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Performance of agriculture and horticulture crops in Karnataka – A comparative study

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Abstract
Karnataka state has been well-versed in the agriculture, horticulture, sericulture, dairying and other allied activities. However, few studies have highlighted that from the last about three to four decades the agriculture sector has been showing negative Growth rate. Therefore, in this paper an effort has been made to analyse the performance of the horticulture sector in comparison with the agriculture based on the secondary data by using Compound Growth Rates (CGRs). The comparative analysis clearly highlights that the agriculture is going down from one decade to another whereas the horticulture sector is performing better. The paper suggests that in case further encouragement is given in the form of infrastructure like markets and in turn the price support the sector will be going to further heights, which is very much required for the overall development of the state of Karnataka.

Keywords: Agriculture, horticulture, area, production, growth, performance, positive, negative, infrastructure, price and development

Introduction

Karnataka state is the 8th biggest state in India, encompassing 1.92 lakh square kilometres and accounting for 6.30 per cent of the country's total land area. The state is divided into 31 districts and 176 taluks, with a total number of villages 29,340 to 29,500. Agriculture is the primary source of income for the majority of the rural population of Karnataka. According to the Census - 2011, agriculture employs 13.74 million people, with 23.61 per cent of farmers and 25.67 per cent of agricultural labourers. Another eight per cent of the rural people engaged in other agriculture and allied activities.

Karnataka cultivates about 1,23,100 km of land, accounting for 64.60 per cent of the state's total land area. The state is largely drought prone and irrigation is about 27 per cent of the total cultivated area. These are some of the major characteristic features of the Karntaka's agricultural sector As a result, a major amount of the state's agricultural area is subject to monsoon whims, posing serious agro-climatic and resource restrictions. With all these over 57 per cent of Karnataka's workforce is employed in agriculture. The southwest monsoon is critical for agriculture in Karnataka. While irrigation covers just 26.50 per cent of the planted land (30,900 km), 64.60 per cent of the entire geographical area is cultivated. In terms of overall horticultural area in India, the state is ranked sixth. It is the fifth-largest producer of vegetable crops and the third-largest producer of fruits and vegetables. It also produces most of the spices, aromatic and medicinal plants, and tropical fruits. After Gujarat, it is the state with the most milk production in the country (Assadi; 2006).

Karnataka also produces 12 per cent of all types of fruits, Eight per cent of all vegetables, and 70 per cent of coffee in the country. It is the world's third-largest sugar producer and fourth-largest producer of sugarcane and also it is the second-largest producer of floriculture. Despite a decline in its proportion of the state's GDP, agriculture continues to play a significant part in the state's overall growth. Horticulture crops cover around 15.21 lakh hectares in Karnataka, with an annual yield of 96.60 lakh tonnes. Karnataka is a leader in vegetable production, owing to its favourable meteorological circumstances, which include no fluctuations in temperature. It is also recognised for its floriculture industry and is a significant silk producer in the country. The state's fisheries industry is quickly becoming one of the most significant in allied agricultural operations.

Performance of the Agricultural Crops in Karnataka

Agriculture is the state's principal sector and primary source of income for the rural inhabitants. It is characterised by a wide range of agricultural diversity and remains largely reliant on the southwest monsoon's whims. The Table-01 clearly reveals that the total food grain crops in Karnataka is growing only at the rate of 0.06 per cent whereas the production and yield are growing at the rate of 1.93 and 1.87 per cent respectively. That means the performance of the area is very low whereas the production and the productivity is somewhat better when compared to the all India level. The factors which have been contributing for the increase in production and productivity are the usage of HYV seeds, application of Chemical Fertilizers and the Pesticides. However the area expansion is much low and there is heavy requirement for the expansion of the area under various crops to meet the growing demand for the food grains in the country (Chadha 2011) [1].

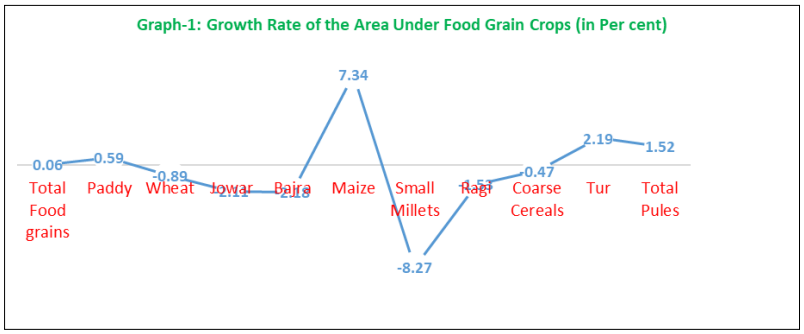
Table 1: Performance of Major Food Grain Crops in Karnataka During 1952-53 to 2021-22 (CAGR in per cent)

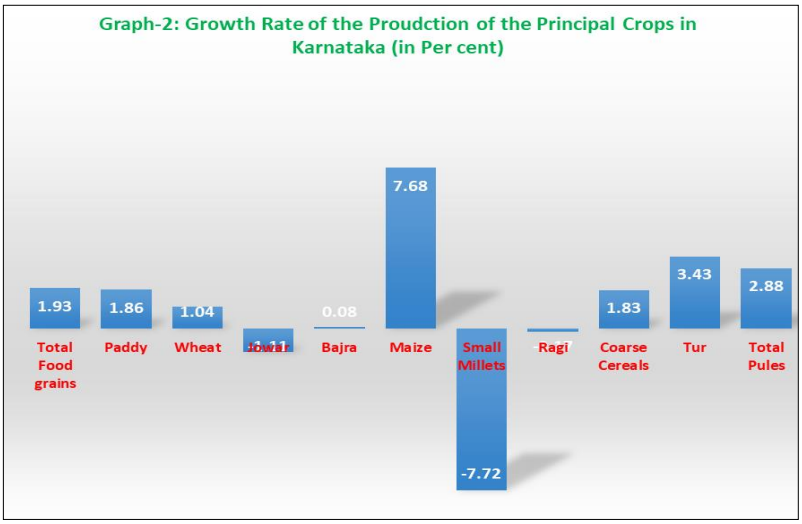
Particular	Cropped Area	Irrigated Area	Production	Yield
Total Food grains	0.06	1.80	1.93	1.87
Paddy	0.59	1.56	1.86	1.26
Wheat	-0.89	2.72	1.04	1.94
Jowar	-2.11	-0.99	-1.11	1.03

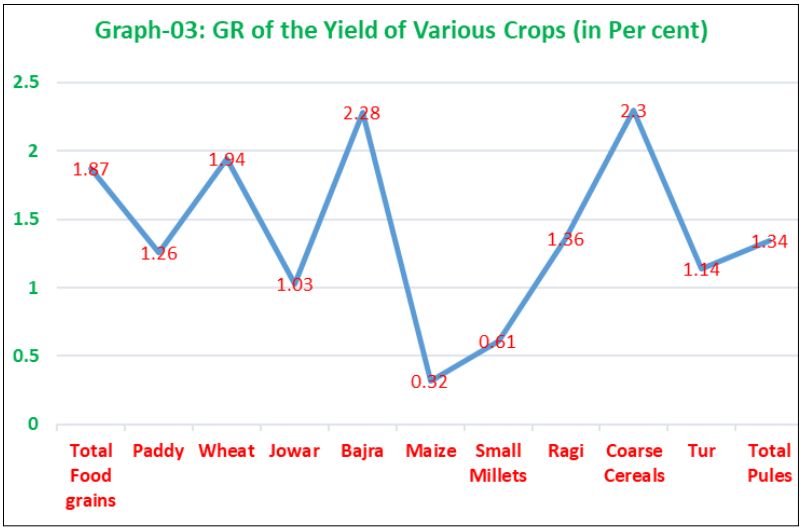
Bajra	-2.18	-0.33	0.08	2.28
Maize	7.34	4.35	7.68	0.32
Small Millets	-8.27	NA	-7.72	0.61
Ragi	-1.53	NA	-0.17	1.36
Coarse Cereals	-0.47	1.60	1.83	2.30
Tur	2.19	6.98	3.43	1.14
Total Pules	1.52	4.76	2.88	1.34

Source: 1). Calculation is based on the data collected from the Directorate 0f Economics and Statistics, Government of Karnataka
2) Various Issues of the Karnataka at a Glance and websites of http://kar.nic.in

The same Table-1 further reveals that out of the total 10 food grain crops presented in the table - six crops have been showing the negative growth rate among them Small Millets or Minor Millets, Bajra and Jowar have been showing higher negative GRs. The positive GR has been noticed in case of the area under Maize constituting 7.34 per cent and the total pulses it is 1.52 per cent. Even the production and productivity of these crops has been better when compared to the other crops. Overall it can be concluded that the performance of the agricultural crops in general is not encourasive in the state of Karnataka (Acharya 2012 and Kumar & Singh 2021) [1, 4]. Graphs-1,2 and 3 have been given to understand the table in a better manner.







Performance of the Major Commercial Crops in Karnataka

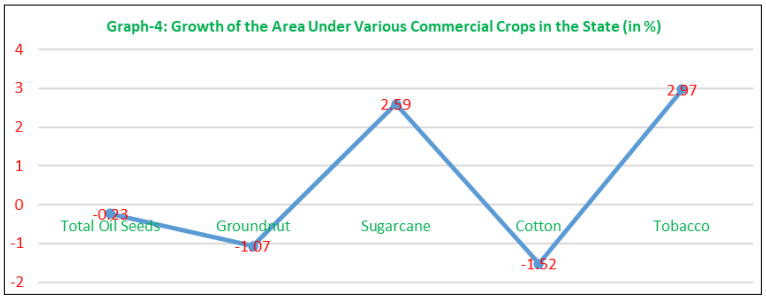
Performance of the major commercial crops has been presented in the Table-2. The table clearly reveals that the performance of the total oil seeds has been very poor as the area and production have been showing the negative growth rate to the extent of 0.23 and 0.16 per cent respectively. May be this is one of the reasons why we have been importing the edible oil from the last about three decades, because, Karnataka has been one of the major states to produce edible oils in the country. In Karnataka state groundnut has been the major crop, which is responsible to produce the edible oil even this crop also showing the negative growth rate to the extent of 1.07 per cent of the area and 1.49 per cent in the production.

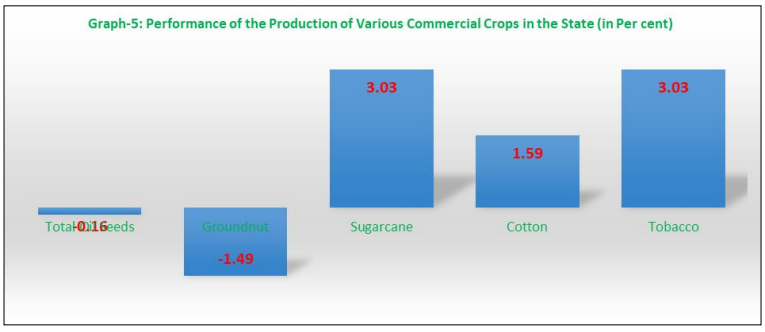
Table 2: Performance of Major Commercial Crops During the Period 1952-53 to 2021-22 in Karnataka (CAGR in %)

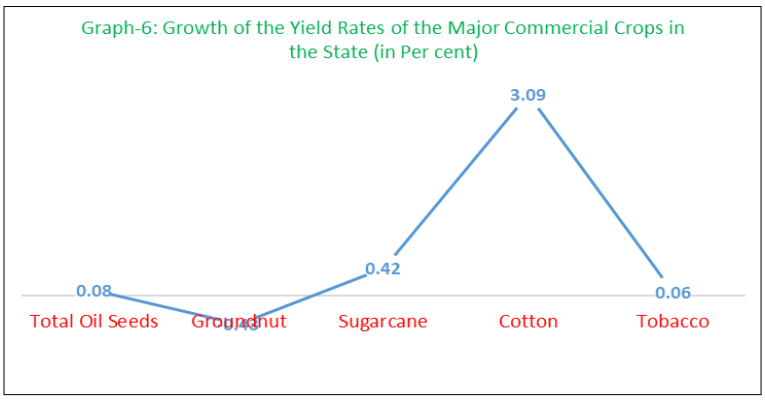
Particulars	Cropped Area	Irrigated Area	Production	Yield
Total Oil Seeds	-0.23	1.10	-0.16	0.08
Groundnut	-1.07	NA	-1.49	-0.43
Sugarcane	2.59	4.22	3.03	0.42
Cotton	-1.52	-1.52	1.59	3.09
Tobacco	2.97	9.04	3.03	0.06

Source: Calculation is based on the data collected from the Directorate of Economics and Statistics, Government of Karnataka

The same Table-1 reveals that the crop sugarcane and the crop tobacco are the two commercial crops, which are little promising as they are growing positively to the extent of 2.59 and 3.03 per cent of the area and production respectively in case of the crop sugarcane and 2.97 and 3.03 per cent of the area and production respectively in case of the crop tobacco. There is a strong reason for the growth of the sugarcane area and production i.e., providing irrigation facilities in the northern Karnataka over a period of time. The farmers find that sugarcane has been the crop to cultivate as there are sugar mills established hand in hand in the northern part of the state. Cotton crop has been showing the negative trend to the extent of 1.52 per cent of the area. However, though the production is showing positive growth, which is not an inducement for the farmers to take up this crop as the crop loss has been too high. The main reason for this is the furious pesticides, which are not that effective. Overall - the performance of the commercial crops is not that encouragement to the farmers in the state (Radhakrishna and Ray 2019) [9]. (Graph-4,5 and Graph-6 are given towards more clarity.







Performance of Horticulture Crops Over a Period of Time (1980-81 to 2023-24)

1. Performance of the Horticultural Crops before Liberalization Regime (1980-81 to 1989-90)

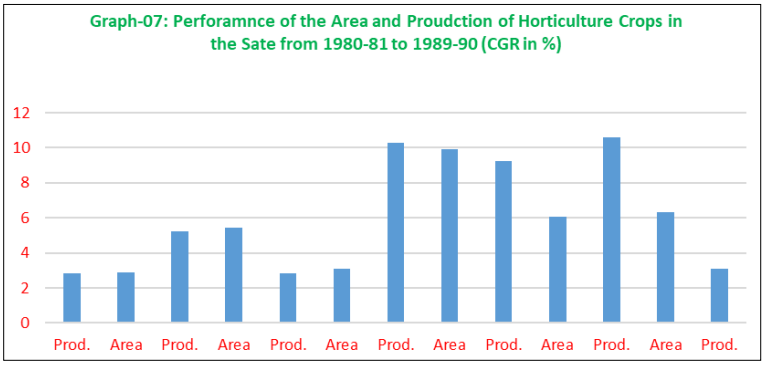
As it is already mentioned elsewhere, horticulture has been the promising sector for the farmers to manage the household expenses as the traditional food and commercial crops are not that promising specially for the Marginal and Small farmers. I would like to mention here that the data sources are not proper for the horticulture crops in terms of the area and production. Therefore, whatever possible we have tried our level best to collect the better data to convince the reader. However, here and there we find little inconsistency in the data set. But otherwise the broad picture of the horticulture sector in the state has been given by studying the same very carefully. It is vast data presented in the Table-3, which reveals that during the first period from 1980-81 to 1989-90 all the horticulture crops have been showing the positive trend (Mittal, et.al. 2007) [5], which highlights the fact that horticulture will go a long way in terms of development (Table-3):. Towards more clarity Graph-07 is given, which highlights that there is consistency in terms of the GR of the horticultural crops area and production in the state of Karnataka.

Table 3: Performance of the Horticultural Crops in the State (1980-81 to 2023-24)

Year	Fruit Crops		Vegetable crops		Spices, Garden and Plantation Crops		Commercial Flowers		Medicinal Plants		Aromatic Plants		Total Horticultural Crops	
	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.	Area	Prod.
1980-81	1.53	23.92	1.22	19.27	6.03	12.79	0.04	0.23	0.01	0.002	0.010	0.002	9.04	56.21
1981-82	1.56	24.31	1.20	18.82	6.54	13.44	0.05	0.25	0.01	0.002	0.010	0.002	9.35	56.82
1982-83	1.63	24.50	1.17	17.24	7.00	14.13	0.05	0.28	0.01	0.002	0.010	0.002	9.86	56.15
1983-84	1.68	25.10	1.23	18.17	7.20	14.50	0.06	0.31	0.01	0.002	0.010	0.002	10.17	58.08
1984-85	1.72	27.07	1.33	19.78	7.39	15.59	0.07	0.36	0.01	0.002	0.010	0.002	10.50	62.79
1985-86	1.74	27.73	1.41	22.32	7.65	16.02	0.07	0.39	0.01	0.002	0.010	0.003	10.88	66.46
1986-87	1.78	28.74	1.52	24.19	7.72	16.04	0.08	0.43	0.01	0.003	0.020	0.003	11.11	69.40
1987-88	1.84	28.32	1.60	25.31	7.79	16.21	0.09	0.46	0.02	0.003	0.020	0.003	11.31	70.29
1988-89	1.91	29.32	1.74	27.04	7.88	16.89	0.09	0.49	0.02	0.003	0.020	0.003	11.62	73.74
1989-90	2.00	30.50	1.81	27.75	8.00	17.33	0.10	0.52	0.02	0.003	0.020	0.003	11.90	76.10
CGR	2.84	2.86	5.23	5.43	2.84	3.10	10.29	9.91	9.22	6.08	10.61	6.34	3.07	3.87
1990-91	2.08	31.72	1.86	28.62	8.12	17.15	0.11	0.56	0.03	0.004	0.020	0.004	12.17	78.05
1991-92	2.13	33.87	1.88	32.65	8.18	17.08	0.12	0.63	0.03	0.004	0.020	0.004	12.31	84.22
1992-93	2.21	36.67	1.95	37.24	8.30	16.50	0.13	0.71	0.03	0.004	0.020	0.004	12.60	91.11
1993-94	2.34	40.27	2.09	42.94	8.41	15.82	0.14	0.79	0.03	0.004	0.020	0.005	12.97	99.83
1994-95	2.50	43.21	2.21	45.01	8.59	15.34	0.15	0.90	0.03	0.005	0.020	0.005	13.45	104.46
1995-96	2.67	45.93	2.28	46.64	8.88	16.82	0.17	0.99	0.04	0.005	0.020	0.005	14.00	110.37
1996-97	2.83	48.47	2.33	47.53	9.43	19.17	0.19	1.09	0.04	0.006	0.020	0.005	14.78	116.26
1997-98	2.96	47.57	2.58	45.96	9.41	17.30	0.19	1.07	0.04	0.006	0.020	0.006	15.14	111.90
1998-99	3.02	47.62	2.89	46.34	9.16	15.53	0.20	1.14	0.05	0.007	0.020	0.007	15.27	110.63
1999-00	3.06	45.50	3.23	45.14	8.76	12.41	0.20	1.19	0.05	0.007	0.020	0.007	15.25	104.24
CGR	4.98	4.69	6.08	4.93	1.51	-1.61	7.48	8.89	6.74	7.67	0.000	6.89	3.01	3.74
2000-01	3.07	46.79	3.33	46.73	8.77	13.34	0.21	1.30	0.060	0.008	0.020	0.008	15.36	108.16
2001-02	3.12	44.96	2.27	32.12	9.12	10.43	0.20	1.37	0.060	0.010	0.020	0.008	15.79	101.81
2002-03	2.55	40.39	2.38	31.71	9.33	8.49	0.18	1.45	0.060	0.011	0.020	0.009	15.83	97.29
2003-04	2.49	39.34	2.80	34.98	9.27	8.32	0.18	1.45	0.060	0.029	0.010	0.190	15.69	94.62
2004-05	2.51	39.83	3.67	43.49	9.46	9.28	0.19	1.47	0.006	0.019	0.010	0.180	15.84	94.13
2005-06	2.52	40.85	3.79	50.85	9.54	9.70	0.20	1.04	0.007	0.015	0.010	0.080	16.07	103.02
2006-07	2.64	43.87	3.95	60.39	9..86	10.61	0.21	1.20	0.008	0.019	0.010	0.090	16.69	116.68
2007-08	2.79	46.94	4.14	70.26	9.95	10.61	0.23	1.35	0.011	0.024	0.010	0.110	17.13	129.79
2008-09	2.99	50.90	4.20	70.45	10.16	10.97	0.25	1.95	0.015	0.028	0.010	0.130	17.63	134.43
2009-10	3.60	59.63	4.37	70.63	10.71	15.39	0.27	1.96	0.020	0.030	0.020	0.160	18.99	147.80
CGR	1.08	2.55	6.63	9.51	1.88	2.16	3.43	3.01	-18.60	13.92	-4.92	40.36	2.01	4.28
2010-11	3.54	61.33	4.38	73.80	10.78	14.81	0.28	1.96	0.020	0.050	0.020	0.180	19.02	152.13
2011-12	3.69	63.18	4.20	75.49	10.64	13.99	0.29	2.18	0.020	0.040	0.010	0.130	18.85	155.01
2012-13	3.77	63.47	4.03	72.20	10.22	11.51	0.30	2.19	0.020	0.040	0.020	0.180	18.36	149.59
2013-14	3.87	66.26	4.46	82.50	10.56	11.41	0.30	2.14	0.020	0.110	0.010	0.140	19.22	162.57
2014-15	3.93	66.88	4.56	79.56	14.40	16.40	0.30	3.10	0.01	0.90	0.02	0.30	19.91	183.90
2015-16	4.03	64.06	4.82	71.05	14.95	16.90	0.33	3.20	0.01	1.00	0.02	0.30	20.18	188.90
2016-17	3.48	73.90	4.80	90.50	15.50	17.30	0.36	3.40	0.01	1.10	0.02	0.30	20.55	196.40
2017-18	3.55	76.40	4.90	94.80	16.05	17.90	0.40	3.80	0.01	1.10	0.02	0.40	20.91	204.60
2018-19	3.63	78.60	5.00	98.20	16.50	18.40	0.42	3.80	0.01	1.20	0.02	0.40	21.26	211.40
2019-20	3.75	81.30	5.05	101.50	16.75	19.10	0.44	4.00	0.01	1.30	0.02	0.40	21.63	218.90
2020-21	3.90	82.50	5.10	103.20	17.05	19.60	0.45	4.10	0.01	1.40	0.02	0.40	21.83	222.90
2021-22	3.97	83.60	5.22	104.70	17.46	20.00	0.47	4.30	0.01	1.50	0.02	0.50	22.01	226.70
2022-23	3.76	84.80	4.50	106.50	18.71	20.60	0.42	4.50	0.01	1.60	0.02	0.50	27.43	221.71
CGR	0.27	3.07	1.53	3.69	5.39	4.34	4.77	7.61	-6.63	39.98	3.09	11.66	2.33	3.93
Overall CGR	2.29	3.01	3.86	4.35	2.19	0.14	5.23	6.95	-1.02	18.70	0.65	17.21	2.16	3.35

Sources: 1. Department of Horticulture, Government of Karnataka; http://www.horticulture.kar.nic.in

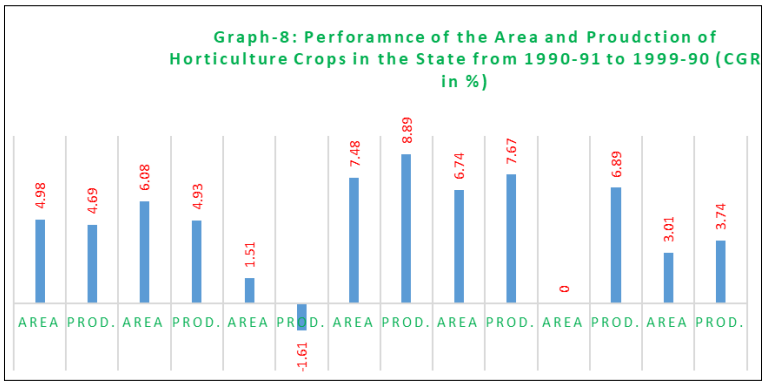
2. Conversation or Chatting with a Computer – Generative Pre-Trained Transformer by using Artificial Intelligence



Note: Frist Two Variables in the Order – 1).Area and Production of Fruit Crops; 2. Vegetable Crops; 3). Spices, Garden and Plantation Crops; 4). Commercial Flowers; 5). Medicinal Plants; 6). Aromatic Plants and 7). Total Horticultural Crops

2. Performance of the Horticultural Crops During the Liberalization Regime (1990-91 to 1999-2000)

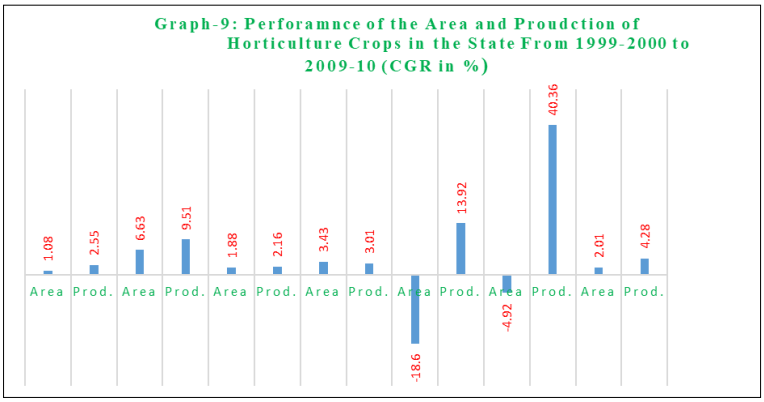
During the liberalisation also we find a positive change unlike the agricultural crops. Fruit crops and vegetable crops the overall performance has been more and that can be highlighted from the same Table-3. Overall horticulture crops performance is positive when compared to the agricultural crops. Though there is little variation from the pre-liberalization regime to liberalization regime. The area under fruit crops and vegetable crops has been more than the pre-liberalization regime. May be other crops like spices, garden and plantation crops, commercial flowers, medicinal plants and aromatic plants we find the mixed trend in terms of the performance. However, the area and production we find the positive trend to the extent of 3.01 and 3.74 per cent respectively. The same results are presented in the Graph-8 towards more clarity.



Note: Frist Two Variables in the Order – 1).Area and Production of Fruit Crops; 2. Vegetable Crops; 3). Spices, Garden and Plantation Crops; 4). Commercial Flowers; 5). Medicinal Plants; 6). Aromatic Plants and 7). Total Horticultural Crops

3. Performance of the Horticultural Crops During the Second Phase of Liberalization Regime (2000-01 to 2009-10)

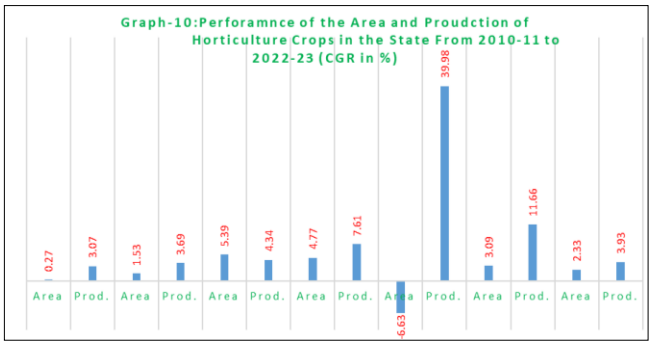
During this period the performance of the vegetable crops has been extraordinary as they are growing at the rate of 6.63 and 9.51 of the area and production of vegetable crops respectively. This clearly shows that the horticulture sector has been positive and also it is higher side when compared to the agricultural crops of the same period. The overall growth rate is 2.01 and 4.28 of the area and production. Hence the performance of the horticulture crops really better as they are growing positively throughout the period i.e., from 2000-01 to 2009-10. Except the area under medicinal plants all the other crops are growing positively, which is a welcome trend (Singh et.al. 2014) [7]. Graph-9 is given to give a clear picture of the performance of the sector during the second phase of the liberalization regime.



Note: Frist Two Variables in the Order – 1).Area and Production of Fruit Crops; 2. Vegetable Crops; 3). Spices, Garden and Plantation Crops; 4). Commercial Flowers; 5). Medicinal Plants; 6). Aromatic Plants and 7). Total Horticultural Crops

4. Performance of the Horticultural Crops During the Liberalization Regime (2009-10 to 2022-23)

The performance of the horticulture crops in the latest years starting from 2010-11 to 2023-24 has been very much positive of all the crops. However, the performance of spices, garden and plantation crops; commercial flowers, medicinal plants (only production); aromatic plants really commendable. Since the base value is less the medicinal plants production has been showing extraordinarily very high. The overall growth of all the horticultural crops has been positive and much better than the agricultural crops like food-grains, pulses, oilseeds and some of the commercial crops. However, the performance of the sugarcane and the tobacco are exceptional as they are also performing better. Graph-10 has been given towards more clarity of the performance of the horticultural crops. Overall from the year 1980-81 to 2022-23 we find that the performance of the horticulture sector is positive and not even a single crop (group of crops) has been showing negative growth unlike the agricultural crops in the state. And hence it can be said that there is lot of scope for the development of the horticultural sector to improve the rural economy of the state (Doddamani et.al. 2014 and Nabi et.al. 2017) [3, 8].



Note: Frist Two Variables in the Order – 1).Area and Production of Fruit Crops; 2. Vegetable Crops; 3). Spices, Garden and Plantation Crops; 4). Commercial Flowers; 5). Medicinal Plants; 6). Aromatic Plants and 7). Total Horticultural Crops

Conclusion

Over a period of time the agriculture and horticulture sectors performance has been undergone a sea change. Many ups and downs the two sectors have seen. For instance the performance of the agriculture sector was better during the green revolution period and we have learnt lot of lessons. However, after the green revolution especially during 1980's the performance was very low (Rao and Gopalappa 2004) [10]. Since then the agriculture sector didn't take any quantum jump. Whereas the horticulture sector was not considered seriously up to the period of liberalization. During the liberalization regime we have realised the importance of the sector. Today it is contributing about 33 per cent of the GDP of the agriculture sector and also earning considerable amount of the foreign exchange. Therefore, the Government of India and Karnataka started giving importance and hence it is growing faster than the agriculture sector. To develop the sector further an effort has to be made to educate the farmers/horticulturists regarding the markets and the prices of various commodities during various seasons so that the farmers/horticulturists gain a lot and there will be possibility of the overall development of the rural economy.

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