

Growth in Area, Production and Productivity of Horticultural Crops in Karnataka

Tawheed Nabi¹ and S. T. Bagalkoti²

Abstract: *Growth rate analysis is usually used in economic studies to find out the trend of particular variable over any period of time which is used for making policy decisions. The growth in the area, production and yield of horticultural crops in Karnataka was estimated by using the compound growth function. Area under fruit crops in the state of Karnataka gradually increased from 1.53 lakh hectare in TE 1980-81 to 2.08 lakh in TE 1990-91 which further increased to 3.87 lakh hectares in 2013-14. In consonance with area, production of fruits also increased in the state from 24 lakh tonnes in the TE 1980-81 to 32 lakh tonnes in TE 1990-91 and further to 47 lakh tonnes in TE 2000-01. Production of fruits also recorded fluctuations in the 2000s and total fruit production was recorded as 66 lakh tonnes in TE 2013-14. District wise rank of total area under horticulture crops in Karnataka has been identified where; Tumkur stands on first rank with 11 percent area followed by Chikmangalore 6.6 percent area followed by Chitardurga, Hassan, D Kannada, Kolar, Davengree and Mandiya respectively. Growth rates in present decade of 2000s, has shown some reversal in area and yield growth rates. The fruits crops that had impressive growth rate in area during the 1980s and 1990s, observed negative but insignificant growth in area while had significant 1.7 percent growth in yield rate during the 2000s. Vegetables continued accelerating their area expansion in the 2000s as well, whereby area under vegetables expanded at even faster rate of 7 percent per annum. Their yield also experienced around 2.7 percent growth rate, albeit significant at 10 percent level.*

Keywords: Growth rates, Major crops, Productivity, Horticulture

Introduction

Agriculture has remained the backbone of Karnataka and is still the mainstay of the state economy. The GSDP growth rate of agriculture and allied activities has decreased by 4.5 percent in the State during 2014- 15 as against a growth of 9.4 percent during 2013-14. The fall in the growth rate of agriculture and allied activities during 2014-15 is due to decline in the production of food grains by 3 percent. Despite the declining share of primary sector in GSDP, agriculture remains the primary activity and main livelihood source for the rural population in the state. Agriculture is highly dependent on the vagaries of the southwest monsoon as out of the net area sown, only 35 per cent is irrigated. As per the land utilization statistics for 2011-12, out of total 190.5 lakh hectares geographical area of the state, total cropped area was 121.6 lakh hectares that was 64.9 percent of the total geographical area. The net area cropped constituted around 53 percent of the total geographical area and the fallow land was around 10.6 percent

¹ Research Scholar, Department of Economics, Karnatak University, Dharwad

² Professor, Department of Economics, Karnatak University, Dharwad

Corresponding author: Tawheed Nabi can be contacted at: tawheed1990@gmail.com

Any remaining errors or omissions rest solely with the author(s) of this paper

Growth in Area, Production and Productivity of Horticultural Crops in Karnataka

of the geographical area. Around 16 percent of the area was covered under forest. 7.2 percent land was under non agricultural uses, 4.1 percent land was barren and uncultivated and 2.2 percent land was cultivable waste. Permanent pastures, grazing land and miscellaneous tree crops constituted around 6.3 percent of the total geographical area of the state. There are no indications of any increase in cropping intensity in the state since the beginning of the decade and the recorded cropping intensity in 2011-12 was 121.3 (Economic Survey of Karnataka 2014-15).

Karnataka is one of the most progressive states with great potential for horticultural development. The state is gifted with ten different agro-climatic regions suitable for growing variety of fruits and vegetables all round the year. The horticultural crops grown in Karnataka are grouped into four broad categories, viz;

- 1) Fruits
- 2) Vegetables,
- 3) Spices/ plantation crops and
- 4) commercial flowers.

Apart from these cultivation of potential high value crops like aromatic and medicinal herbs are also taken up in certain areas. Karnataka occupies a prominent place in the Horticulture map of the country. Karnataka is the largest producer of coarse cereals, coffee, raw silk and tomatoes among the states in India. Horticulture generates 40 percent of the total income of the state. This accounts for 17 per cent of the GDP of the state. In floriculture, Karnataka occupies the second position in India in terms of production and 700 tons of flowers (worth Rs.500 million) were produced in 2004-05. Horticulture has taken a front line position in Karnataka agriculture and the sector is growing at a rapid pace. As a result, there is an increasing trend in the area under horticulture crops. During the year 20013-14 an area of 19.22 lakh hectares was covered by horticultural crops and production was 162.57 lakh tons. (Horticulture Dept. GOK). The state is preparing strategies to ensue more flexibility and advancement in cultivating various fruits, vegetables and other horticultural crops which is adding value to Karnataka's economy to a great extent.

Brief Literature Review

Acharya et.al, (2012) has analyzed the growth in the area, production and productivity of different crops in Karnataka by using the compound growth function and has found that area under jowar, bajra, ragi and minor millets are experiencing a substantial annual decrement. Whereas area under rice has recorded a mild annual increment, the growth in area under oilseeds and commercial crops was negative and insignificant. Similarly the production of cereals, pulses, vegetables and fruits showed a significant positive growth. The productivity of different crops recorded significant growth in the case of cereals, pulses and fruits.

Singha et.al (2014) has studied Growth and Diversification of Horticulture Crops in Karnataka an inter-district analysis and has found that the districts of Gulbarga, Raichur, Bijapur, Bidar, Koppal, Bagalkot, and Bellary showed a complete diversification toward horticulture crops, whereas the districts of Kolar, Udupi, and Dakshina Kannada were found to be diversified the least. The study has also explored that the districts having complete diversification toward horticulture sector were found to have devoted a lesser share of their cultivable area under horticulture crops. Also, most of the highly diversified districts have come under the dry agro-climatic zones and experienced a high growth rate of horticulture crops cultivation from triennium ending (TE) 2002-2003 to TE 2009-2010. However, the lesser diversified districts

have got lesser growth rate of area under the horticulture crops, but devoted relatively a higher share of area under the crops.

Deodhar et al (2006) has made an attempt to see the problems of cold storage facilities available and has found that infrastructural problems pertaining to the cold storage facilities are dual as some places don't have the cold storage while other places have the problem of underutilization of the existing cold storage. The utilization is even lower than 30 per cent of the total capacity in many cases. There are problems with price structure in the processing units; the price offered by them does not justify the prevailing wholesale price or even the cost of production of the produce. Development of competitive international transportation, linked to domestic air, road and rail transport would help in the reduction of post-harvest losses. High air freights are also a hindrance for cost-effective exports.

Surabhi Mittal (2007) has made an analysis on exports and has come to conclusion that export function of Indian horticultural products has positive price elasticities. However it's also seen that prices are not really important, factors like standards or information about the market needs as well as available management techniques and technologies could play important role. Horticultural products are competitive in terms of cost of production, they do not remain so once they reach the US or European markets.

Objectives

To analyse the growth trends of area, production and yield of horticultural crops in Karnataka
To analyse the role of horticulture in the development of Agriculture of Karnataka

Methodology

The data has been obtained from official websites and official records & documents; such as Horticulture Department of Karnataka (various issues), National Horticulture Board (NHB), Agricultural and Processed Food Products Export Development Authority (APEDA), Handbook of Horticulture, Statistical Year Book and others. Different Books, Reports, and Research Papers have been consulted to generate the idea and of literature available. Statistical techniques and tools like trend analysis, Percentages, Growth rates have been applied in drawing results and analysis of data.

Results and Analysis

Table 1 presents statistics on the geographical, cultivable and horticultural area in Karnataka at the district and state level for Triennium Ending (TE) 2008-09 and 2013-14. There is a decline in geographical area of Bangalore Rural and Kolar districts as out of these two districts, Ramanagara and Chikkaballapura districts were carved out. At the aggregate, there is a decline in cultivable area in Karnataka from 2008-09 to 2013-14 because of increasing non-agricultural uses of land. Cultivable area declined from 12.6 million hectares in TE 2008-09 to 12.5 million hectares in TE 2013-14. The percentage of cultivable area to geographical area had decreased from 66.4 percent in TE 2008-09 to 63.7 percent in TE 2013-14. At the district level, there was no unique trend of either declining or increasing cultivable area. Some districts observed steep decline in cultivable area as a percentage of geographical area. For example, in Bangalore urban, cultivable area declined from 35 percent in TE 2008-09 to 32 percent in TE 2013-14 and in Davangree district cultivable area declined from 72 percent to 69 percent during the same period of time. Gadag district observed a decline from 98 percent in TE 2008-09 to 87 percent in TE 2013-14, while as Kopal

Growth in Area, Production and Productivity of Horticultural Crops in Karnataka

district observed decline in cultivable area from 85 percent to 82 percent during the above mentioned time period. Against the decline trends, Bangalore rural district observed an increase in cultivable area from 59 percent in TE 2008-09 to 63 percent in TE 2013-14; Kolar from 53 percent to 60 percent, Tumkur from 64 percent to 66 percent and Mandya from 60 percent to 63 percent during the same time period.

Unlike cultivable area that observed a decline over time for Karnataka as a whole, the area under horticultural crops observed substantial increase. The aggregate area under horticulture crops increased from 1.81 million hectares in TE 2008-09 to 3.69 million hectares in TE 2013-14. The percentage of area under horticultural crops to cultivable area increased from 14.36 percent in TE 2008-09 to 30.44 percent in TE 2013-14 (Figure 1). The area under horticultural crops increased in almost all the districts during this time period with the only exception of Bangalore urban that observed decline in area under horticultural crops from 17 thousand hectares in TE 2008-09 to 10 thousand hectares in TE 2013-14. The possible reason for decline in area under horticultural crops in the Bangalore urban might have been decline in overall cultivable area in the district because of massive diversion of farmland to urban uses during the last ten years. The districts that observed major increase in area under horticultural crops included Tumkur, Devanagere, Shimoga, Chamarajanagar, Hasan, Haveri and Raichur.

Table 1: District wise geographical, cultivable and horticultural crop area in the state Karnataka (000' Hectares)

Name of the district	Geographical area		Cultivable area during		% age cultivable area to geographical area		Area under horticulture crops		% age horticulture area to cultivable area	
	TE 2008-09	TE 2013-14	TE 2008-09	TE 2013-14	TE 2008-09	TE 2013-14	TE 2008-09	TE 2013-14	TE 2008-09	TE 2013-14
B'lore (U)	217.41	217.41	76.65	70.09	35.26	32.24	16.87	10.28	22.01	14.67
B'lore (R)	348.16	229.519	207.22	145.79	59.52	63.52	43.22	26.642	20.86	18.27
Chikkaballapura	269.67	404.501	327.57	221.79	121.47	54.83	30.48	47.075	9.30	21.23
Chitradurga	770.7	770.702	503.32	498.67	65.31	64.70	103.52	124.905	20.57	25.05
Davangere	597.6	597.597	433.65	414.71	72.57	69.40	65.12	82.188	15.02	19.82
Kolar	509.8	374.966	272.39	226.98	53.43	60.53	113.54	108.883	41.68	47.97
Ramanagara	237.27	355.912	137.07	205.61	57.77	57.77	39.61	59.658	28.90	29.01
Shimoga	847.78	847.784	261.08	262.27	30.80	30.94	60.79	78.584	23.28	29.96
Tumkur	1064.76	1064.755	691.91	706.53	64.98	66.36	180.44	212.689	26.08	30.10
Bagalkote	658.88	658.877	539.23	518.37	81.84	78.67	28.11	33.974	5.21	6.55
Belgaum	1344.38	1344.382	1020.45	1000.35	75.90	74.41	63.7	73.263	6.24	7.32
Bijapura	1053.47	1053.471	989.74	969.85	93.95	92.06	31.37	46.066	3.17	4.75
Dharwad	427.33	427.329	409.37	358.25	95.80	83.83	101.93	75.002	24.90	20.94
Gadag	465.72	465.715	460.5	407.13	98.88	87.42	52.7	56.086	11.44	13.78
Haveri	485.16	485.156	401.96	381.16	82.85	78.56	81.22	701.19	20.21	183.96
U.Kannada	1024.68	1024.679	130.46	132.42	12.73	12.92	33.47	38.207	25.66	28.85
Bellary	813.2	813.196	572	517.52	70.34	63.64	38.45	56.477	6.72	10.91
Bidar	541.77	541.765	432.27	427.90	79.79	78.98	14.64	21.297	3.39	4.98
Gulberga	1610.21	1094.12	1379.19	945.70	85.65	86.43	26.45	21.788	1.92	2.30
Koppal	552.5	552.495	474.76	457.26	85.93	82.76	21.64	24.207	4.56	5.29
Raichur	835.84	835.813	734.38	732.83	87.86	87.68	70.27	14.573	9.57	1.99
Yadagiri	N.A	516.088	NA	409.86		79.42		6.73		1.64
Chamarajanagara	569.9	569.901	214.26	213.11	37.60	37.39	40.95	49.999	19.11	23.46
Chikmagalore	722.08	722.075	327.57	320.71	45.36	44.42	115.06	1272.05	35.13	396.63
D. Kannada	477.15	477.381	148.48	142.48	31.12	29.85	98.45	110.331	66.31	77.43
Hassan	662.6	662.602	453.74	439.61	68.48	66.35	149.42	122.998	32.93	27.98
Kodagu	410.78	410.775	167.51	177.77	40.78	43.28	31.88	33.562	19.03	18.88
Mandya	498.24	498.244	300.87	313.62	60.39	62.95	73.09	78.732	24.29	25.10
Mysore	676.38	676.382	467.99	419.22	69.19	61.98	38.94	58.816	8.32	14.03
Udupi	356.45	356.446	115.1	111.12	32.29	31.17	51.31	51.963	44.58	46.76
State Total	19049.87	19050.038	12650.69	12148.67	66.4077	63.7724	1816.64	3698.215	14.36	30.44

Source: Compiled from Department of Horticulture, Government of Karnataka; <http://www.horticulture.kar.nic.in/>

Fig 1: Percentage of Cultivable area under horticultural crops in Karnataka

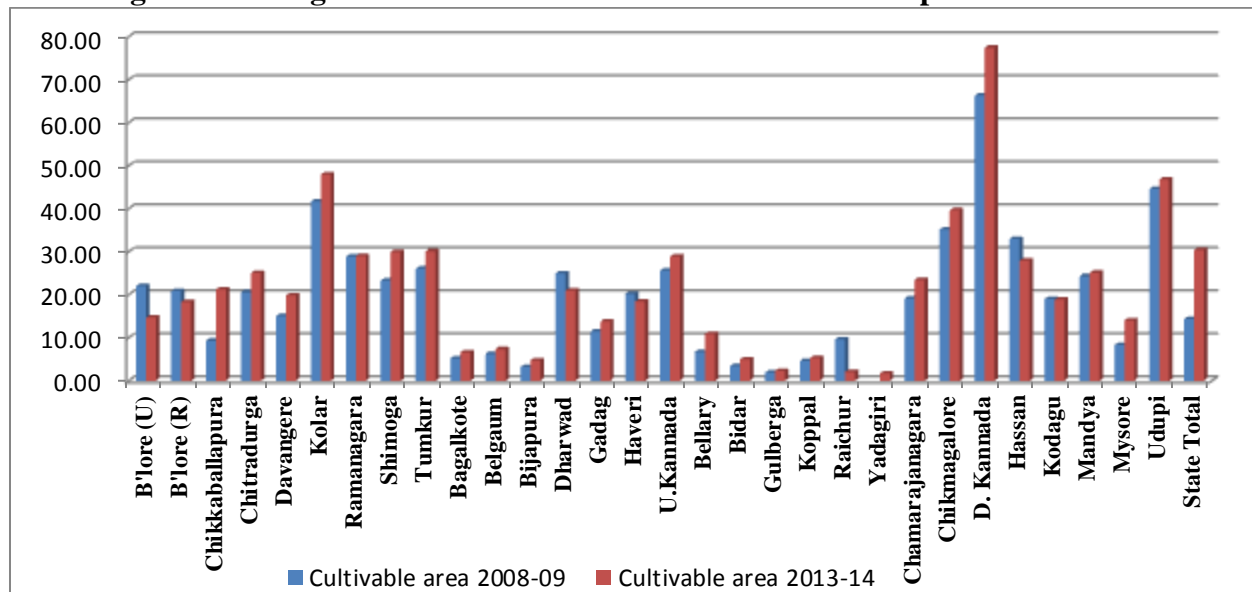


Table 2 presents area and production of horticultural crops in Karnataka during the last 35 years. Area under fruit crops in the state gradually increased from 1.53 lakh hectares in TE 1980-81 to 2.08 lakh hectares in TE 1990-91 which further increased to 3.87 lakh hectares in TE 2013-14. However, area under fruits declined marginally in the decade of 2000s and in the TE 2013-14 fruit area was recorded as 3.87 lakh hectares. In consonance with area, production of fruits also increased in the state from 24 lakh tonnes in the TE 1980-81 to 32 lakh tonnes in TE 1990-91 and further to 47 lakh tonnes in TE 2000-01. Production of fruits also recorded fluctuations in the 2000s and total fruit production was recorded as 66 lakh tonnes in TE 2013-14. Area under vegetables increased from 1.2 lakh hectares in TE 1980-81 to 3.3 lakh hectares in TE 2000-01, which further increased to 4.4 lakh hectares in TE 2013-14. Production of vegetables increased from 19 lakh tonnes in TE 1980-81 to 47 lakh tonnes in TE 2000-01 and further to 82 lakh tones in TE 2013-14. There was small area under commercial flowers in 1980s. The recorded area under commercial flowers in TE 1980-81 was 4000 hectares that steeply increased to 21 thousand hectares (almost five times) in TE 2000-01 which further increased to 30 thousand hectares in TE 2013-14. Production of commercial flowers increased from 23 thousand tonnes in TE 1980-81 to 214 thousand tonnes in TE 2013-14.

Medicinal and aromatic plants are commercialized only during the recent periods. Karnataka stands 7th place in area under aromatic and medicinal plants. The latest data available on area and production of aromatic and medicinal plants in the state is only from the present decade. In TE 2003-04 only a miniscule area of 500 hectares was under medicinal plants and 1000 hectares under aromatic crops. In TE 2008-09 the area under medicinal plants was almost four times, 5000 hectares while there was no further increase in area under aromatic crops.

Despite increase in area under medicinal plants, production of medicinal as well as aromatic plants, earlier remained stagnant or declined indicating no further increase in their productivity but from TE 2009-10 it has increased and has reached up to 11000 tonnes in TE 2013-14. Similarly, area under plantation increased till the early 1990s but experienced

stagnation thereafter and their production started declining in the late 1990s. The production of spices was measured 12.8 lakh tones in the TE 1980-81 that declined to 11.41 lakh tones in TE 2013-14.

On account of expansion in area under fruits, vegetables and commercial flowers, overall area under horticultural crops in Karnataka increased persistently during the last 35 years. Horticultural area increased from 9 lakh hectares in TE 1980-81 to 15 lakh hectares in TE 2000-01 and 19 lakh hectares in TE 2013-14. The production increased from 56 lakh tonnes in TE 1980-81 to 108 lakh tonnes in TE 2000-01 and further to 163 lakh tonnes in TE 2013-14.

Growth in Area, Production and Productivity of Horticultural Crops in Karnataka

Table 2: Area and production of horticultural crops in the state Karnataka (Area in lakh hectares, production in lakh tones)

Year	Fruits		Vegetables		Spices, garden & plantation		Commercial Flowers		Medicinal		Aromatic		Total	
	Area	Prodn.	Area	Prodn.	Area	Prodn.	Area	Prodn.	Area	Prodn.	Area	Prodn.	Area	Prodn.
TE 80-81	1.53	23.92	1.22	19.27	6.03	12.79	0.04	0.23	-	-	-	-	9.04	56.21
TE 81-82	1.56	24.31	1.2	18.82	6.54	13.44	0.05	0.25	-	-	-	-	9.35	56.82
TE 82-83	1.63	24.5	1.17	17.24	7	14.13	0.05	0.28	-	-	-	-	9.86	56.15
TE 83-84	1.68	25.1	1.23	18.17	7.2	14.5	0.06	0.31	-	-	-	-	10.17	58.08
TE 84-85	1.72	27.07	1.33	19.78	7.39	15.59	0.07	0.36	-	-	-	-	10.5	62.79
TE 85-86	1.74	27.73	1.41	22.32	7.65	16.02	0.07	0.39	-	-	-	-	10.88	66.46
TE 86-87	1.78	28.74	1.52	24.19	7.72	16.04	0.08	0.43	-	-	-	-	11.11	69.4
TE 87-88	1.84	28.32	1.6	25.31	7.79	16.21	0.09	0.46	-	-	-	-	11.31	70.29
TE 88-89	1.91	29.32	1.74	27.04	7.88	16.89	0.09	0.49	-	-	-	-	11.62	73.74
TE 89-90	2	30.5	1.81	27.75	8	17.33	0.1	0.52	-	-	-	-	11.9	76.1
TE 90-91	2.08	31.72	1.86	28.62	8.12	17.15	0.11	0.56	-	-	-	-	12.17	78.05
TE 91-92	2.13	33.87	1.88	32.65	8.18	17.08	0.12	0.63	-	-	-	-	12.31	84.22
TE 92-93	2.21	36.67	1.95	37.24	8.3	16.5	0.13	0.71	-	-	-	-	12.6	91.11
TE 93-94	2.34	40.27	2.09	42.94	8.41	15.82	0.14	0.79	-	-	-	-	12.97	99.83
TE 94-95	2.5	43.21	2.21	45.01	8.59	15.34	0.15	0.9	-	-	-	-	13.45	104.46
TE 95-96	2.67	45.93	2.28	46.64	8.88	16.82	0.17	0.99	-	-	-	-	14	110.37
TE 96-97	2.83	48.47	2.33	47.53	9.43	19.17	0.19	1.09	-	-	-	-	14.78	116.26
TE 97-98	2.96	47.57	2.58	45.96	9.41	17.3	0.19	1.07	-	-	-	-	15.14	111.9
TE 98-99	3.02	47.62	2.89	46.34	9.16	15.53	0.2	1.14	-	-	-	-	15.27	110.63
TE 99-00	3.06	45.5	3.23	45.14	8.76	12.41	0.2	1.19	-	-	-	-	15.25	104.24
TE 00-01	3.07	46.79	3.33	46.73	8.77	13.34	0.21	1.3	-	-	-	-	15.36	108.16
TE 01-02	3.12	44.96	2.27	32.12	9.12	10.43	0.2	1.37	-	-	-	-	15.79	101.81
TE 02-03	2.55	40.39	2.38	31.71	9.33	8.49	0.18	1.45	-	-	-	-	15.83	97.29
TE 03-04	2.49	39.34	2.8	34.98	9.27	8.32	0.18	1.45	0.005	0.029	0.01	0.19	15.69	94.62
TE 04-05	2.51	39.83	3.67	43.49	9.46	9.28	0.19	1.47	0.006	0.019	0.01	0.18	15.84	94.13
TE 05-06	2.52	40.85	3.79	50.85	9.54	9.7	0.2	1.04	0.007	0.015	0.01	0.08	16.07	103.02
TE 06-07	2.64	43.87	3.95	60.39	9.86	10.61	0.21	1.2	0.008	0.019	0.01	0.09	16.69	116.68
TE 07-08	2.79	46.94	4.14	70.26	9.95	10.61	0.23	1.35	0.011	0.024	0.01	0.11	17.13	129.79
TE 08-09	2.99	50.9	4.2	70.45	10.16	10.97	0.25	1.95	0.015	0.028	0.01	0.13	17.63	134.43
TE 09-10	3.6	59.63	4.37	70.63	10.71	15.39	0.27	1.96	0.02	0.03	0.02	0.16	18.99	147.8
TE 10-11	3.54	61.33	4.38	73.8	10.78	14.81	0.28	1.96	0.02	0.05	0.02	0.18	19.02	152.13
TE 11-12	3.69	63.18	4.2	75.49	10.64	13.99	0.29	2.18	0.02	0.04	0.01	0.13	18.85	155.01
TE 12-13	3.77	63.47	4.03	72.2	10.22	11.51	0.3	2.19	0.02	0.04	0.02	0.18	18.36	149.59
TE 13-14	3.87	66.26	4.46	82.5	10.56	11.41	0.3	2.14	0.02	0.11	0.01	0.14	19.22	162.57

Source: Department of Horticulture, Government of Karnataka; <http://www.horticulture.kar.nic.in/>

Table 3 represents ranks of districts as per total area, production and value of horticultural crops in Karnataka. District wise rank of total area under horticulture crops in Karnataka has been identified where; Tumkur stands on first rank with 11 percent area followed by Chikmangalore 6.6 percent area followed by Chitardurga, Hassan, D Kannada, Kolar, Davengree and Mandiya respectively. Least area under horticultural crops in Karnataka has been found in Yadgiri (0.35 percent area), Bangalore (U) (0.53), Raichur (0.76), Bidar, Gulberga and Koppal. Similarly district wise rank of total production of horticulture crops in Karnataka shows that Kolar stands on serial first with total 10.19 percentage of production, followed by Belgam on 2nd rank (6.76 percent), Haveri on 3rd rank (5.91 percent), followed by Bijapur, chitardurga, and the least share of horticulture production has been found in districts like Yadigiri last rank with 0.54 percent of production, followed by Kodagu (0.83 percent), Bangalore (U), Udupi and Raichur. The exchange earning from horticulture in the state of Karnataka is very high and the highest value for horticulture produce is in Tumkur district (9.8 percent) followed by Shimoga, Chitturdurga, Dharwad and Belgam and the least earnings earned from horticulture in the districts of Karnataka are: A Yadagiri, Bangalore (U), Koppal, Bidar Kodagu and Gulberga.

Table 4 presents the compound annual growth rate of area and yield of horticultural crops in Karnataka and their corresponding, 't' values that indicate the significance level of growth for different periods. Looking at the long term growth trends, area under almost all horticultural crops expanded in the decade of 1980s as well as 1990s. Area under fruits expanded at the rate of less than 3 percent per annum in the 1980s which further accelerated to 4.6 percent per annum in the 1990s. Similarly, area under vegetables increased at a rapid growth rate of 5 percent per annum in the 1980s and more than 6 percent in the 1990s. Area under commercial flowers expanded at a much faster rate of 9.6 percent in the 1980s and 7 percent in the 1990s. The area growth was relatively slow in the case of spices and plantation crops in which case area expanded at the rate of 2.6 percent per annum in the 1980s while area growth declined to above 1 percent per annum in the 1990s. Thus, overall horticultural crops area expanded by significant rate of around 3 percent per annum during the 1980s and slightly less than 3 percent per annum in the 1990s.

Against the impressive growth in area under horticultural crops in Karnataka in the decades of 1980s and 1990s, the yield growth rate of the same was either insignificant or it was even negative in most of the crops. The yield growth of fruit crops was insignificant but negative during the 1980s as well as 1990s. In the case of vegetables growth was insignificant but positive in the 1980s but negative and insignificant in the 1990s. The growth was positive but insignificant for spices and plantation crops in the 1980s and negative and significant in the 1990s thus indicating significant decline of yield of plantation crops in the 1990s. Only commercial flowers made the exception in whose case yield growth was found significant at 1.5 percent per annum in the 1990s while their yield was negative and insignificant in the 1980s. Overall, yield of horticultural crops increased by less than one percent in the 1980s but no increase in the 1990s.

In the present decade of 2000s, there was some reversal in area and yield growth rates. The fruits crops that had impressive growth rate in area during the 1980s and 1990s, observed negative but insignificant growth in area while had significant 1.7 percent growth in yield rate during the 2000s. Vegetables continued accelerating their area expansion in the 2000s as well, whereby area under vegetables expanded at even faster rate of 7 percent per annum. Their yield also experienced around 2.7 percent growth rate, albeit significant at 10 percent level. In the case of spices and commercial flowers, their area continued expanding at

Growth in Area, Production and Productivity of Horticultural Crops in Karnataka

the rate of 1.7 and 2.58 percent per annum, respectively but their yield growth rate was negative and insignificant. In the 2000s, medicinal and aromatic crops entered in the state at a commercial scale and their area jumped at a rate of 22 and 13 percent per annum, respectively. However, even these new entry crops failed in observing increase in their yield rate and over the whole period yield had a significant and very high negative growth rate, at least in the case of medicinal crops while negative yield growth in aromatic crops was not significant. At the overall, area under horticultural crops in Karnataka grew at an annual growth rate of 1.6 percent in the 2000s while yield increased at 1.9 percent whereby yield growth was not significant.

Table 3: Rank of Districts as per Total Area, Production and Value of Horticultural Crops in Karnataka State for the year 2013-14 (Area: Hectares, Production: M. Tons, Value: Rs in Lakhs)

Districts	Area	% Area	Rank	Districts	Production	% Production	Rank	Districts	Value	% Value	Rank
Tumkur	212689	11.06	1	Kolar	1656153	10.19	1	Tumkur	345877	9.8	1
Chikmanglore	127205	6.62	2	Belgam	1098275	6.76	2	Shimoga	248969	7.05	2
Chitradurga	124905	6.5	3	Haveri	960270	5.91	3	Chitradurga	227444	6.44	3
Hassan	122998	6.4	4	Bijapura	876154	5.39	4	Dharwad	220694	6.25	4
D. Kannada	110331	5.74	5	Chitradurga	840596	5.17	5	Belgaum	216170	6.12	5
Kolar	108883	5.66	6	Bellary	715277	4.4	6	Kolar	176095	4.99	6
Davangere	82188	4.28	7	Gadag	700465	4.31	7	Haveri	168130	4.76	7
Mandya	78732	4.1	8	Dharwad	695398	4.28	8	Davangere	167022	4.73	8
Shimoga	78584	4.09	9	Mandya	662260	4.07	9	Chikmagalore	163769	4.64	9
Dharwad	75002	3.9	10	Chamarajanagar	656678	4.04	10	U.Kannada	154843	4.39	10
Belgaum	73263	3.81	11	Chikmagalore	649507	4	11	Hassan	138656	3.93	11
Haveri	70119	3.65	12	Hassan	617318	3.8	12	Ramanagara	117633	3.33	12
Ramanagara	59658	3.1	13	Chikkaballapur	580751	3.57	13	Bellary	111586	3.16	13
Mysore	58816	3.06	14	Tumkur	577620	3.55	14	D. Kannada	110398	3.13	14
Bellary	56477	2.94	15	Mysore	530180	3.26	15	Mysore	100563	2.85	15
Gadag	56086	2.92	16	Bagalkote	524981	3.23	16	Bijapura	98098	2.78	16
Udupi	51963	2.7	17	Davangere	459583	2.83	17	Mandya	91526	2.59	17
Chamarajanagar	49999	2.6	18	Shimoga	455059	2.8	18	Chamarajanagar	83454	2.36	18
Chikkaballapura	47075	2.45	19	Koppal	422552	2.6	19	Udupi	81638	2.31	19
Bijapura	46066	2.4	20	Ramanagara	413596	2.54	20	Bagalkote	67396	1.91	20
U.Kannada	38207	1.99	21	Gulberga	353021	2.17	21	Raichur	66679	1.89	21
Bagalkote	33974	1.77	22	B'lore (R)	341051	2.1	22	Gadag	65213	1.85	22
Kodagu	33562	1.75	23	Bidar	268752	1.65	23	Chikkaballapura	63476	1.8	23
B'lore (R)	26642	1.39	24	U.Kannada	255110	1.57	24	B'lore (R)	54353	1.54	24
Koppal	24207	1.26	25	D. Kannada	222197	1.37	25	Gulberga	39465	1.12	25
Gulberga	21788	1.13	26	Raichur	201066	1.24	26	Kodagu	39036	1.11	26
Bidar	21297	1.11	27	Udupi	165876	1.02	27	Bidar	37077	1.05	27
Raichur	14573	0.76	28	B'lore (U)	134869	0.83	28	Koppal	36813	1.04	28
B'lore (U)	10280	0.53	29	Kodagu	134248	0.83	29	B'lore (U)	28577	0.81	29
Yadagiri	6730	0.35	30	A Yadagiri	87931	0.54	30	A Yadagiri	10040	0.28	30
State Total	1922299	100		State Total	16256793	100		State Total	3530691	100	

Source: Department of Horticulture, Government of Karnataka; <http://www.horticulture.kar.nic.in/>

Growth in Area, Production and Productivity of Horticultural Crops in Karnataka

Table 4: Growth rate in area and yield rate of horticultural crops in Karnataka (%)

Period	Fruits		Vegetables		Spices, garden & plantation		Commercial Flowers		Medicinal		Aromatic		Total	
	Area	Yield	Area	Yield	Area	Yield	Area	Yield	Area	Yield	Area	Yield	Area	Yield
1980-81 to 1990-91*	2.95	-0.03	5.18	0.17	2.63	0.37	9.58	-0.04	-	-	-	-	2.96	0.82
	(22.3)	-(0.1)	(12.0)	(0.6)	(7.7)	(1.9)	(21.2)	-(0.2)	-	-	-	-	(22.0)	(2.6)
1990-91 to 2000-01*	4.57	-0.51	6.31	-1.92	1.16	-3.21	6.95	1.47	-	-	-	-	2.77	0.36
	(14.6)	-(1.0)	(13.9)	-(1.4)	(3.2)	-(4.7)	(12.2)	(4.9)	-	-	-	-	(12.7)	(0.5)
2000-01 to 2008-09*	-0.61	1.74	7.00	2.69	1.67	-1.86	2.84	-1.34	22.42	-18.54	13.25	-7.97	1.55	1.89
	-(0.5)	(5.6)	(3.3)	(1.9)	(12.6)	-(0.9)	(2.8)	-(0.6)	(9.3)	-(2.9)	(4.8)	-(0.6)	(6.3)	(1.7)
1980-81 to 2008-09*	2.43	0.19	4.67	-0.29	1.44	-3.13	6.07	1.06	-	-	-	-	2.29	0.56
	(9.7)	(1.8)	(20.4)	-(0.9)	(15.2)	-(8.9)	(16.0)	(4.6)	-	-	-	-	(29.6)	(2.7)
2000-01-to 2004-05**	-4.51	1.12	5.47	-4.14	1.93	-9.33	-1.76	5.34	10.53	-14.32	20.76	122.22	0.79	-4.12
2004-05 to 2005-06**	0.38	2.18	3.32	13.15	0.92	3.55	4.05	-32.32	27.36	-23.18	13.97	168.21	1.44	7.89
2005-06 to 2006-07**	4.71	2.56	4.26	13.92	3.30	5.96	8.11	6.62	19.33	-4.66	-26.14	-26.42	3.81	9.10
2006-07 to 2007-08**	5.63	1.30	4.76	11.05	0.88	-0.91	7.21	5.17	35.20	24.19	31.30	6.61	2.65	8.37
2007-08 to 2008-09**	7.18	1.18	1.41	-1.13	2.17	1.20	9.08	32.74	47.93	-39.61	52.32	11.39	2.93	0.62
2008-09-to 2009-10**	2.54	2.37	3.79	13.54	2.11	4.75	6.08	-12.85	23.34	-13.92	-6.09	70.89	2.63	8.49
2010-11-to 2011-12**	3.57	2.01	4.11	12.71	1.70	2.86	6.46	-6.84	27.30	-1.22	6.38	49.47	2.64	8.45
2012-13-to 2013-14**	4.48	1.80	3.44	9.25	1.82	2.45	7.11	3.05	32.45	-10.82	17.86	39.95	2.71	6.49

Source: Author calculation based data from Department of Horticulture, Government of Karnataka; <http://www.horticulture.kar.nic.in/>

Note: *Decadal growth rate ** Growth rates are bases on annual averages

Conclusion

There has been a declining trend in cultivable area in Karnataka because of increasing non-agricultural uses of land. On the other hand, on account of expansion in area under fruits, vegetables and commercial flowers, overall area under horticultural crops in Karnataka has increased persistently in the recent past. Area under horticultural crops expanded by significant rate of around 3 percent per annum, during the 1980s and slightly less than 3 percent per annum, in the 1990s. However, against the impressive growth in area in the decades of 1980s and 1990s, the yield growth rate of the same was either insignificant or it was negative in many crops. Only commercial flowers made exception in whose case yield growth was found significant at 1.5 percent per annum in the 1990s. Overall, yield of horticultural crops increased by less than one percent in the 1980s but no increase in the 1990s. In the decade of 2000s, there was some reversal in area and yield growth rates. At the overall, area under horticultural crops in Karnataka grew at an annual growth rate of 1.6 percent in the 2000s while yield increased at 1.9 percent.

References

- Acharya S., Basavaraja H., Kunnal L. B., Mahajanashetti S. B., and Bhat A. R. S. (2012) "Growth in area, production and productivity of major crops in Karnataka" *Karnataka J. Agric. Sci.*, 25 (4) : (431-436)
- Chadha, K.L. (2011), "Handbook of Horticulture" Directorate of Knowledge Management in Agriculture, Indian Council of Agricultural Research, Krishi Anusandhan Bhawan, Pusa, New Delhi
- Department of Horticulture Government of Karnataka, website: <http://www.horticulture.kar.nic.in/>
- Economic Survey of Karnataka 2014-15, Planning, Programme Monitoring & Statistics Department
- Economic Survey of Karnataka 2015-16, Planning, Programme Monitoring & Statistics Department
- Mittal, S. (2007). Can Horticulture be a Success Story for India? Working Paper No. 197, Indian Council for Research on International Economic Relations, New Delhi, India
- National Horticulture Mission Karnataka, website: http://www.horticulture.kar.nic.in/NHM%20Action%20plan_05-06.htm
- Singha Komol, Choudhary Rohi, and Vishnu Kedar (2014) "Growth and Diversification of Horticulture Crops in Karnataka: An Inter-District Analysis" *SAGE Open* DOI: 10.1177/2158244014548018, sgo.sagepub.com
- www.raitamitra.kar.nic.in/ENG/statistics.asp