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An Analysis of Crop Diversification in India

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Abstract

Agriculture plays an important role in India's economy where more than half of the rural population are involved in agriculture and allied activities as their principal means of livelihood. Indian agriculture had experienced radical changes after the introduction of New Agricultural Technology during mid-sixties and it has undergone several transformative changes thereafter. It has been observed that since 1990s there is an increasing trend of diversification in Indian agriculture. Crop diversification is one of the strategies in agricultural diversification that the farmers have adopted in order to reduce their vulnerability to face the risk and challenges involved in agriculture and also to increase their farm income. Agriculture in India has been diversifying in favour of more remunerative and high-valued crops due to the change in consumption basket of the economy. This paper tries to analyze the diversification of crops in agriculture sector of the economy. It covers the share of Gross Domestic Product in agriculture, changing pattern of land holdings, average holding size, changes in cropping pattern and the diversification towards horticulture sector. This analysis has found that the contribution of agriculture to India's GDP has been continuously falling along with decline in total agricultural workers in the economy. The agriculture sector is dominated by 67% of marginal farm holdings. Percentage share of Gross cropped area has shifted from food crops to non-food crops and the crop production have mainly diversified towards horticulture sector mostly in favour of fruits and vegetables.

Keywords: Agricultural, land holdings, cropping pattern, crop diversification, horticulture

Introduction

India is a country of about one billion people where agriculture plays an important role in India's economy. Over 58% of the rural households are involved in agriculture and allied activities as their principal means of livelihood. Agriculture, along with the fisheries and forestry, is one of the largest contributors to the country's Gross Domestic Product. Agriculture in India had experienced radical changes after the introduction of New Agricultural Technology during mid-sixties. The Indian agriculture as a whole has undergone several transformative changes. Continuous growing population, changing lifestyles, expanding urbanization and accelerating climate changes are creating new challenges for national agricultural research and development for the nation. The introduction of hybrid seeds of wheat and rice, responsible for the green revolution since 1967 helped boost the economy. Transfer of area to wheat and rice crops mainly from the coarse cereals and pulses was experienced in the early phases of the green revolution period. The food grain production increased from 50.83 million tonnes in 1950-1951 to a record figure of 275.68 million tonnes in the year 2016-2017. The area under rice and wheat which was 30.81 and 9.75 million ha in 1950-1951 had gone up to 43.19 and 30.59 million ha in 2016-17, respectively.

The term 'diversification' has been derived from the word 'diverge' which means to move or extend in the direction different from a common point (Jha, 1996). Agricultural diversification can be described in terms of the shift from the regional dominance of one crop towards the production of a large number of crops to meet the increasing demand of those crops. It can also be described as the economic development of non-agricultural activities (Minot, et al., 2006). Indian agriculture has been diversifying in favour of more remunerative and high-valued crops and also the livestock products in accordance with the changes in consumption pattern of the nation in favour of livestock's, fruits and vegetables. The data or

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The production strategy has been changing along with the basic commitment of ensuring food security. Crop diversification (horizontal and vertical) has been recognized as an effective strategy for achieving the objective of food security, nutrition security, income

growth, poverty alleviation, employment generation, judicious use of land and water resources, sustainable agricultural development and environmental improvement (FAO, 2001; Singh, 2001).

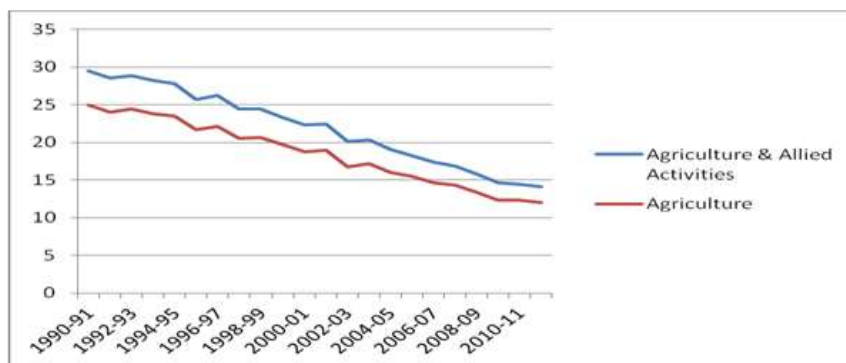


Fig. 1: Percent share of Agriculture in India's GDP at 2004-05 prices
Source: www.data.gov.in, Govt. of India

Fig.1 indicates the percentage share of agriculture and allied activities and also the percentage share of agriculture alone to the total gross domestic product of Indian agriculture (GDP at factor cost). The GDP undertaken is

calculated at the constant price of 2004-05. The line graph clearly represents the falling share of agriculture to total GDP of the economy since the starting year of the data under study, i.e. 1990-91 to 2010-2011.

Table.1: Population and Agricultural Workers
In Millions

Year	Total Population	Rural Population	Total Workers	Agricultural Workers	Cultivators	Agricultural Total Labourers
1991	846.4	630.6(74.5)	314.1	110.7(59.7)	74.6(40.3)	185.3(59.0)
2001	1028.7	742.6(72.2)	402.2	127.3(54.4)	106.8(45.6)	234.1(58.2)
2011	1210.8	833.7(68.9)	481.9	118.8(45.1)	144.3(54.9)	263.1(54.6)

Source: Agricultural Statistics at a glance.

*Numbers in parentheses represents the percentage terms.

Although the agriculture share in GDP has declined to a large extent, the workers in agriculture has not fallen much. Though the total number of workers in the economy is increasing over the decades from 314.1 millions in 1991 to 402.2 millions in 2001 and further to 481.9 millions in 2011, but the relative share of the agricultural workers to the total workers shows a gradual decline. The percentage share of agricultural workers to the total workers has decreased from 59% in 1991 to 58.2% in 2001 and then to 54.6% in 2011. This shows that more than half of the total population is still dependent on agriculture and so the agriculture remains the backbone of the Indian economy.

Pattern of Land Holdings in India

An operational holding of agricultural land in India is defined as "all land, which is used wholly or partly for agricultural production and is operated as one technical unit by one person alone or with others without regard to title, legal form, size or location" (MOSPI- Ministry Of Statistics and Programme Implementation). However the

concept of agricultural land holdings does not include those holdings which are not operating any agricultural land and also the land holdings which are exclusively for livestock, fishing and poultry, etc. The operational land holdings in India are classified under five categories on the basis of operated area under the farmers, as shown in the table:

Table.2: Types of operational land holdings in India

Sl. no.	Category of holdings	Operated Area
1	Marginal Holdings	Below 1.00 hectares
2	Small holdings	1.00 - 2.00 hectares
3	Semi-Medium holdings	2.00 – 4.00 hectares
4	Medium holdings	4.00 – 10.00 hectares
5	Large holdings	10.00 hectares and above

On the basis of these marginal holdings in Indian agriculture, changes in area and the number of operational holdings by different size groups have been analyzed by adopting the data from Agriculture Censuses from 1990-91 to the recent agriculture census of 2010-11.

Table.3: Number and Area of Operational Holdings by Farmer's Size Group (In Percentage)

Size Groups	Year (As per Agricultural Censuses)				
	1990-91	1995-96	2000-01	2005-06	2010-11
Number of Holdings:					
Marginal	59.4	61.6	63.0	64.8	67.0
Small	18.8	18.7	18.9	18.5	17.9

Semi-Medium	13.1	12.3	11.7	10.9	10.0
Medium	7.1	6.1	5.4	4.9	4.3
Large	1.6	1.2	1.0	0.8	0.7
Total	100	100	100	100	100
Area Of Holdings:					
Marginal	15.1	17.2	18.8	20.2	22.5
Small	17.4	18.8	20.2	20.9	22.1
Semi- Medium	23.2	23.8	24.0	23.9	23.6
Medium	27.0	25.3	23.8	23.1	21.2
Large	17.3	14.8	13.2	11.8	10.6
Total	100	100	100	100	100

Source: Ministry of Agriculture, Govt. of India.

According to the recent agriculture census (2010-11), the total number of operational holdings in India was estimated as 138.35 million hectares. The above table illustrates the number and area of holdings by different size groups of the farmers, calculated in percentage terms. It indicates that the number and area of marginal holdings in India in consistently increasing since 1990-91, where percentage of marginal holdings has increased from 59.4% in 1990-91 to 61.6 in the year 1995-96 census. It further increased from 63.0 (2000-01) and 64.8 (2005-06) percent to 67.1 % during the census 2010-11. Along with this, the percentage area of marginal holdings also heightened from 15.1% in 1990-91 to 17.2 in 1995-96, to 18.8 in 2000-01, to 20.2 during 2005-06 and further to 22.5 % in 2010-11. The small holdings in these different agricultural census

illustrates that though there is both rise and fall in their number of holdings, but the area of small holdings has gradually escalated from 17.4% in 1990-91 to 18.8 in 1995-96, to 20.2 in 2000-01 and to 20.9 in 2005-06 and then again rose to 22.1 percent in 2010-11. Whereas, the number and area of semi medium and medium holdings has also been continuously declining since decades. Focusing on the large holdings of Indian agriculture, it has been observed that the number of holdings decreased from 1.6 percent in 1990-91 to 1.2 in 1995-96, to 1.0 in 2000-01 to further 0.8 in 2005-06 and then again reduced to 0.7 percent in 2010-11. Besides, the percentage area of large holdings has also marked the continuous fall during these census since 1990-91. Thus, this table portrays that the Indian agriculture is dominated by the marginal holdings.

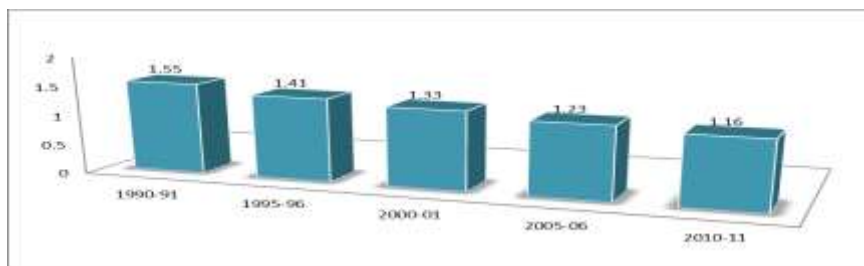


Fig.2: Average-size of operational holdings in India (In Hectares)

Source: Ministry of Agriculture, Govt. of India

The average size of operational holdings of ‘all size groups’ in India, has shown a gradual fall in all the agricultural censuses. While the average size was 1.55 hectares in 1990-91, it fell down to 1.41 in 1995-96 to 1.33 hectares in 2000-01, to 1.23 in 2005-06 and dropped down to 1.16 hectares in 2010-11.

Changes in Cropping Pattern: An Overview

Cropping pattern is defined as the proportion of area used for the production of different crops at a particular period of time. A change in cropping pattern means a change in the proportion of area under different crops. The changes in cropping pattern in India have been taking place as a result

of substitution of low productivity crops by the high value productivity crops. The cropping pattern in any area depends widely on agro-climatic, technical, socio-economic and institutional factors. The soil and climatic conditions in India are widely favorable to foodgrain productions and thus foodgrain crop dominate the production in the economy. The major food grains of India are rice, wheat, maize, millets, gram, and pulses. It also yields some cash crops such as sugarcane, condiments and spices, dry fruits, fruits and vegetables, tea, coffee, etc. Among the non-food crops constitutes of cotton, jute, oilseeds, tobacco, etc.

Table.4: Changes in percentage distribution of Gross Cropped Area

Crops	1990-91	2000-01	2010-11	2011-12	2012-13	2013-14
Rice	23	24.2	21.9	22.3	22	22.1
Wheat	12.9	13.9	15.2	15.4	15.7	15.6
Total Cereals & Millets	55.5	54.7	51.4	51.2	50.7	50.5
Total Pulses	13.4	11.5	12.8	12	11.3	11.8
Total Foodgrains	68.9	66.2	64.3	63.1	62	62.3

Sugarcane	2.1	2.5	2.6	2.8	2.8	2.8
Condiments & spices	1.3	1.5	1.7	1.9	1.7	1.6
Fruits & Vegetables	3.6	4.4	4.8	4.8	4.9	4.9
Total Food Crops	75.9	74.7	73.4	72.7	71.6	71.7
Total Oilseeds	13.5	13.3	14.6	14.3	14.9	15
Total Fibres	4.7	5.2	6	6.7	6.6	6.4
Total Non-Food Crops	24.1	25.3	26.6	27.3	28.4	28.3

Source: Agricultural Statistics at glance (2015-16)

The table shows a fall in the percentage share of gross cropped area under rice, pulses, and cereals and millets and jointly under total foodgrains but the area under wheat, sugarcane, condiments and spices and the fruits and vegetables depicts an upward trend. The area under oilseeds and total fibres also escalated. Under the foodgrains category, though the cereals and millets shows a decline in the area, but still there is dominance of it in the gross cropped area since 50.5% of total cropped area is

dedicated for the production of cereals and millets. The deviation in the area from total food crops to total non-food crops reflects a change from the traditional subsistence cropping to the commercial cropping, mainly influenced by the existing price in the market and the profitability per hectare. The change in the consumption pattern of the economy towards high value commodities has also attracted the farmers to increase the production area under the fruits and vegetables.

Table.5: Changes in Cropping pattern in India (Area in Million Hectares)

Year	1990-91	1995-96	2000-01	2005-06	2010-11	2013-14
Total Area under crops	185.742	187.471	185.340	192.737	197.563	200.859
Net Area sown	142.87	142.197	141.336	141.162	141.563	141.428
Cropping Intensity(%)	130.0	131.8	131.1	136.5	139.6	142.0
Area under Foodcrops	141.031	138.276	138.493	141.168	145.087	143.983
Area under Non-food crops	44.711	49.195	46.847	51.569	52.562	56.957
Net irrigated Area	48.024	53.402	55.205	60.837	63.659	68.1
Gross Irrigated Area	63.204	71.352	76.187	84.280	88.933	95.772

Source: Ministry of Agriculture & Farmer's Welfare, Govt. of India

The table indicates that the net sown area has gone down from 142.87 million hectares in 1990-91 to 141.428 million in the year 2013-14 but the total area under crops has extended from 185.742 million in 1990-91 to 200.859 millions in 2013-14 due to the increase in cropping intensity from 130% to 142% during the same period. The cropping intensity is measured as the percentage of gross cropped area to the net area sown. The table clearly affirms that the area under the food crops has remained almost stagnant during the period under study and has increased

from 141.03 million in 1990-91 to 143.983 millions in 2013-14. On the other side, the area under the non-food crops has expanded notably from 44.711 million to 56.957 during the same period. There is also an expansion in the net irrigated area and gross irrigated during the period of 1990-91 to 2103-14 but the increase in gross irrigated area (from 63.204 million in 1990-91 to 95.772 millions in 2013-14) is much higher than that of the rise in net irrigated area (from 48.024 million in 1990-91 to 68.1 millions in 2013-14).

Table.6: All India Area, Production and Yield of Principal Crops

Crops	1990-91			2015-16		
	Area (In MH)	Production (In MT)	Yield (Kg/Ha)	Area (In MH)	Production (In MT)	Yield (Kg/Ha)
Rice	42.7	74.29	1740	43.50	104.41	2400
Wheat	24.16	55.13	2281	30.41	92.29	3034
Maize	5.90	8.96	1518	8.81	22.57	2563
Coarse Cereals	36.31	32.70	900	24.40	38.52	1579
Total Cereals	103.17	162.12	1571	98.30	235.22	2393
Gram	7.52	5.35	712	8.39	7.17	840
Tur	3.61	2.42	673	3.97	2.56	646
Total Pulses	24.76	14.26	578	24.91	16.37	656
Total Foodgrains	127.8	176.40	1380	123.2	252.22	2056
Groundnut	8.31	7.51	904	4.56	6.77	1486
Rapeseed & Mustard	5.78	5.23	904	5.76	6.82	1184
Soyabean	2.56	2.6	1015	11.67	8.59	737
Oilseeds	24.15	18.61	771	26.13	25.30	968
Sugarcane	3.69	241.05	65395	4.95	352.16	71095

Cotton	7.44	9.84	225	11.87	30.15	432
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Note: MH-Million Hectares; MT-Million Tonnes; Ha- Hectares
 Source: Ministry of Agriculture & Farmer’s Welfare, Govt. of India

The table shows the change in area, production and yield of principal crops in India from the year 1990-91 to 2015-16. Rice, wheat, maize, gram, tur, and pulses displays an increase in the area and its production whereas there groundnut shows a decline for the same. There is a notable hike in the production of rice and wheat. While the production of wheat increased from 55.13 million tonnes in 1990-91 to 92.29 million tonnes in 2015-16, the production of rice also heightened from 74.29 million tonnes in 1990-91 and reached a peak of 104.41 million tonnes in the year 2015-16. With the introduction of hybrid maize seeds, the maize production which was 55.13 MT in 1990-91, rose to as high as 22.57 MT in 2015-16. Total Cereals shows a negative trend in its area but its production has increased from 162.12 million tonnes (MT) in 1990-91 to 235.22 million tonnes (MT) in 2015-16 due to the improvement in its yield per hectare. The area under total foodgrains has also decreased from 127.8 million hectare (MH) to 123.2 million hectares (MH) but the production escalated from 176.40 MT in 1990-91 to 252.22 MT in the year 2015-16. Area under oilseeds expanded from 24.15 MH in 1990-91 to 26.13 MH in 2015-16 and also the production rose from 18.61 MT to 25.30 MT during the same period. The area under sugarcane increased from 3.69 MH in 199-91 to 4.95 MH in 2015-16 and its production has shown a tremendous increase from 241.05 MT in 1990-91 to 352.16 MT in the year 2015-16. The area dedicated for cotton production also expanded from 7.44 MH to 11.87 MH during the period under study and its production displayed an upsurge from 9.84 MT in 1990-91 to 30.15 MT in 2015-16. This increase in production of cotton was mainly due to the introduction of Bt. cotton in 2002. By 2011-12, almost 90% of the areas

under cotton were covered with Bt cotton and so the production intensified because of the increase in its yield by almost 50 percent.

Diversification towards Horticulture

The effectiveness of horticulture in raising agricultural production, value addition, farm income and employment has been recognized long ago. Increasing the facilities for processing, marketing and storage, development of rain fed and irrigated horticulture was included as one of the important objective of new agricultural policy resolution, 1992, (Government of India, 1993). Horticulture production received a strong boost during 1990s (Chand *et al.*, 2007).

Table 7 shows the all India area, production and productivity of the horticultural crops from the year 1991-92 to 2015-16. The total area under the horticulture has increased gradually from 12770 (‘000 Ha) in 1991-92 to 23787 (‘000 Ha) in 2015-16. Among the total horticultural crops, though the area and production has been continually expanding, the area and production under the fruits and the vegetables are growing at much higher pace than the other crops. The area under fruits escalated from 2874 (‘000 Ha) in 1991-92 to 6405 (‘000 Ha) in 2015-16 and the production of fruits heightened from 28632 (‘000 MT) in 1991-92 to 91443 (‘000 MT) in the year 2015-16. The area under the vegetables expanded from 5593 (‘000 Ha) in 1991-92 to 9575 (‘000 Ha) in the year 2015-16. The production of vegetables experienced a tremendous hike from 58532 (‘000 MT) in 1991-92 to a record of 166608 (‘000 MT) in the year 2015-16.

Table.7: All India Area, Production and Productivity of Horticulture

Year	Fruits			Vegetables			Flowers & Aromatic			Plantation Crops			Spices			Total		
	A	P	Pdy.	A	P	Pdy.	A	P	Pdy.	A	P	Pdy.	A	P	Pdy.	A	P	Pdy.
1991-92	2874	28632	9.96	5593	58532	10.47				2298	7498	3.26	2005	1900	0.95	12770	96562	7.56
2001-02	4010	43001	10.72	6156	88622	14.4	106	535	5.05	2984	9697	3.25	3220	3765	1.17	16592	145785	8.79
2002-03	3788	45203	11.93	6092	84815	13.92	70	735	10.5	2984	9697	3.25	3220	3765	1.17	16270	144380	8.87
2003-04	4661	45942	9.86	6082	88334	14.52	101	580	5.74	3102	13161	4.24	5155	5113	0.99	19208	153302	7.98
2004-05	5049	50867	10.07	6744	101246	15.01	118	659	5.58	3147	9835	3.13	3150	4001	1.27	18445	166939	9.05
2005-06	5324	55356	10.4	7213	111399	15.44	129	654	5.07	3283	11263	3.43	2366	3705	1.57	18707	182816	9.77
2006-07	5554	59563	10.72	7581	114993	15.17	144	880	6.11	3207	12007	3.74	2448	3953	1.61	19389	191813	9.89
2007-08	5857	65587	11.2	7848	128449	16.37	166	868	5.23	3190	11300	3.54	2617	4357	1.66	20207	211235	10.45
2008-09	6101	68466	11.22	7981	129077	16.17	167	987	5.91	3217	11336	3.52	2629	4145	1.58	20662	214716	10.39
2009-10	6329	71516	11.3	7985	133738	16.75	183	1021	5.58	3265	11928	3.65	2464	4016	1.63	20876	223089	10.69
2010-11	6383	74878	11.73	8495	146554	17.25	191	1031	5.4	3306	12007	3.63	2940	5350	1.82	21825	240531	11.02
2011-12	6705	76424	11.4	8989	156325	17.39	760	2218	2.92	3577	16359	4.57	3212	5951	1.85	23243	257277	11.07
2012-13	6982	81285	11.64	9205	162187	17.62	790	2647	3.35	3641	16985	4.66	3076	5744	1.87	23694	268848	11.35
2013-14	7216	88977	12.33	9396	162897	17.34	748	3192	4.27	3675	16301	4.44	3163	5908	1.87	24198	277352	11.46
2014-15	6110	86602	14.17	9542	169478	17.76	908	3143	3.46	3534	15575	4.41	3317	6108	1.84	23410	280986	12
2015-16	6405	91443	14.28	9575	166608	17.4	860	3392	3.94	3683	15477	4.2	3264	6350	1.95	23787	283360	11.91

Note: A- Area (In ‘000 Hectares); P- Production (In ‘000 MT); Pdy.- Productivity (MT/ Hectare)
 Source: Horticultural Statistics at glance (2016)

The area share of flowers and aromatics shows a sudden decline from 535 (‘000 MH) in 2001-02 to 70 (‘000 MH) in

2002-03, but after that it continuously increased from 101 (‘000 MH) in 2003-04 to 860 (‘000 MH) in the year 2015-

16. The production of flowers and aromatics, however, increased tremendously from 535 ('000 MT) in 2001-02 to 3392 ('000 MT) in the year 2015-16. This exhibits the increasing preference of the farmers towards floriculture. Production of plantation crops also increased from 7498 ('000 MT) to 15477 ('000 MT) during the same period under consideration. Being a rich source of national income, plantation crops assume a greater significance in the Indian horticulture. The major ones are tea, coffee, rubber, etc. The area and production of spices has fluctuated through decades with the rise and fall in its area share and production. However, in total, the production of spices rose from 1900 ('000 MT) in 1991-92 to a record level of 6350 ('000 MT) in the year 2015-16. The diversification is much higher towards the fruits and vegetables mainly because of its high rate of return. Other major factors responsible for diversification towards horticulture crops are that the horticulture sector is mostly labour intensive and also helps to increase the earnings of the farmers and thereby offering them a chance to improve their standard of living.

Table.8: Production of horticulture vis-à-vis Foodgrains

Year	Production (In Million Tonnes)	
	Total Horticulture	Total Food grains
1991-92	97	168.37
1995-96	126	180.41
2000-01	153	196.81
2001-02	146	212.85
2002-03	144	174.77

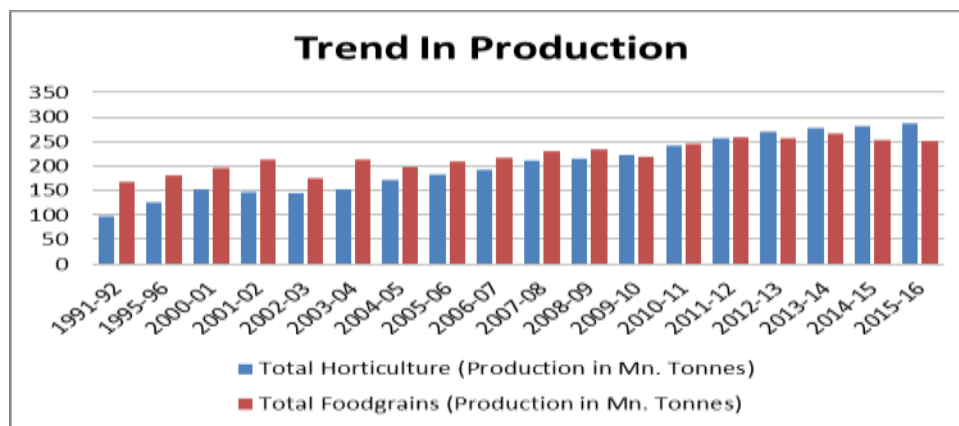
2003-04	153	213.19
2004-05	171	198.36
2005-06	183	208.6
2006-07	192	217.28
2007-08	211	230.77
2008-09	215	234.46
2009-10	223	218.1
2010-11	241	244.48
2011-12	257	259.28
2012-13	269	257.13
2013-14	277	265.04
2014-15	281	252.02
2015-16	286	251.56

Source: Ministry of Agriculture & Farmer’s Welfare, Govt. of India

Table-8 drawn above shows that there is continuous increase in the production of both horticulture and foodgrains. The total horticultural production which was 97 million tonnes in 1991-92 rose tremendously to a peak of 286 million tonnes in 2015-16. On the other hand, total foodgrains production also increased from 168.37 million tonnes in 1991-92 to 251.56 million tonnes during the year 2015-16. Though the production of foodgrains and horticulture both are rising over the last few decades, but the production of horticulture is higher than that of the foodgrains production.

Fig.3 shows the graphical presentation of table 8, which shows the trend in horticulture and foodgrains production. Both foodgrains and horticulture production shows an upward trend.

Fig-3: Trend in Foodgrains and Horticultural Production (In Million Tonnes)



During 1991-92 and after, the foodgrains production seem to be higher than the horticulture crops, but after 2008-09 the horticulture production shows a higher pace and after 2011-12, it outwent the production of the foodgrains in India.

It has been observed that production of both has increased but the main concern is about the slow pace of foodgrains productivity which may adversely affect the food security needs of the economy.

Conclusion

The Indian agriculture recognised the essence of diversification of crops away from cereals during 1980s, but this was not specifically towards the horticulture sector. Diversification towards horticulture was mainly recognised during the early 1990s which was also accompanied with the introduction of economic reforms and the liberalisations

in the economy. Among food grains, India in the largest producer of rice in the world. It also experienced enormous production of wheat, but the productivity of both is much lower as compared to some other countries. The economy has now slowly diversified from the production of food crops to the non-food crops such as cotton, sugarcane, etc. and the area under non-food crops has experienced much high rise than that of the food crops sector. It is important to note that the diversification towards horticulture has mostly been towards the fruits and vegetables. This may be because of change in demand due to the change in consumption habits of people. Other factors also responsible for diversification towards horticulture is its high rate of return and also the productivity is higher than the other food crops. India is now the highest producer of fruits and vegetables in the world. And though the area share of food crops has shown a declining trend over the

years, but as long as the production is increasing and the subsistence level of food grains for the country is also maintained, it is rather beneficial to experiment diversification towards horticulture crops since it enhances the national income of the country.

References

1. Agricultural Statistics at a glance, (2016); www.agricoop.nic.in & <http://eands.dacnet.nic.in>
2. Chand, Ramesh, S.S. Raju and L.M. Pandey (2007), "Growth Crisis in Agriculture – Severity and Options at National and State level", *Economic and Political Weekly*, Vol.42, No.26, June 30, pp. 2528-2533.
3. Chand. Ramesh, S.S. Raju and L. M. Pandey (2008), "Progress and potential of horticulture in India", *Indian Journal of Agricultural Economics*, Vol. 63, No. 3, July-Sept, pp. 299-309. FAO. 2001. Crop diversification in the Asian-pacific Region, Bangkok, and RAP Publication 2001/03.
4. Government of India (1993), *Economic Survey: 1992-93*, Ministry of Finance, Economic Division, New Delhi
5. Horticultural statistics at a glance. (2016); www.agricoop.nic.in & <http://eands.dacnet.nic.in>
6. Jha, D. (1996). Rapporteur's Report on Diversification of Agriculture and Food Security in the Context of New Economic Policy. *Indian Journal of Agricultural Economics* 51(4): 829-832.
7. Minot, N., Joshi, P.K. & Birthal, P.S. (2006). Sources of Agricultural Growth in India: Role of Diversification towards High-Value Crops. MTID Discussion Papers, No.98, IFPRI, Washington D.C.
8. Petit, M. and Barghouti, S. (1992) Diversification: Challenges and opportunities. In: *Trends in Agricultural Diversification: Regional Perspectives*, Eds.: Shawki Barghouti, Lisa Garbus and Dina Umali. World Bank Technical Paper Number 180. Washington D.C.