04
2	Small (1-1.99 ha)	24705	17.93
3	Semi-medium(2-3.99 ha)	13840	10.05
4	Medium(4-9.99 ha)	5856	4.25
5	Large (10 ha & above)	1000	0.73
	All Size Groups	**137757**	**100**

Source:www.agricoop.nic.in



It is clear that Marginal holding have 67.04 percent share, small holding 17.93 perecnt, semimedium holding 10.05 perecnt, medium holding 4.25 percent and large holding have only 0.73 percent of total holding.

CROPPING PATTERN CHANGE:

The horticulture basket comprises of fruits, vegetables, root and tuber crops, flowers, aromatic and medicinal crops, spices and plantation crops. Due to its vast diversity, horticulture facilitates diversification in agriculture. Horticulture crops covered an area of

23.2 million ha in 2011-12 as compared to 20.2 mha in 2007-08 thereby by registering an increase of about 15 percent. However the production which is 257.2 million MT in 2011-12, increased by about 22 percent during the period 2007-08 to 2011-12. The significant feature is that there has been improvement of productivity og horticulture crops, which increased by about 6 percent between 2007-08 and 2011-12.

Area, Production and Productivity of Horticulture Crops

Year	Area (Mha)	Growth %	Production(MMT)	Growth %	Productivity (MT/ha)	Growth %
2007-08	20.2	-	211.2	-	10.46	-
2008-09	20.6	1.98	214.7	1.65	10.42	-0.38
2009-10	20.8	0.97	223.0	3.86	10.72	2.87
2010-11	21.8	4.80	240.5	7.84	11.00	2.61
2011-12	23.2	6.42	257.2	6.94	11.08	0.72

Source:www.nhb.gov.in

Area, Production and Productivity Trend of Horticulture Crops

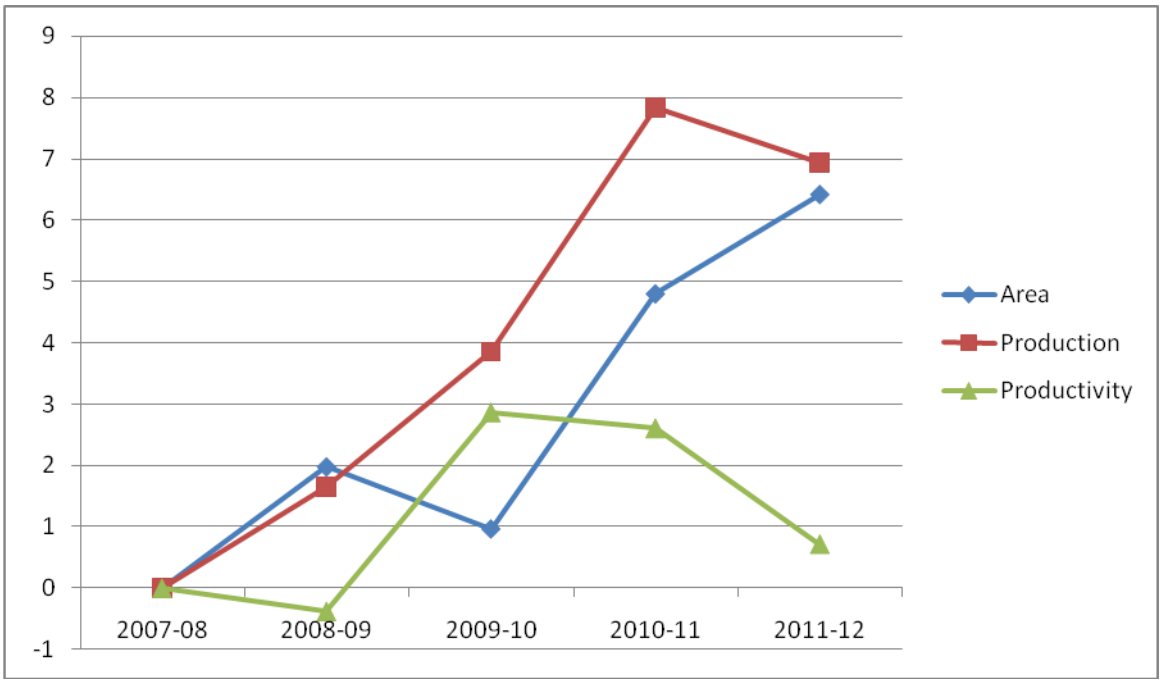


Table shows positive continuous growth in area of horticulture crops from 2007-08 to 2011-12. Production shows continuous positive growth from 2007-08 to 2011-12 but productivity shows negative growth rate of -0.38 percent in 2008-09 and positive growth rate from 2009-10 to 2011-12.

India is the second largest producer of fruits in the world and holds first position in production of fruits like mango, banana, sapota, pomegranate and aonla. The area under fruit crops during 2011-12 was 6.7 m. ha with a total production of 76.4 m. MT. Vegetables are an important segment in horticulture sector, occupying an area of 9.0 million ha during 2011-12 with a total production of 156.3 million tonnes and having average productivity of 17.4 tonnes/ ha. In fact vegetables constitute about 60% of horticulture production. India is the second largest producer of vegetables after China and is a leader in production of vegetables like peas and okra. Besides, India occupies the second position in production of brinjal, cabbage, cauliflower and onion and third in potato and tomato in the world. Vegetables such as potato, tomato, okra and cucurbits are produced abundantly in the country.

CONCLUSION:

The Growth of agriculture and allied sectors is still a critical factor in the overall performance of the Indian Economy. In year 2007-08, the agriculture sector had achieved an impressive growth of 5.8 percent. However; this high growth could not be maintained in the following two years and agriculture sector fell into the negative zone of -0.1 percent in 2008-09, although this was a year of a record 234.47 million tones food production. The decline in growth of agricultural GDP was primarily due to the fall in the production of agricultural crops such as oilseeds, cotton, Jute and Mesta and sugarcane. In 2009-10, despite experiencing the worst south-west monsoon since 1972 and subsequent significant fall in Kharif foodgrain production, the growth marginally recovered to 0.4 percent primarily due to a good rabi crop.

Agriculture provides employment to around 60 percent of the total workforce in the country. The significance of agriculture in India arises also from the fact that the development in agriculture is an essential condition for the development of the national economy.

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