

Agricultural Profile of Karnataka State



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Introduction:

The history of Indian agriculture dates back to 10,000 years. Indian agriculture began during 9000 BC as a result of early cultivation of plants and domestication of crops and animals. The middle ages in India saw irrigation channels that reached a new level of sophistication. Land and water management systems were developed with the objective of providing uniform growth. The agricultural sector employed 60 per cent of the total workforce in India, and despite a steady decline of its share in the GDP, it still remains the largest economic sector. Agriculture plays a significant role in the overall socio-economic development of India.

Karnataka is India's eighth largest state in geographical area covering 1.92 lakh sq km and accounting for 6.3 per cent of the geographical area of the country. The state is delineated into 30 districts and 176 taluks spread over 27,481 villages. In Karnataka, agriculture is the major occupation for a majority of the rural population. As per the population Census 2011, agriculture supports 13.74 million workers, of which 23.61 per cent are cultivators and 25.67 per cent agricultural workers. A total of 123,100 km² of land is cultivated in Karnataka constituting 64.6% of the total geographical area of the state. The agricultural sector of Karnataka is characterized by vast steppes of drought-prone region and sporadic patches of irrigated area. Thus, a large portion of agricultural land in the state is exposed to the vagaries of monsoon with severe agro-climatic and resource constraints. Agriculture employs more than 60 per cent of Karnataka's workforce.

Agriculture in Karnataka is heavily dependent on the southwest monsoon. While only 26.5 per cent of the sown area (30,900 km²) is under irrigation, 64.60 per cent of the total geographical area is under cultivation. The state ranks fifth in India in terms of total area under horticulture. It stands fifth in production of vegetable crops and third in fruit crop production. It is also the largest producer of spices, aromatic and medicinal crops and tropical fruits. It is the second largest milk-producing state after Gujarat. Karnataka is also the second largest producer of grapes in the country, and accounts for the

production of 12 per cent of total fruits, 8 per cent of total vegetables and 70 per cent of coffee in the country. It is the third largest producer of sugar and ranks fourth in sugarcane production. In floriculture, Karnataka occupies the second position in India. Karnataka is the major silk producing state in the country http://en.wikipedia.org/wiki/Economy_of_Karnataka - [cite note-stats-8#cite note-stats-8\(http://www.advantagekarnataka.com/images/pdf/Doing-Businessin-Kar.pdf\)](http://www.advantagekarnataka.com/images/pdf/Doing-Businessin-Kar.pdf). It has a coastline of 320 km and yields an annual marine production of 425,000 MT with 276 varieties of fishes. Karnataka leads in the export of silk in India with an approximate share of 25 per cent of the total Indian export market.

Agriculture plays an important role in the overall growth of Karnataka's economy despite a fall in its share in the state domestic product. In Karnataka, horticulture crops occupy about 15.21 lakh hectares with an annual production of about 96.60 lakh tonnes. Karnataka is highly progressive with regard to vegetable production, and enjoys this advantage because of favourable climatic conditions without any extremes in temperature. It is also well known for floriculture production and is a major silk-producing state in the country. The fisheries sector is now emerging as one of the most important in allied agriculture activities in the state.

Agriculture remains the primary activity and main source of livelihood for the rural population in the state. It is characterized by wide crop diversification and remains highly dependent on the vagaries of the southwest monsoon. During 2010-11, foodgrain production in the state increased at an enormous rate of more than 14% over the previous year and this increase was mainly led by an increase in yield as the area increase during the year was only 2.9 per cent. Agriculture contributed 15.94 per cent (at constant prices) to the state's GSDP in 2011-12. There has been a decline in GSDP generated from the agricultural sector and consequently, the SDP per worker in the sector has been declining at a faster rate in the recent past when compared to the last decade.

Agricultural growth rate (constant prices 2004-05) has fluctuated from a low of -2.8 per cent during 2006-07 (over 2005-06) to a high of 13.3 per cent in 2010-11 (over 2009-10) and again down to -2.9 per cent in 2011-12. Although per capita income has shown considerable increase owing to the growth in manufacturing and service sectors, the per capita GSDP in rural areas from agricultural activities remains low and hence the inter-

sectoral inequalities are growing sharply. A large number of workers depend on agriculture relative to the output it generates, resulting in lower labour productivity compared to non-agricultural sectors. Less than one-fifth of the SDP comes from more than 50 per cent of the workforce in the state. This has serious implications for improving the welfare of rural population and alleviation of poverty.

2. SOILS

- There are varied types of soils in Karnataka. Six broad groups of soil orders are recognized, based on differences in soil formation processes, as reflected in the nature and sequence of soil horizons. Black soils are found in northern Karnataka whereas red and red loamy soils are prominent in southern Karnataka. Laterite soils are found in malnad and coastal areas of the state (Table 1). A brief description of the properties of these soil groups, along with their distribution across districts of Karnataka, is presented below as well as depicted in Fig 1.

Talking about the **soils in Karnataka**, we can summarize the following points:

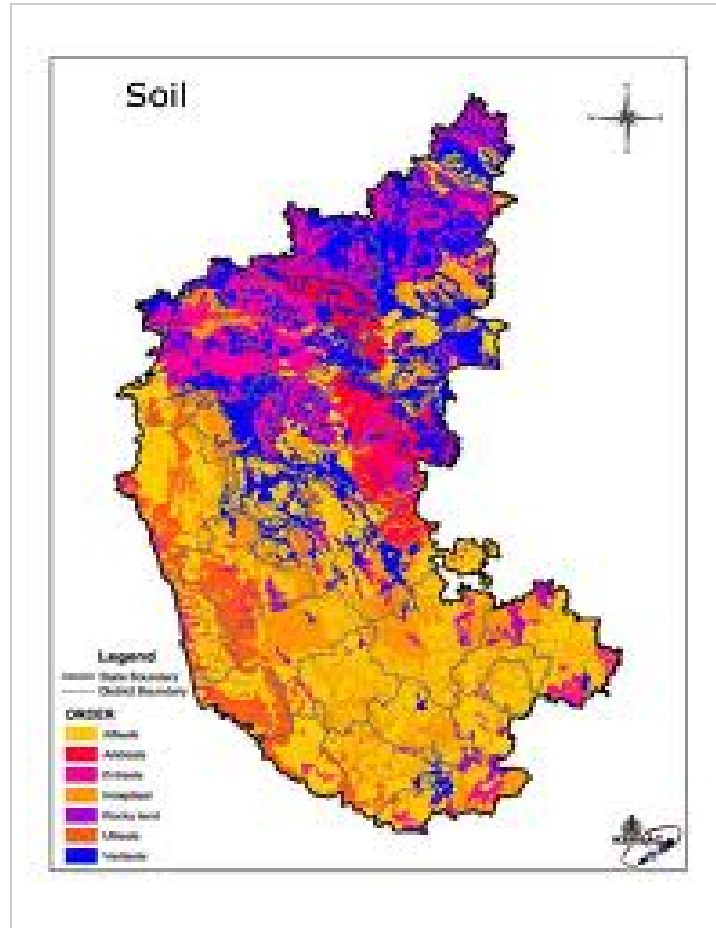
- **Black soils:** These soils are derived from basalt, though some are formed from limestones, shales, alluvium and schists. These soils have high plasticity, stickiness and tendency to swell and shrink when subjected to wetting and drying cycles. They have high water holding capacity with low bulk density.
- **Red soils:** These form the most widespread soil type in Karnataka. The red soil results from the weathering of the crystalline and metamorphic rocks and its red color comes from the diffusion of iron oxide in high proportions.
- **Red loam soils:** These are generally deep to very deep and the clay content can vary. The soils are subject to intense leaching. They are fairly well drained in the uplands and water logged in low-lying areas.

Mixed red and black soils: The coarse textured red **soils** with high permeability are found in upland areas whereas deep, clayey, poorly drained black soils occur in the low lands and valleys. The topography and parent material are the major soil forming factors under the influence of which these mixed red and black soils are formed. These are derived from either gneisses or schists rocks or sedimentary rock formations. **Table 1: Soils of Karnataka**

SOIL NAME	PROPERTIES	DISTRIBUTION
(1) Black soil	In texture, soil varies from loam to clays. Generally they are neutral to alkaline in reaction, calcareous and well supplied with bases such as Ca, Mg, K. Black soils are known to get self ploughed due to their swelling and shrinking properties with changes in moisture content.	Districts are Belgaum, Bijapur, Gulbarga and Bidar; also parts of Raichur, Chitradurga and Bellary
(2) Laterite soil	Laterite soils result from advanced stages of weathering; highly leached, they are poor in bases and very acidic in reaction. The moisture retentivity of the soil is very poor; soil contains adequate quantities of organic matter.	Malnad and coastal areas of U.K, D.K and parts of Dharwad, Chikmagalur, Hassan
(3) Red and red loamy soil	They are light textured, from sandy to gravelled or loamy, with poor aggregating ability. They are poor in bases and acidic to neutral in reaction.	Shimoga, Chikmagalur, Hassan, Mysore and Kodagu.
(4) Coastal alluvials	The surface soil is generally grey, yellow or light brown; the intensity of the colour increases with depth. The soils are acidic in nature, low in cation exchange capacity and bases.	Dakshin Kannada, and Uttar Kannada
(5) Dark brown clayey soil	They are clayey, low in bases, rich in organic matter as the surface soil receives the decomposition product of the virgin forest	Dakshin Kannada, Uttar Kannada, Kodagu & Mysore
(6) Mixed red and black soil	Black soil seen in the low lands and valleys has properties resembling those of medium black soil. Soils are productive under good management practices.	Belgaum, Bijapur, Dharwad, Raichur, Bellary and Chitradurga.

Source: <http://raitamitra.kar.nic.in/agriprofile/table5.htm>

Fig. 1



3. Land-use Pattern

Land is a finite resource and its demand for diverse purposes is increasing day by day. There are large areas of utilizable but wasteland resources. Moreover, the pressure of commercialization is increasingly forcing out productive land resources for non-agricultural uses. Considering the importance of land use and policy, the Government of Karnataka brought out a document on land use policy recently (GoK, 2003).

The analysis of land use data from 1966 to 2009 indicates structural changes in land use pattern. Areas under permanent pasture decreased consistently and areas under non-agricultural uses increased sharply during the past four decades. Fallow land, which was

around 11 lakh ha, increased to 13.50 lakh ha after mid-nineties (Table 2). Fallow land area fluctuates from year to year; in certain years (like 1998-99, 1990-2000, 2001-02, 2006-07 and 2008-09), the percentage reached above 10 per cent of the total (190.50 lakh ha) geographical area of the state. This was mainly because of deficient rainfall and the inability of the government to provide irrigation facilities in those years. The net sown area also started shrinking after 1990s. The net sown area, which accounted for 55.776 per cent of the total geographical area of the state in the triennium ending 1988, declined to 54.28 per cent during the triennium 2007-09. The interpretation of this data is difficult due to many factors like illegal encroachments and changing land use due to population pressure and market forces (GOI, 2004).

Table 2: Area under various land use categories

Area in lakh hectares

<i>Land use category</i>	<i>Triennium Ending with</i>				
	<i>1967-68</i>	<i>1977-78</i>	<i>1987-88</i>	<i>1997-98</i>	<i>2010-11</i>
<i>Non-Agr. Purposes</i>	8.76	10.36	11.72	12.88	13.97
<i>Permanent Pastures</i>	16.76	14.49	11.32	10.03	9.16
<i>Current Fallows</i>	10.65	13.05	10.90	13.59	13.33
<i>Net Sown Area</i>	100.67	99.40	106.21	104.01	103.67
<i>Gross Irrigated Area</i>	12.97	17.16	23.83	29.70	40.94

In future, land demand for non-agricultural purposes is going to increase. Area used for non-agricultural purposes mainly includes land under urban areas, land used for infrastructure projects, dams and irrigation systems, industries and special economic zones and mines and quarries (KSLUB, 2001). The Perspective Land Use Plan for Karnataka - 2025, published by the State Land Use Board, GoK in 2001, presents the projected land use plan under various land use categories for Karnataka up to the year 2025. It lists the current area and projected demand for non-agricultural purposes in Karnataka (Table 3). It is being felt that these estimates are low as they do not include the proposed SEZs, urban infrastructure projects, airports etc., which need the land

converted from agriculture. Even these estimates project that more than 220,000 hectares of land has to be found for non-agricultural purposes.

Table 3: Current and Estimated Demand of Land for Non-agricultural Purposes

Area in '000 ha

Category	2001	2025
Towns	427	567
Mining	65	68
Industries	18	39
Roads	88	132
Railways*	16	16
Power	81	93
Irrigation (submerged)	195	195
Total	890	1110

* Estimated projections for railways and irrigation not available.

Source: Karnataka State Land Use Board (KSLUB, 2001): "Perspective Land Use Plan for Karnataka 2025" Government of Karnataka, Bangalore.

4. Rainfall

Rainfall plays an important role in crop production in Karnataka as more than 70 per cent of the cropped area is rain-fed. There are 1,256 rain gauge stations in the state of which 1,170 are functioning and 86 are non-functional. The long-term (1901-1970) annual average rainfall in the state, which was 1,339 mm, has declined to an average precipitation of 1,217 mm during the years 1941-1990. The average rainfall between 1998 and 2008 indicated increased precipitation during summer and south-west monsoon season and modest reduction during the north-east monsoon season (Table 4). Variability in precipitation ranged from 26 per cent for north-east monsoon to 173 per cent for summer months. The actual rainfall received during south-west monsoon (June-September) as well as north-east monsoon (October – December) during 2010 is higher

than the normal precipitation in the state. The total rainfall was 1,500 mm, which is 303 mm or 25 per cent more than the normal rainfall of 1,198 mm.

Table 4: Season-wise Normal and Average Rainfall (in mm)

Period	Normal Rainfall (1941-1990)	Average rainfall (1998 to 2008)	CV (%) (1998 to 2008)	Average rainfall 2010
Summer (Jan.-Mar.)	13	24.6	173	15
Pre-monsoon (Apr.-May)	131	124.9	42	126
Southwest monsoon (June-Sept.)	861	934.5	28	1064
Northeast monsoon (Oct.-Dec.)	193	177.0	26	295
Annual Total	1198	1261	21	1500

As stated earlier, Karnataka has varied agro-climatic conditions ranging from large semi-arid regions to coastal and rain-shadow areas. The average annual rainfall for 1998 to 2010 ranged from a minimum of 547 mm in Bijapur to a maximum of 4,471 mm in Udupi district. The districts located in southern and coastal parts of the state viz., Shimoga, Chickmagalur, Kodagu, Uttar Kannada, Dakshin Kannada and Udupi, received an average annual rainfall of more than 2,000 mm. On the contrary, districts like Bijapur, Bellary, Bagalkot, Koppal, Gadag, Raichur and Chitradurga can be classified as low rainfall districts where average annual rainfall (1998-2010) is less than 650 mm. The normal rainy days varied from less than 40 in low rainfall districts to more than 80 in high rainfall districts (Table 5). The variability in annual average precipitation measured in terms of coefficient of variation (CV) was lower in the districts having high rainfall than in the

districts having lower annual rainfall. The CV in annual rainfall ranged from 11 per cent in Dakshin Kannada to 31 per cent in Bagalkot district.

Table 5: Normal and Actual Rainfall (Triennium Average) by Districts in Karnataka

<i>District</i>	Normal Rainfall	Normal Rainy days	Triennium Average Annual Rainfall					CV (%) 1998-2010
			1998-2000	2001-2003	2004-06	2007-2009	1998-2010	
<i>Bagalkot</i>	584	40	634	377	489	689	554	31
<i>Bangalore (R)</i>	740	41	893	571	766	792	756	25
<i>Bangalore (U)</i>	835	49	1001	604	895	921	855	26
<i>Belgaum</i>	842	53	899	630	1010	1023	901	20
<i>Bellary</i>	604	40	566	422	524	648	550	23
<i>Bidar</i>	886	49	893	730	799	749	812	16
<i>Bijapur</i>	632	40	583	405	511	668	547	30
<i>Chamarajanagar</i>	730	43	930	673	948	831	936	24
<i>Chikamagalur</i>	2073	87	2362	1777	2445	2690	2321	16
<i>Chitradurga</i>	495	31	586	422	602	722	607	27
<i>Dakshina Kannada</i>	3519	117	4161	3568	3978	4008	3969	11
<i>Davanagere</i>	623	43	638	471	657	832	678	28
<i>Dharwad</i>	787	58	679	474	702	793	676	23
<i>Gadag</i>	631	43	586	417	545	758	587	26
<i>Gulbarga</i>	839	45	765	548	649	723	690	21
<i>Hassan</i>	1148	58	1137	836	1348	1347	1186	21
<i>Haveri</i>	782	61	730	529	730	908	751	24
<i>Kodagu</i>	2692	111	2806	2292	3251	2953	2814	17
<i>Kolar</i>	614	32	675	546	699	819	696	26
<i>Koppal</i>	587	36	602	417	470	736	571	30
<i>Mandya</i>	648	37	816	572	801	696	732	24
<i>Mysore</i>	730	47	894	631	804	721	769	18
<i>Raichur</i>	654	37	664	473	540	663	590	25
<i>Shimoga</i>	2421	89	2452	1764	2407	2582	2308	15
<i>Tumkur</i>	585	32	716	484	630	707	650	22
<i>Udupi</i>	4252	121	4783	4002	4250	4667	4471	12

Uttara Kannada	2887	103	3307	2552	3198	3296	3107	14
Ramanagara	809	46	1011	582	853	785	807	25
Chikkaballapur	677	37	718	582	772	757	725	26
Yadgir	839	45	758	504	621	716	661	27
Karnataka	1198	56	1275	972	1230	1307	1209	14

Source: DES, Government of Karnataka

5. Land Holding

It is interesting to note that the number of small and marginal holdings as well as their share in the total operated area is increasing over the years. The increase in small and marginal holdings and area operated became more conspicuous after 2000-01 (Table 6). Small and marginal farmers (operating < 2 ha) account for 76 per cent of the holdings and share roughly 37 per cent of the operated area in Karnataka. The average size of operated area of all the land size classes is declining. This clearly indicates the increasing fragmentation of land holdings in the state.

Table 6: Number Holdings and Area Operated under Different Farm Sizes

Number of holdings and Area in %

Years	< 1 ha	1 to 2 ha	2 to 4 ha	4 to 10 ha	10 & Above	Total holdings & Area in '000'
Number of Holdings						
1970-71	30.44	23.66	22.19	17.54	6.17	3551
1980-81	34.56	24.53	21.30	15.36	4.25	4309
1990-91	39.16	27.46	20.14	11.01	2.23	5776
200-01	45.94	26.97	17.78	8.04	1.27	7079
2005-06	48.23	26.55	16.86	7.31	1.06	7581
Area Operated						
	< 1	1 to 2	2 to 4	4 to 10	10 & Above	
1970-71	4.83	10.74	19.40	33.36	31.68	11368
1980-81	6.24	13.14	21.90	34.21	24.52	11746
1990-91	8.70	18.73	25.97	30.60	16.00	12321
200-01	12.12	22.28	27.86	26.95	10.78	12307

2005-06	13.34	23.22	28.00	25.89	9.55	12385
Average Operated Area per holding in ha						
1970-71	0.51	1.46	2.8	6.09	16.43	3.2
1980-81	0.49	1.46	2.8	6.07	15.69	2.73
1990-91	0.47	1.46	2.75	5.93	15.28	2.13
200-01	0.46	1.44	2.72	5.83	14.74	1.74
2005-06	0.45	1.43	2.71	5.79	14.79	1.63

The shrinking sizes of holdings and the high proportion of unviable farmers impinge upon the quality of life. The economic unviability of a large number of small and marginal holdings and the hardship faced by their holders are reflected in the growing number of suicides committed by farmers. This calls for initiating a new phase of land reforms, especially policies related to land tenancy.

6. Population and Workforce

The population of Karnataka which was 5.29 crore in 2001 has increased to 6.11 crore in 2011. The female population of Karnataka which accounted for 49.10 per cent of the total population in the state during the 2001 census has gone up marginally to 49.19 per cent in the 2011 census. The total population growth in this decade was 15.67 per cent while in the previous decade it was 17.25 per cent. The population of Karnataka forms 5.05 per cent of the all-India population in 2011 as against 5.14 per cent during the 2001 census. Rural population which formed 66 per cent of the total population of Karnataka in 2001 declined to 61.43 per cent in 2011 (Table 7). The proportion of rural female population declined from 49.41 per cent in 2001 to 49.19 per cent in 2011. On the contrary, the proportion of female population in urban Karnataka rose marginally from 48.50 per cent in 2001 to 48.91 during 2011.

Table 7: Population of Karnataka during 2001 and 2011 Census

Population in '000'

Population	Census 2011			Census 2001		
	Total	Rural	Urban	Total	Rural	Urban
Persons	61,095	37,469	23,626	52,851	34,889	17,962
Males	30,967	18,929	12,037	26,899	17,649	9,250

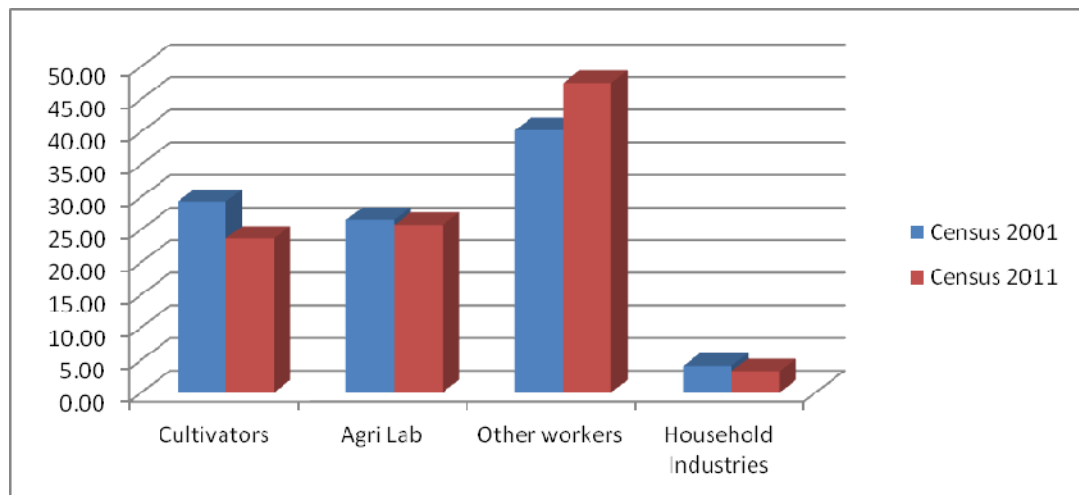
Females	30,129	18,540	11,589	25,952	17,240	8,712
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Source: Karnataka Census, 2011

Workforce:

According to the 2001 census, workers constituted 44.53 per cent of the total population and the rest 55.47 per cent were non-workers. There were 2.35 crore main workers accounting for roughly 37 per cent of the total population as per the 2001 census. The cultivators (29.25 per cent) and agricultural labourers (26.46 per cent) formed 56 per cent of the workforce of Karnataka (Fig.2). Workers in the household industry accounted for 4 per cent whereas other workers constituted 40.21 per cent of the total workers in Karnataka in 2001. As per the 2011 census, 2.79 crore people accounting for 45.62 per cent of the population form the workforce and among these, cultivators accounted for 21.66 per cent and agriculture labour constituted 18.37 per cent in the state. It is interesting to note that the share of both cultivators as well as agricultural workers has declined in 2011 from the 2001 census figures.

Fig. 2: Changing Proportion of Workers in Karnataka



7. Irrigation

Irrigation plays an important role in improving production and productivity of agriculture. It facilitates adoption of improved technologies and increases cropping intensity thereby

making optimum use of a finite resource i.e., land. There has been a gradual increase in the irrigated area in the state. The gross irrigated area has increased steadily from 9.06 lakh ha during 1960-63 to 27.45 lakh ha during 1990-93 and touched 41.87 lakh ha for the triennium ending 2008-11 (Table 8). The net irrigated area is 34.90 lakh ha at the triennium ending 2008-11 when compared with 22.05 lakh ha during 1990-93.

Table 8: Source of Irrigation (Triennium Averages)

Area in Lakh ha

Triennium	Canal	Tanks	Tube Wells	Wells	Other Sources	Net Irrigated Area	Gross Irrigated Area
1960-63	2.56 (28.28)*	3.58 (39.49)	0.00 (0.00)	1.46 (16.11)	1.46 (16.12)	9.06 (100.00)	9.96
1970-73	4.38 (35.91)	3.67 (30.07)	0.04 (0.30)	3.11 (25.51)	1.00 (8.21)	12.20 (100.00)	15.02
1980-83	6.11 (40.49)	3.17 (21.02)	0.07 (0.48)	4.02 (26.68)	1.71 (11.33)	15.08 (100.00)	18.59
1990-93	8.94 (40.55)	2.65 (12.00)	2.11 (9.57)	5.32 (24.12)	3.04 (13.76)	22.05 (100.00)	27.45
2000-03	8.81 (34.50)	2.29 (8.97)	6.17 (24.16)	4.69 (18.37)	3.57 (13.99)	25.53 (100.00)	30.67
2004-07	10.11 (34.73)	1.86 (6.40)	9.36 (32.13)	3.93 (13.51)	3.86 (13.24)	29.12 (100.00)	35.21
2008-11	11.08 (32.84)	1.99 (5.92)	12.24 (36.29)	4.23 (12.53)	4.19 (12.40)	34.90 (100)	41.87

*Note: * Figures in parenthesis are percentage to NIA*

Among the irrigation sources, canals and tanks were the major sources of irrigation till 1980s. However, the share of tube/bore wells in the total irrigated area started increasing phenomenally after early 1990s. In 2008-11, the net area irrigated by tube/bore wells accounted for 36.29 per cent of the total net irrigated area in Karnataka as against 32.84 per cent covered by canal irrigation.

8. Cropping Pattern

The cropping pattern of the region is influenced not only by agro-climatic conditions like rainfall, soil, temperature, etc., but also by government policies and programmes for crop production in the form of subsidies, support prices, tariffs and speed of infrastructure development. The overall trends in area allotted for various crops during five decades show that cropping pattern in Karnataka is dominated by food crops, with a share of more than 60 per cent of the gross cropped area in the state. Rice, sorghum and finger millet were the major cereals till 2000-03. However, the share of maize crop went up substantially after 2005 due to improved productivity and prices. The area under food crops declined from 79.1 per cent in the 1960-63 triennium to 59.4 per cent of the GCA in 1990-93. The area under cereals declined from 60 per cent in 1960-63 to 43 per cent of the GCA in 2007-08 (Table 9 and Fig 3). Acreages of millet crops like sorghum and pearl millet and minor millets declined consistently. The reduction in the share of cereals was due to shrinkage in the area devoted to millets. Area under pulses which stood at 11 per cent during the early seventies increased to 18.3 per cent in 2007-10.

Table 9: Changes in Cropping Pattern (Triennium Averages)

Percent share in GCA

<i>Crop</i>	<i>1960-63</i>	<i>1970-73</i>	<i>1980-83</i>	<i>1990-93</i>	<i>2000-03</i>	<i>2007-10</i>
<i>Rice</i>	9.9	10.7	10.3	10.3	11.4	11.6
<i>Sorghum</i>	28.0	21.8	19.2	18.0	15.1	10.9
<i>Pearl millet</i>	4.8	4.6	5.4	3.3	2.7	2.6
<i>Maize</i>	0.1	0.7	1.4	2.3	5.3	9.0
<i>Finger millet</i>	9.6	9.8	9.8	8.8	7.7	6.4
<i>Wheat</i>	2.9	2.9	3.0	1.7	2.2	2.2
<i>Small millets</i>	4.2	4.1	3.2	1.1	0.6	0.3
<i>Total Cereals</i>	59.7	55.4	52.4	45.5	45.0	43.1
<i>Pigeon pea</i>	2.7	2.5	3.3	3.9	4.4	5.0
<i>Chick pea</i>	2.5	1.4	1.3	1.7	3.7	6.1
<i>Total Pulses</i>	11.9	11.0	13.2	13.8	16.9	18.3
<i>Food grains</i>	71.9	68.3	66.6	59.4	61.9	61.4
<i>Groundnut</i>	8.4	9.2	7.6	10.5	7.8	6.8

<i>Sunflower</i>	-	-	1.0	8.6	5.5	7.4
<i>Total oilseeds</i>	9.7	11.0	12.2	22.7	15.9	17.0
<i>Cotton</i>	9.3	10.2	9.0	5.0	4.4	3.3
<i>Sugarcane</i>	0.7	1.0	1.6	2.2	3.4	2.4
<i>Others*</i>	8.7	11.4	11.6	10.8	14.4	15.8
<i>GCA</i>	100	100	100	100	100	100

Note: Include tobacco, fruits and nuts, vegetables, coconut, arecanut, chillies and coffee

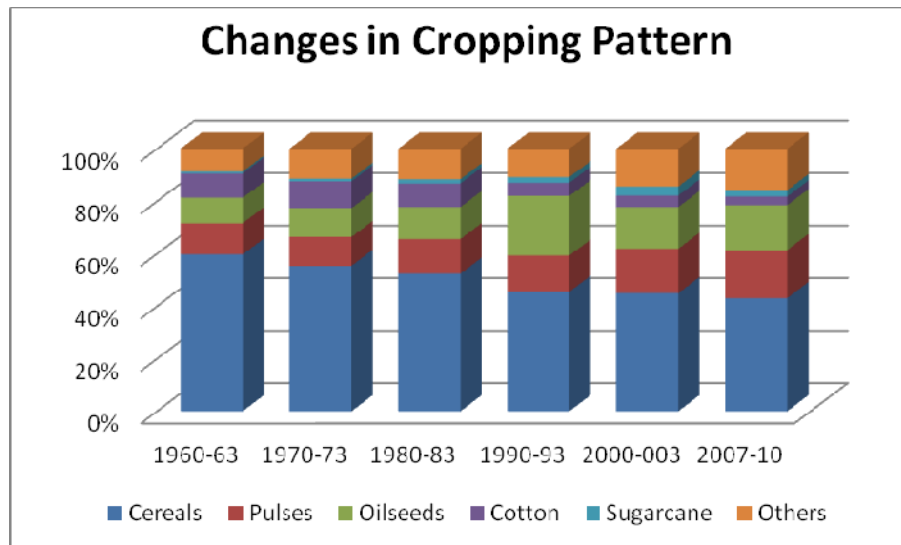
Source: Statistical Abstracts of Karnataka (various issues), Government of Karnataka

Oilseeds grew their share from around 10 to 11 per cent during the sixties and seventies to more than 20 per cent in early 1990s and it was 17 per cent of the GCA in 2007-10. The Technology Mission on Oilseeds introduced in the mid-eighties conditioned the expansion of area under oilseeds. Cotton occupied 9 per cent of the GCA in early 1980s but came down gradually to little more than 3 per cent of the GCA in 2007-10. Area under chickpea hovered around 1.5 per cent of the GCA between 1970s and 1990s, but rose to 6.1 per cent in 2007-10.

Similarly area under pigeon pea increased from 2.5 per cent in 1970-73 to 5 per cent in 2007-10. The area under other crops, which include fruits, vegetables and plantation crops, increased gradually from 11.4 per cent of GCA in the early seventies to 15.8 per cent in 2007-10.

Karnataka has a varied topographical character ranging from coastal plains to gentle slopes and the heights of the Western Ghats. The State is delineated into 4 sub-regions viz., 1. northern dry region, 2. central region, 3. southern region and 4. hills and coastal region. In the northern dry region, sorghum is the lead crop dominating the cropping system followed by cotton and pigeon pea. Maize and sugarcane are also important crops there. In the central region, ragi-based cropping system is predominant.

Fig. 3



In the hills and coastal region, the cropping system is rice based and there are some pockets in this region where ragi also forms an important component of the cropping system along with rice. The northern dry and central regions are the major producers of oilseeds. Groundnut is cultivated in the central region whereas sunflower and soybeans are popular in the northern dry region. Cotton, pigeon pea and other pulses are planted during kharif and sorghum is grown on residual moisture during rabi season on black cotton soils in the northern dry region. As expected, mixed or inter-cropping is practised more in the northern and central regions than in the southern region. Rice-rice rotations are common in irrigated areas of southern as well as coastal and hill regions. Sugarcane is grown in sizable areas in all the regions using canal irrigation. Sericulture is an important activity in the southern region and large areas are under mulberry cultivation. Coconut, arecanut, mango, grapes, sapota, citrus, etc. are the important fruit crops grown in the state. Karnataka is endowed with varied climatic conditions and has good potential for the development of horticulture and floriculture, which needs to be exploited for domestic and export markets. (*Kumar, P. Agricultural Performance and Productivity in Acharya, S.S and D. P. Chaudhri (eds) Indian Agricultural Policy at the Cross Roads*)

9. Annual Growth Rates of Area, Production and Productivity

The area under millets (sorghum, ragi and small millets) decelerated between 1990-91 and 1999-2000 as well as during 2000-01 and 2010-11. However, the decline in the area of millets was compensated by maize area which grew at more than 10 per cent per annum during the 1990s and by 9 per cent in the following decade (Table 10). Cereal production increased by 4.3 per cent per annum between 2000 and 2011 as against 3.4 per cent per annum during 1990 and 2000. The growth in cereal production was mainly due to the improvement in the yield of cereals which grew at 3 per cent per annum during 1990s and at 4 per cent between 2000 and 2011. The area under major pulses like chickpea and pigeon pea grew at a faster rate during 2001-2011 compared to the 1990-2000 period. Area under chickpea grew at a faster rate when compared with pigeon pea.

Table 10: Annual Growth Rates of Area, Production and Productivity

<i>Crop</i>	<i>1990-91 to 1999-2000</i>			<i>2001-01 to 2010-11</i>		
	<i>Area</i>	<i>Production</i>	<i>Yield</i>	<i>Area</i>	<i>Production</i>	<i>Yield</i>
<i>Rice</i>	1.72	3.64	1.89	1.66	2.83	1.15
<i>Sorghum</i>	-1.55	0.09	1.67	-3.76	2.10	6.09
<i>Pearl millet</i>	0.21	1.83	1.61	-0.20	3.36	3.57
<i>Maize</i>	10.25	10.49	0.21	8.63	10.60	1.81
<i>Finger millet</i>	-1.13	1.91	3.07	-2.38	0.29	2.74
<i>Wheat</i>	3.21	3.96	0.73	0.76	4.91	4.13
<i>Small millets</i>	-7.76	-8.08	-0.34	-10.66	-13.35	-3.01
<i>Cereals</i>	0.33	3.43	3.10	0.21	4.28	4.05
<i>Pigeon pea</i>	0.67	5.34	4.64	3.73	8.16	4.27
<i>Chick pea</i>	6.04	11.64	5.29	9.14	10.45	1.20
<i>Total Pulses</i>	0.68	3.44	2.75	3.01	6.26	3.15
<i>Food grains</i>	0.56	3.38	2.81	1.03	4.48	3.41
<i>Groundnut</i>	-1.32	-1.48	-0.17	-1.19	-2.03	-0.86
<i>Sunflower</i>	-6.49	-7.43	-1.01	0.56	2.50	1.93

<i>Total oilseeds</i>	-3.11	-2.13	1.01	-0.11	0.02	0.14
<i>Cotton</i>	-0.52	0.48	1.00	-0.84	7.56	8.47
<i>Sugarcane</i>	2.82	5.16	2.27	-0.50	-0.03	0.47

The area under foodgrains increased only modestly during the last two decades but the production of foodgrains rose by 3.4 and 4.5 per cent during 1990-2000 and 2001-2011 respectively. The growth in foodgrain production was the result of significant improvement in yield during the period under reference.

The area as well as productivity of groundnut came down during the last two decades resulting in – 2.03 per cent growth during 2001-11. Growth in the yield of sunflower decelerated during 1990s and coupled with the deceleration of area under sunflower, it resulted in a drastic reduction (7.43 per cent per annum) in the production of sunflower during 1990s. However, growth (1.93 per cent per annum) in yields during 2001-11 induced a modest growth (0.56 per cent) in area, resulting in 2.5 per cent growth in sunflower production during 2001-11. For cotton too, growth in area decelerated during the last two decades. However, growth in the yield of cotton has increased from 1 per cent in 1990s to 8.5 per cent per annum during 2001-11. The area as well as yield of sugarcane increased by more than 2 per cent per annum during 1990-2000 resulting in 5.16 per cent growth in production. Though there was a modest growth in sugarcane productivity during 2001-2011, area under sugarcane decelerated resulting in lower sugarcane production.

10. Average Area, production and Productivity of Major Crops

The total area under cereals increased from 53.27 lakh ha at TE 2003 to 54.46 lakh ha during 2007-10. Sorghum and small millets experienced reduction in the area whereas all other cereals registered a modest expansion between 2000/2003 and 2007/2010 (Table 11). Area under maize almost doubled during the reference period and so also the production. Productivity of maize increased from 2588 kg/ha in TE 2003 to 2729 kg/ha during TE 2010. Remunerative support price and market intervention operations taken up by the government of Karnataka for purchasing maize helped in area expansion under maize. Area under sorghum declined by more than 20 per cent but total production increased from 13.81 lakh tones in TE 2003 to 16.18 lakh tones during the TE 2010 due to 50 per cent improvement in the productivity. Pearl millet also experienced

improvement in the yield levels during 2007-10 over 2000-2003 period. The area under wheat increased marginally, productivity registered 18 per cent hike during the reference period between 200/03 and 2007-10.

Production of pulses increased to 11.18 lakh tones during TE 2010 as against 8.01 lakh tones during TE 2003. The increased production was contributed by 16 increase in the area and 20 per cent hike in productivity of pulses between 2000-2003 and 2007-10. It is interesting to note that area under chick pea increased more than 70 per cent despite stagnant yield levels. On the contrary, area under pigeon pea increased only by 19 per cent despite 39 per cent increase in the productivity during 2007-10. The productivity of pigeon pea increased from 409 kg/ha in TE 2003 to 569 kg during TE 2010.

Un-remunerative prices, uncertain rains and high cost of seeds have impinged upon the acreage under groundnut. Groundnut experienced decline in area as well as yield resulting in reduction in groundnut production in 2007-10. The area under sunflower increased from 6.46 lakh ha in 2000-03 to 9.40 lakh ha during 2007-10 and production increased by 60 per cent from 2.89 lakh tones to 4.62 lakh tones in 2007-2010. The total area under oilseeds increased marginally despite reduction in productivity of oilseeds resulting in marginal increase in the oilseed production during 2000-03 to 2007-10.

Table 11: Area, Production and Yield of Major Crops (TE 2003 and 2010)

<i>Crop</i>	<i>Triennium Ending 2003</i>			<i>Triennium Ending 2010</i>		
	Area	Production	Yield	Area	Production	Yield
<i>Rice</i>	13.52	31.57	2315	14.72	37.37	2539
<i>Sorghum</i>	17.86	13.81	773	13.78	16.18	1174
<i>Pearl millet</i>	3.19	1.85	553	3.34	2.32	676
<i>Maize</i>	6.33	16.53	2588	11.41	30.99	2729
<i>Finger millet</i>	9.14	13.80	1465	11.41	14.01	1723
<i>Wheat</i>	2.58	1.97	760	2.76	2.53	917
<i>Small millets</i>	0.65	0.38	585	0.32	0.14	445
<i>Total Cereals</i>	53.27	79.82	1485	54.46	103.54	1901
<i>Pigeon pea</i>	5.26	2.17	409	6.27	3.61	569

<i>Chick pea</i>	4.43	2.58	587	7.68	4.47	583
<i>Total Pulses</i>	20.00	8.01	401	23.16	11.18	483
<i>Food grains</i>	73.27	87.82	1191	77.62	114.72	1479
<i>Groundnut</i>	9.21	7.35	780	8.59	5.82	674
<i>Sunflower</i>	6.46	2.89	453	9.40	4.62	483
<i>Total oilseeds</i>	18.85	12.11	642	21.52	12.55	580
<i>Cotton</i>	5.18	6.00	1133	4.23	7.37	1983
<i>Sugarcane</i>	4.02	361.42	89639	3.08	266.70	86368

The production of cotton increased from 6 lakh tones in 2000-2003 to 7.37 lakh tones, a hike of 23 per cent despite reduction in the area. The increased production was solely contributed by yield improvement. The yield of cotton increased almost by 75 per cent during TE 2010 over 1133 kg per ha in 2000-2003. Area as well production of sugarcane declined by more than 20 per cent during TE 2010 when compared to TE 2003.

11. Input Use and Other Services

The use of inputs such as high-yielding crop varieties, chemical fertilizers, plant protection chemicals as well as farm machinery in agriculture has increased over the years which facilitated improvement in productivity and resulted in increased crop production.

a) Area under High-Yielding Varieties

The area under high-yielding varieties (HYVs) of major crops increased from 30.18 lakh hectares in 2000-01 to 38.54 lakh ha in 2005-06 and further to 41.44 lakh ha in 2009-10 (Table 12a). Area under HYVs grew at a faster rate between 2000-01 and 2005-06 than during 2005-06 to 2009-10. The area under HYV maize and wheat increased by more than 30 per cent whereas the area under HYV rice and sorghum recorded a modest increase of 1 and 2 per cent respectively during the five-year period from 2005-06 to 2009-10.

Table 12a: Area under HYV under Major Crops in Karnataka (Lakh ha)

Crops	2000-01	2005-06	2009-10
-------	---------	---------	---------

Rice	12.30	13.11	13.28
Sorghum	7.12	10.62	10.88
Pearl millet	4.19	4.15	2.93
Maize	6.57	9.19	12.32
Wheat	0	1.47	2.03
ALL	30.18	38.54	41.44

b) Changing Fertilizer Consumption

Expansion in irrigated area and coverage of high-yielding varieties resulted higher demand and use of chemical fertilizers in Karnataka. Total fertilizer consumption increased to 21.1 lakh tonnes by 2010-11 as against 12.5 lakh tonnes during 2001-02 (Table 12b). Consumption of phosphatic and potassic fertilizers was relatively higher when compared to nitrogenous fertilizers. The use of fertilizers increased from 103 kg per hectare in 2001-02 to 162 kg per ha during 2010-11.

Table 12b: Total and Per Hectare Consumption of Fertilizers

Year	Fertilizers used per hectare				Nutrient wise consumption			
	(In Kgs)				(In Lakh tonnes)			
	N	P	K	TOTAL	N	P	K	TOTAL
1991-92	30.1	23.6	13.4	67.1	4.5	2.9	1.7	9.1
2001-02	52.4	29.8	18	103.3	6.7	3.6	2.2	12.5
2005-06	58	33	26	117	7.5	4.4	3.4	15.3
2010-11	78	53	30	162	10.2	7	4	21.1

Source: GOK, Statistical Abstract of Karnataka, various issues

c) Pesticide Consumption

Use of plant protection chemicals (insecticides and pesticides) remained more or less stagnant and the technical grade material used hovered around 1,700 tonnes (except in 2006-07) despite the expansion in the area covered which increased from 38 lakh ha in 2005-06 to 73 lakh ha in 2009-10 (Table 12c).

Table 12c: Use of Pesticides and Total area covered

Year	Area Covered (Lakh ha)	Technical grade Material (Tonne)
2005-06	38.00	1698
2006-07	24.00	942
2007-08	58.50	1588
2008-09	70.00	1675
2009-10	73.00	1700

Source: GOK, Statistical Abstract of Karnataka, various issues

Awareness about the health hazards of pesticide use, introduction of integrated pest management practices and promotion of organic farming have resulted in reduced use of pesticide per unit area.

d) Seed

Availability and access to quality seeds are key factors in improving productivity and production of crops. Improved as well as hybrid seeds of various crops produced by private and public sector seed companies are available in the state. The state government has undertaken a programme of production and distribution of certified quality seeds from 2007-08. Under the seed replacement norms, seed replacement rates fixed for different agricultural crops during 2010-11 are (in per cent): cereals 23-34; pulses 23-26; oilseeds 15-87; cotton 17 and all hybrids 100. The seeds of 12 crops were distributed at subsidized prices under different programmes (Small and Marginal Farmers' Scheme, RKVY, PM's rehabilitation package, etc.). The production and distribution of certified quality seeds during 2007-08 through 2009-10 is presented in Table 12d.

Table 12d: Production and Distribution of Certified quality Seeds

(Quintals)

Particulars	2007-08	2008-09	2009-10	2010-11	2011-12 (Target)
Production	580950	707769	1087450	1128258	1145824
Distribution	919860	919976	1035123	1292765	1159575

GOK, Economic Survey of Karnataka 2011-12

e) Farm Machinery and Equipment

Traditionally, farming was carried out using bullock power and human labour. However, increasing cost of maintaining bullock pair, shortage of labour for farm operations and paucity of time induced farmers to adopt mechanization. Mechanization facilitates timely completion of farm operations with desired results and precision. It also helps in reducing the drudgery associated with different conventional operations. A large number of farm equipment and machinery are used in farming. However, we provide below (Table 12e) the number of major farm equipment and machinery based on a 2006-07 input survey report. Farm machinery and equipment are distributed to farmers under the centrally sponsored Scheme of Farm Mechanization being implemented under the Macro Management Mode of Agriculture. The farm mechanization programme is also implemented as the Karnataka Farm Mechanization Mission. Farmers get 50 per cent subsidy for farm machinery and equipment.

Table 12e: Farm Machinery and Equipment

Major Farm Machinery	Numbers
Power Operated Sprayer/Duster	166129
Diesel Engine Pump set	249721
Electric Pump set	1108284
Power Tiller	205710
Tractors Used For Agri Purposes	1759586
Power Thresher (Wheat, Paddy Multiple)	682071
Combine Harvesters Trailed Type	15442
Combine Harvesters Self Propelled	32341
Others	139555
Sprinklers Used For Irrigation	93959
Drip irrigation Sets	91719

Source: Input Survey, 2006-07

12. Horticulture

Karnataka is endowed with diverse agro-climatic conditions enabling it to grow a variety of horticultural crops such as fruits, vegetables, flowers, spices and plantation crops. The plantation and horticulture sector plays a vital role in the economy of the state. During the year 2009-10, horticulture crops covered an area of 18.99 lakh ha as against 17.64 lakh ha during 2007-08 (Table 13). Though the area under horticultural crops had a share of less than 15 per cent of the net cultivated area of the state, the income generated from the sector accounts for 40 per cent of the total income from the agriculture sector (NABARD, 2010). Karnataka is implementing the National Horticulture Mission (NHM) programme from 2005-06. The coverage of NHM increased from 15 districts in 2005-06 to 30 in 2010-11. The total area under horticultural crops has gone up by 12 per cent between 2007-08 and 2010-11 with area under fruit crops expanding by more than 25 per cent during the period.

Table 13: Area under Major Horticultural Crops

(Lakh hectares)

<i>Crops</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11*</i>
<i>Fruits</i>	2.99	3.18	3.60	3.79
<i>Coconut</i>	4.60	4.71	4.87	4.97
<i>Spices</i>	2.46	2.43	2.66	2.75
<i>Vegetables</i>	4.27	4.21	4.37	4.58
<i>Cashew</i>	0.70	0.70	0.70	0.73
<i>Flowers</i>	0.25	0.27	0.27	0.28
<i>Others</i>	2.37	2.50	2.52	2.57
<i>Total</i>	17.64	18.00	18.99	19.67

Note: * Anticipated

Source: GOK, Economic Survey, 2011-12

13. Animal Husbandry

Animal husbandry and dairy farming are important sources of supplementary income to farmers. Livestock also helps in reducing the variability in income of farm families and insulates them from risk. Animal husbandry contributes about 3 per cent to the GSDP of Karnataka and roughly 22 per cent to the state GSDP generated from agriculture as a whole. Karnataka is a leading state in milk production in the country and has a good network of milk co-operative societies, milk-chilling plants, veterinary hospitals, AI centres, etc. Karnataka ranks third in sheep population and sixth in egg production (GoK, 2012). The bovine (cattle and buffaloes) population of the state was 152 lakh in 1997, but declined to 135 lakh in 2003. However, as per the 18th Livestock Census, bovine population has increased to 148 lakh in 2007 (Table 14). The sheep and goat population in the state reached 157 lakh in 2007 from 117 lakh during the 17th Livestock Census of 2003, a 33 per cent growth during the five-year period. Poultry population in the state increased by more than 70 per cent between 17th and 18th Livestock Census.

Table 14: Livestock Population of Karnataka (2007)

(Nos. in Lakh)

Particulars	Livestock Census			
	1997	2003	2007	% change in 2007 over 2003
Cattle	108	95	105	9.40
Buffaloes	44	40	43	7.50
Goat and Sheep	129	117	157	33.05
Other Livestock	26	30	24	-20.00
Total Livestock	307	284	329	15.85
Poultry	214	244	424	73.77

Source: GOK, Economic Survey, 2011-12

There were 10,534 active dairy co-operative societies with 20.40 lakh active members as on September 2010. The State operates 22 dairy processing plants with a total capacity of 32.25 lakh litres per day and has 42 milk-chilling centres with a capacity of 15.15 lakh litres per day. Karnataka also has 5 product dairies with a capacity to produce 92 MT of milk powder per day. Karnataka has 362 veterinary hospitals, 1,940 veterinary dispensaries, 1,181 veterinary centres and 174 mobile veterinary centres (GoK, 2011-12).

14. Fisheries

Karnataka has a 300-km coastline with a continental shelf of 27,000 sq km and 5.60 lakh hectares of inland waters. This provides immense scope for the development of fisheries. In addition to this, about 8,000 ha of brackish water area provides good scope for shrimp farming. The total fish production in Karnataka was around 2 lakh tonnes in the early eighties and reached more than 5 lakh tonnes in 2010-11, of which 60 per cent was contributed by the marine sector and 40 per cent by the inland fisheries sector (GoK, 2011-12). The growth in marine and inland fish production is presented in Table 15.

Table 15: Fish Production in Karnataka

(Lakh MTs)

Year	Marine	Inland	Total
2000-01	1.78	1.27	3.05
2005-06	1.77	1.21	2.98
2006-07	1.68	1.24	2.92
2007-08	1.76	1.22	2.98
2008-09	2.18	1.44	3.62
2009-10	2.49	1.59	4.08
2010-11	3.41	1.86	5.27

Source: GOK, Economic Survey, 2011-12

15. Storage, Godowns and Markets

It is estimated that about 6 per cent of the foodgrains and roughly 30 to 40 per cent of the horticulture produce, mainly fruits and vegetables, are lost due to non-availability of proper storage facilities. This affects the post-harvest management of agricultural and horticultural produce. Lack of storage facilities creates a glut in the market during the harvest season and producers are compelled to sell their produce at lower prices. The storages and godowns are operated by private as well as public sector companies. The Karnataka State Warehousing Corporation has a storage capacity 9.04 lakh MT, of which 4.97 lakh MT is owned and 4.07 MT is hired. Similarly, there are 157 cold storages owned by private, co-operative and public sector units with a capacity of 3.97 lakh MT (GoK, 2012).

Most of the agriculture produce in the state is marketed by the Agriculture Produce Marketing Committee (APMCs) yards. There are 504 regulated markets in the state, of which 151 are main markets and 353 sub-markets. The density of regulated markets for agriculture produce varies across the districts and it ranges from 6 markets in Bangalore rural and Udupi to a maximum of 47 markets in Belgaum. The total turnover in the regulated markets is around Rs 22,455 crore per annum.

16. Agricultural Credit

The State of Karnataka has a good banking network of commercial banks, RRBs and co-operatives. Currently, 27 public sector banks, 16 private commercial banks and six regional rural banks are operating in the state. The growing demand for institutional finance has resulted in the expansion of banking network and credit flow. There were 755 bank branches at the time of nationalization in 1969 and the number reached 7,268 by March 2011. Among the total number of bank branches, 5,122 are commercial banks, 1,256 rural regional banks and the remaining 890 branches of co-operative banks (NABARD, 2011). The rural and semi-urban branches account for 38.61 per cent and 20.57 per cent respectively of the total 7,268 bank branches in Karnataka.

Disbursement of credit in rural areas takes place through co-operatives, commercial banks and regional rural banks. The total crop loans disbursed increased from Rs 6,454.84 crore in 2005-06 by more than 60 per cent to Rs 10,592.32 crore during 2009-

10 (Table 16 and Fig. 4). The targets set for disbursement of crop loans were fulfilled from 2005-06 to 2007-08. However, there was a gap of 17 and 10 per cent between the targets and achievements in crop loan disbursement during 2008-09 and 2009-10, respectively.

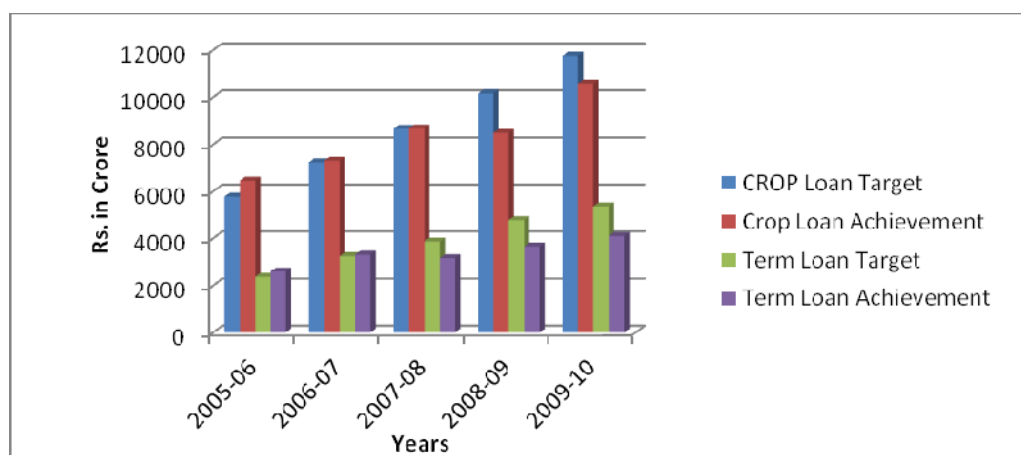
Actual disbursement of term loans for agriculture increased from Rs 2,598.09 crore in 2005-06 to Rs 4,094.21 crore in 2009-10. The targets fixed for disbursement of term loans for agriculture were achieved or exceeded during 2005-06 and 2006-07, but from 2007-08 the achievements have fallen short of targets. There is a gap of 20 to 25 per cent between the targets and actual disbursement of term loans from 2007-08 to 2009-10.

Table 16: Ground Level Credit Flow to Agriculture Sector – Targets and Achievements

Rs crore					
<i>Category</i>	<i>2005-06</i>	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>
<i>Crop Loan</i>					
<i>Target</i>	5773.86	7246.90	8665.52	10161.86	11765.92
<i>Achievement</i>	6454.84	7302.79	8676.38	8483.38	10592.32
<i>Agricultural Term Loan</i>					
<i>Target</i>	2367.58	3244.74	3865.99	4779.66	5366.39
<i>Achievement</i>	2598.09	3308.79	3157.84	3661.02	4094.21
<i>Total Agricultural Credit</i>					
<i>Target</i>	8141.44	10491.64	12531.51	14941.52	17132.31
<i>Achievement</i>	9052.93	10611.58	11834.22	12144.40	14686.53

Source: NABARD, State Focus Paper, 2011-12, Karnataka.

Fig. 4. Ground Level Credit Flow to Agriculture Sector



17. State domestic Product

The Gross State Domestic Product (GSDP), which was Rs 270,629 crore during 2007-08, rose to Rs 345,236 crore in 2009-10 and touched Rs 465,552 crore (current prices) in 2011-12 (Table 17). The per capita income (in current prices) increased from Rs 47,237 in 2007-08 to Rs 69,493 during 2011-12. Agriculture took a share of 16.94 per cent of the State GSDP in 2011-12 as against 17.04 per cent in 2007-08. Surprisingly, the share of industrial sector also indicated a declining trend over the years and its contribution declined from 31.81 per cent in 2007-08 to 27.74 per cent of the State GSDP in 2011-12.

Table 17: Sectoral shares of GSDP for Karnataka (Current Prices)

Industry	2007-08	2008-09	2009-10	2010-11	2011-12
Agriculture	17.04	15.87	16.25	16.78	15.94
Industry	31.81	31.34	29.27	28.6	27.74
Services	51.15	52.8	54.48	54.61	56.32
Total	100	100	100	100	100

(Rs in Crore)

(270629)

(310312)

(345236)

(405123)

(465552)

Source: GoK, Economic Survey, 2011-12

The sectoral growth rates during this period for agriculture and allied activities, industry and services are 5.7 per cent, 5.3 per cent and 10.3 per cent, respectively. In general, the trends in the annual growth rate of GSDP correspond to the growth rates of industry and service sectors, and the State GSDP grew at 8.0 per cent per annum between 2007-08 and 2011-12. At the same time, per capita GSDP is expected to increase from INR 42,914 (USD 869.6) in 2009-10 to INR 45,962 (USD 931.3) in 2010-11 or about 7%. The growth of GSDP is comparable with that of all-India level. (GOK, 2012).

18. Impediments to Growth

The agro-climatic character of the state divides it into varied agro-climatic zones. This influences the cropping pattern and cultivation practices followed across the regions. Similarly, the resource endowment and delivery system of inputs also differ across the regions. Broadly, one can divide Karnataka into five zones based on agrarian and agro-ecological systems, namely, Bombay Karnataka zone, Hyderabad Karnataka zone, Southern dry zone, Southern irrigated zone and Western coastline. Among these regions, the un-irrigated plateau zones of Northern Karnataka and Southern Karnataka are the main lagging regions of the state. Investment from public and private sources in these two regions remained at the lowest rung in the development ladder (GoK, 2003) and failure to bring investment to the rural areas of these two regions has caused impediments to spur growth. Hitherto, agriculture was considered the only alternative to bring these regions into mainstream growth, but climatic conditions and resource endowments do not support such an initiative. On the contrary, weather-induced instability continues to inflict misery on farmers in these areas. However, it has been observed that horticultural crops have been picking up both in terms of area as well as productivity in these regions.

The major challenges faced by agriculture in Karnataka are: threat of stagnation in agriculture growth with possibility of decelerating growth, low value-addition in agriculture, fast approaching optima on technological front, large proportion of rain-fed /

dry land area, marginalization of agricultural land base, inadequate growth in public and private investment, regional disparities in investment, low technology adoption and growth, inadequate and inefficient safety nets and finally, conflicting demands of growth versus environmental protection (GOI, 2004). To resolve these issues, it is imperative to focus on rain-fed agriculture, develop initiatives for small and marginal farmers, rebuild natural resource base by promoting an organic approach to farming and develop key infrastructure to provide a boost to growth momentum.

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AGRICULTURAL PROFILE OF KARNATAKA STATE

M. J. Bhende

Introduction:

The history of Indian agriculture dates back to 10,000 years. Indian agriculture began during 9000 BC as a result of early cultivation of plants and domestication of crops and animals. The middle ages in India saw irrigation channels that reached a new level of sophistication. Land and water management systems were developed with the objective of providing uniform growth. The agricultural sector employed 60 per cent of the total workforce in India, and despite a steady decline of its share in the GDP, it still remains the largest economic sector. Agriculture plays a significant role in the overall socio-economic development of India.

Karnataka is India's eighth largest state in geographical area covering 1.92 lakh sq km and accounting for 6.3 per cent of the geographical area of the country. The state is delineated into 30 districts and 176 taluks spread over 27,481 villages. In Karnataka, agriculture is the major occupation for a majority of the rural population. As per the population Census 2011, agriculture supports 13.74 million workers, of which 23.61 per cent are cultivators and 25.67 per cent agricultural workers. A total of 123,100 km² of land is cultivated in Karnataka constituting 64.6% of the total geographical area of the state. The agricultural sector of Karnataka is characterized by vast steppes of drought-prone region and sporadic patches of irrigated area. Thus, a large portion of agricultural land in the state is exposed to the vagaries of monsoon with severe agro-climatic and resource constraints. Agriculture employs more than 60 per cent of Karnataka's workforce.

Agriculture in Karnataka is heavily dependent on the southwest monsoon. While only 26.5 per cent of the sown area (30,900 km²) is under irrigation, 64.60 per cent of the total geographical area is under cultivation. The state ranks fifth in India in terms of total area under horticulture. It stands fifth in production of vegetable crops and third in fruit crop production. It is also the largest producer of spices, aromatic and medicinal crops and tropical fruits. It is the second largest milk-producing state after Gujarat. Karnataka is also the second largest producer of grapes in the country, and accounts for the

production of 12 per cent of total fruits, 8 per cent of total vegetables and 70 per cent of coffee in the country. It is the third largest producer of sugar and ranks fourth in sugarcane production. In floriculture, Karnataka occupies the second position in India. Karnataka is the major silk producing state in the country http://en.wikipedia.org/wiki/Economy_of_Karnataka - [cite note-stats-8#cite note-stats-8\(http://www.advantagekarnataka.com/images/pdf/Doing-Businessin-Kar.pdf\)](http://www.advantagekarnataka.com/images/pdf/Doing-Businessin-Kar.pdf). It has a coastline of 320 km and yields an annual marine production of 425,000 MT with 276 varieties of fishes. Karnataka leads in the export of silk in India with an approximate share of 25 per cent of the total Indian export market.

Agriculture plays an important role in the overall growth of Karnataka's economy despite a fall in its share in the state domestic product. In Karnataka, horticulture crops occupy about 15.21 lakh hectares with an annual production of about 96.60 lakh tonnes. Karnataka is highly progressive with regard to vegetable production, and enjoys this advantage because of favourable climatic conditions without any extremes in temperature. It is also well known for floriculture production and is a major silk-producing state in the country. The fisheries sector is now emerging as one of the most important in allied agriculture activities in the state.

Agriculture remains the primary activity and main source of livelihood for the rural population in the state. It is characterized by wide crop diversification and remains highly dependent on the vagaries of the southwest monsoon. During 2010-11, foodgrain production in the state increased at an enormous rate of more than 14% over the previous year and this increase was mainly led by an increase in yield as the area increase during the year was only 2.9 per cent. Agriculture contributed 15.94 per cent (at constant prices) to the state's GSDP in 2011-12. There has been a decline in GSDP generated from the agricultural sector and consequently, the SDP per worker in the sector has been declining at a faster rate in the recent past when compared to the last decade.

Agricultural growth rate (constant prices 2004-05) has fluctuated from a low of -2.8 per cent during 2006-07 (over 2005-06) to a high of 13.3 per cent in 2010-11 (over 2009-10) and again down to -2.9 per cent in 2011-12. Although per capita income has shown considerable increase owing to the growth in manufacturing and service sectors, the per capita GSDP in rural areas from agricultural activities remains low and hence the inter-

sectoral inequalities are growing sharply. A large number of workers depend on agriculture relative to the output it generates, resulting in lower labour productivity compared to non-agricultural sectors. Less than one-fifth of the SDP comes from more than 50 per cent of the workforce in the state. This has serious implications for improving the welfare of rural population and alleviation of poverty.

2. SOILS

- There are varied types of soils in Karnataka. Six broad groups of soil orders are recognized, based on differences in soil formation processes, as reflected in the nature and sequence of soil horizons. Black soils are found in northern Karnataka whereas red and red loamy soils are prominent in southern Karnataka. Laterite soils are found in malnad and coastal areas of the state (Table 1). A brief description of the properties of these soil groups, along with their distribution across districts of Karnataka, is presented below as well as depicted in Fig 1.

Talking about the **soils in Karnataka**, we can summarize the following points:

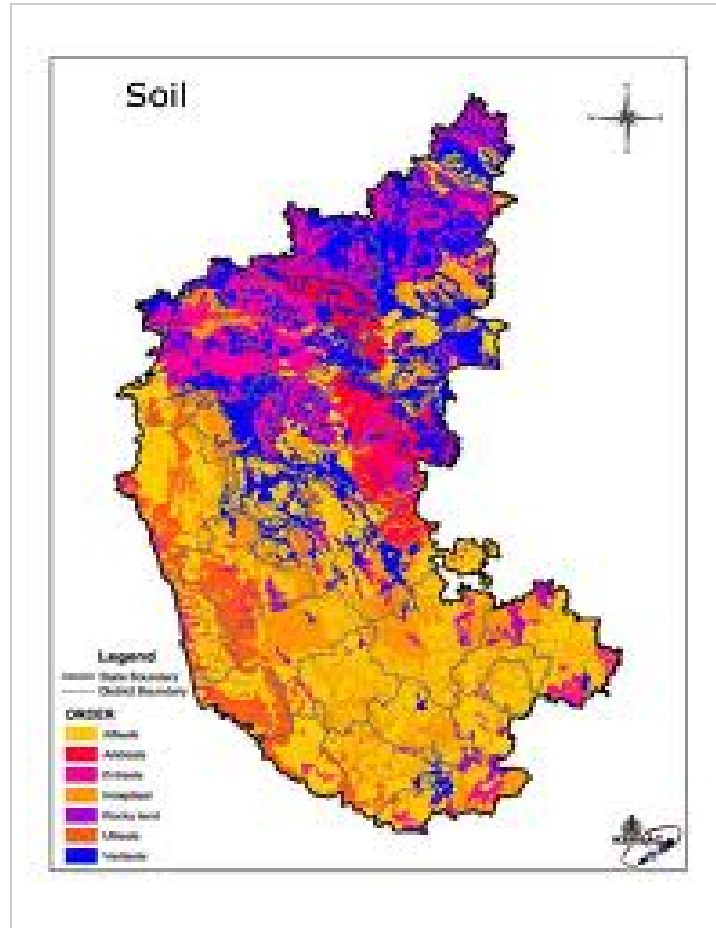
- **Black soils:** These soils are derived from basalt, though some are formed from limestones, shales, alluvium and schists. These soils have high plasticity, stickiness and tendency to swell and shrink when subjected to wetting and drying cycles. They have high water holding capacity with low bulk density.
- **Red soils:** These form the most widespread soil type in Karnataka. The red soil results from the weathering of the crystalline and metamorphic rocks and its red color comes from the diffusion of iron oxide in high proportions.
- **Red loam soils:** These are generally deep to very deep and the clay content can vary. The soils are subject to intense leaching. They are fairly well drained in the uplands and water logged in low-lying areas.

Mixed red and black soils: The coarse textured red **soils** with high permeability are found in upland areas whereas deep, clayey, poorly drained black soils occur in the low lands and valleys. The topography and parent material are the major soil forming factors under the influence of which these mixed red and black soils are formed. These are derived from either gneisses or schists rocks or sedimentary rock formations. **Table 1: Soils of Karnataka**

SOIL NAME	PROPERTIES	DISTRIBUTION
(1) Black soil	In texture, soil varies from loam to clays. Generally they are neutral to alkaline in reaction, calcareous and well supplied with bases such as Ca, Mg, K. Black soils are known to get self ploughed due to their swelling and shrinking properties with changes in moisture content.	Districts are Belgaum, Bijapur, Gulbarga and Bidar; also parts of Raichur, Chitradurga and Bellary
(2) Laterite soil	Laterite soils result from advanced stages of weathering; highly leached, they are poor in bases and very acidic in reaction. The moisture retentivity of the soil is very poor; soil contains adequate quantities of organic matter.	Malnad and coastal areas of U.K, D.K and parts of Dharwad, Chikmagalur, Hassan
(3) Red and red loamy soil	They are light textured, from sandy to gravelled or loamy, with poor aggregating ability. They are poor in bases and acidic to neutral in reaction.	Shimoga, Chikmagalur, Hassan, Mysore and Kodagu.
(4) Coastal alluvials	The surface soil is generally grey, yellow or light brown; the intensity of the colour increases with depth. The soils are acidic in nature, low in cation exchange capacity and bases.	Dakshin Kannada, and Uttar Kannada
(5) Dark brown clayey soil	They are clayey, low in bases, rich in organic matter as the surface soil receives the decomposition product of the virgin forest	Dakshin Kannada, Uttar Kannada, Kodagu & Mysore
(6) Mixed red and black soil	Black soil seen in the low lands and valleys has properties resembling those of medium black soil. Soils are productive under good management practices.	Belgaum, Bijapur, Dharwad, Raichur, Bellary and Chitradurga.

Source: <http://raitamitra.kar.nic.in/agriprofile/table5.htm>

Fig. 1



3. Land-use Pattern

Land is a finite resource and its demand for diverse purposes is increasing day by day. There are large areas of utilizable but wasteland resources. Moreover, the pressure of commercialization is increasingly forcing out productive land resources for non-agricultural uses. Considering the importance of land use and policy, the Government of Karnataka brought out a document on land use policy recently (GoK, 2003).

The analysis of land use data from 1966 to 2009 indicates structural changes in land use pattern. Areas under permanent pasture decreased consistently and areas under non-agricultural uses increased sharply during the past four decades. Fallow land, which was

around 11 lakh ha, increased to 13.50 lakh ha after mid-nineties (Table 2). Fallow land area fluctuates from year to year; in certain years (like 1998-99, 1990-2000, 2001-02, 2006-07 and 2008-09), the percentage reached above 10 per cent of the total (190.50 lakh ha) geographical area of the state. This was mainly because of deficient rainfall and the inability of the government to provide irrigation facilities in those years. The net sown area also started shrinking after 1990s. The net sown area, which accounted for 55.776 per cent of the total geographical area of the state in the triennium ending 1988, declined to 54.28 per cent during the triennium 2007-09. The interpretation of this data is difficult due to many factors like illegal encroachments and changing land use due to population pressure and market forces (GOI, 2004).

Table 2: Area under various land use categories

Area in lakh hectares

<i>Land use category</i>	<i>Triennium Ending with</i>				
	<i>1967-68</i>	<i>1977-78</i>	<i>1987-88</i>	<i>1997-98</i>	<i>2010-11</i>
<i>Non-Agr. Purposes</i>	8.76	10.36	11.72	12.88	13.97
<i>Permanent Pastures</i>	16.76	14.49	11.32	10.03	9.16
<i>Current Fallows</i>	10.65	13.05	10.90	13.59	13.33
<i>Net Sown Area</i>	100.67	99.40	106.21	104.01	103.67
<i>Gross Irrigated Area</i>	12.97	17.16	23.83	29.70	40.94

In future, land demand for non-agricultural purposes is going to increase. Area used for non-agricultural purposes mainly includes land under urban areas, land used for infrastructure projects, dams and irrigation systems, industries and special economic zones and mines and quarries (KSLUB, 2001). The Perspective Land Use Plan for Karnataka - 2025, published by the State Land Use Board, GoK in 2001, presents the projected land use plan under various land use categories for Karnataka up to the year 2025. It lists the current area and projected demand for non-agricultural purposes in Karnataka (Table 3). It is being felt that these estimates are low as they do not include the proposed SEZs, urban infrastructure projects, airports etc., which need the land

converted from agriculture. Even these estimates project that more than 220,000 hectares of land has to be found for non-agricultural purposes.

Table 3: Current and Estimated Demand of Land for Non-agricultural Purposes

Area in '000 ha

Category	2001	2025
Towns	427	567
Mining	65	68
Industries	18	39
Roads	88	132
Railways*	16	16
Power	81	93
Irrigation (submerged)	195	195
Total	890	1110

* Estimated projections for railways and irrigation not available.

Source: Karnataka State Land Use Board (KSLUB, 2001): "Perspective Land Use Plan for Karnataka 2025" Government of Karnataka, Bangalore.

4. Rainfall

Rainfall plays an important role in crop production in Karnataka as more than 70 per cent of the cropped area is rain-fed. There are 1,256 rain gauge stations in the state of which 1,170 are functioning and 86 are non-functional. The long-term (1901-1970) annual average rainfall in the state, which was 1,339 mm, has declined to an average precipitation of 1,217 mm during the years 1941-1990. The average rainfall between 1998 and 2008 indicated increased precipitation during summer and south-west monsoon season and modest reduction during the north-east monsoon season (Table 4). Variability in precipitation ranged from 26 per cent for north-east monsoon to 173 per cent for summer months. The actual rainfall received during south-west monsoon (June-September) as well as north-east monsoon (October – December) during 2010 is higher

than the normal precipitation in the state. The total rainfall was 1,500 mm, which is 303 mm or 25 per cent more than the normal rainfall of 1,198 mm.

Table 4: Season-wise Normal and Average Rainfall (in mm)

Period	Normal Rainfall (1941-1990)	Average rainfall (1998 to 2008)	CV (%) (1998 to 2008)	Average rainfall 2010
Summer (Jan.-Mar.)	13	24.6	173	15
Pre-monsoon (Apr.-May)	131	124.9	42	126
Southwest monsoon (June-Sept.)	861	934.5	28	1064
Northeast monsoon (Oct.-Dec.)	193	177.0	26	295
Annual Total	1198	1261	21	1500

As stated earlier, Karnataka has varied agro-climatic conditions ranging from large semi-arid regions to coastal and rain-shadow areas. The average annual rainfall for 1998 to 2010 ranged from a minimum of 547 mm in Bijapur to a maximum of 4,471 mm in Udupi district. The districts located in southern and coastal parts of the state viz., Shimoga, Chickmagalur, Kodagu, Uttar Kannada, Dakshin Kannada and Udupi, received an average annual rainfall of more than 2,000 mm. On the contrary, districts like Bijapur, Bellary, Bagalkot, Koppal, Gadag, Raichur and Chitradurga can be classified as low rainfall districts where average annual rainfall (1998-2010) is less than 650 mm. The normal rainy days varied from less than 40 in low rainfall districts to more than 80 in high rainfall districts (Table 5). The variability in annual average precipitation measured in terms of coefficient of variation (CV) was lower in the districts having high rainfall than in the

districts having lower annual rainfall. The CV in annual rainfall ranged from 11 per cent in Dakshin Kannada to 31 per cent in Bagalkot district.

Table 5: Normal and Actual Rainfall (Triennium Average) by Districts in Karnataka

<i>District</i>	Normal Rainfall	Normal Rainy days	Triennium Average Annual Rainfall					CV (%) 1998-2010
			1998-2000	2001-2003	2004-06	2007-2009	1998-2010	
<i>Bagalkot</i>	584	40	634	377	489	689	554	31
<i>Bangalore (R)</i>	740	41	893	571	766	792	756	25
<i>Bangalore (U)</i>	835	49	1001	604	895	921	855	26
<i>Belgaum</i>	842	53	899	630	1010	1023	901	20
<i>Bellary</i>	604	40	566	422	524	648	550	23
<i>Bidar</i>	886	49	893	730	799	749	812	16
<i>Bijapur</i>	632	40	583	405	511	668	547	30
<i>Chamarajanagar</i>	730	43	930	673	948	831	936	24
<i>Chikamagalur</i>	2073	87	2362	1777	2445	2690	2321	16
<i>Chitradurga</i>	495	31	586	422	602	722	607	27
<i>Dakshina Kannada</i>	3519	117	4161	3568	3978	4008	3969	11
<i>Davanagere</i>	623	43	638	471	657	832	678	28
<i>Dharwad</i>	787	58	679	474	702	793	676	23
<i>Gadag</i>	631	43	586	417	545	758	587	26
<i>Gulbarga</i>	839	45	765	548	649	723	690	21
<i>Hassan</i>	1148	58	1137	836	1348	1347	1186	21
<i>Haveri</i>	782	61	730	529	730	908	751	24
<i>Kodagu</i>	2692	111	2806	2292	3251	2953	2814	17
<i>Kolar</i>	614	32	675	546	699	819	696	26
<i>Koppal</i>	587	36	602	417	470	736	571	30
<i>Mandya</i>	648	37	816	572	801	696	732	24
<i>Mysore</i>	730	47	894	631	804	721	769	18
<i>Raichur</i>	654	37	664	473	540	663	590	25
<i>Shimoga</i>	2421	89	2452	1764	2407	2582	2308	15
<i>Tumkur</i>	585	32	716	484	630	707	650	22
<i>Udupi</i>	4252	121	4783	4002	4250	4667	4471	12

Uttara Kannada	2887	103	3307	2552	3198	3296	3107	14
Ramanagara	809	46	1011	582	853	785	807	25
Chikkaballapur	677	37	718	582	772	757	725	26
Yadgir	839	45	758	504	621	716	661	27
Karnataka	1198	56	1275	972	1230	1307	1209	14

Source: DES, Government of Karnataka

5. Land Holding

It is interesting to note that the number of small and marginal holdings as well as their share in the total operated area is increasing over the years. The increase in small and marginal holdings and area operated became more conspicuous after 2000-01 (Table 6). Small and marginal farmers (operating < 2 ha) account for 76 per cent of the holdings and share roughly 37 per cent of the operated area in Karnataka. The average size of operated area of all the land size classes is declining. This clearly indicates the increasing fragmentation of land holdings in the state.

Table 6: Number Holdings and Area Operated under Different Farm Sizes

Number of holdings and Area in %

Years	< 1 ha	1 to 2 ha	2 to 4 ha	4 to 10 ha	10 & Above	Total holdings & Area in '000'
Number of Holdings						
1970-71	30.44	23.66	22.19	17.54	6.17	3551
1980-81	34.56	24.53	21.30	15.36	4.25	4309
1990-91	39.16	27.46	20.14	11.01	2.23	5776
200-01	45.94	26.97	17.78	8.04	1.27	7079
2005-06	48.23	26.55	16.86	7.31	1.06	7581
Area Operated						
	< 1	1 to 2	2 to 4	4 to 10	10 & Above	
1970-71	4.83	10.74	19.40	33.36	31.68	11368
1980-81	6.24	13.14	21.90	34.21	24.52	11746
1990-91	8.70	18.73	25.97	30.60	16.00	12321
200-01	12.12	22.28	27.86	26.95	10.78	12307

2005-06	13.34	23.22	28.00	25.89	9.55	12385
Average Operated Area per holding in ha						
1970-71	0.51	1.46	2.8	6.09	16.43	3.2
1980-81	0.49	1.46	2.8	6.07	15.69	2.73
1990-91	0.47	1.46	2.75	5.93	15.28	2.13
200-01	0.46	1.44	2.72	5.83	14.74	1.74
2005-06	0.45	1.43	2.71	5.79	14.79	1.63

The shrinking sizes of holdings and the high proportion of unviable farmers impinge upon the quality of life. The economic unviability of a large number of small and marginal holdings and the hardship faced by their holders are reflected in the growing number of suicides committed by farmers. This calls for initiating a new phase of land reforms, especially policies related to land tenancy.

6. Population and Workforce

The population of Karnataka which was 5.29 crore in 2001 has increased to 6.11 crore in 2011. The female population of Karnataka which accounted for 49.10 per cent of the total population in the state during the 2001 census has gone up marginally to 49.19 per cent in the 2011 census. The total population growth in this decade was 15.67 per cent while in the previous decade it was 17.25 per cent. The population of Karnataka forms 5.05 per cent of the all-India population in 2011 as against 5.14 per cent during the 2001 census. Rural population which formed 66 per cent of the total population of Karnataka in 2001 declined to 61.43 per cent in 2011 (Table 7). The proportion of rural female population declined from 49.41 per cent in 2001 to 49.19 per cent in 2011. On the contrary, the proportion of female population in urban Karnataka rose marginally from 48.50 per cent in 2001 to 48.91 during 2011.

Table 7: Population of Karnataka during 2001 and 2011 Census

Population in '000'

Population	Census 2011			Census 2001		
	Total	Rural	Urban	Total	Rural	Urban
Persons	61,095	37,469	23,626	52,851	34,889	17,962
Males	30,967	18,929	12,037	26,899	17,649	9,250

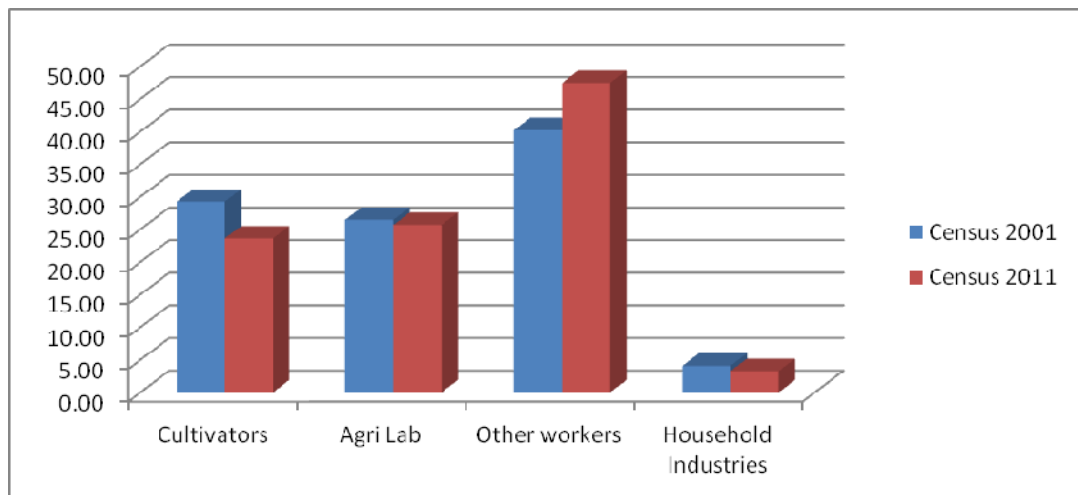
Females	30,129	18,540	11,589	25,952	17,240	8,712
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Source: Karnataka Census, 2011

Workforce:

According to the 2001 census, workers constituted 44.53 per cent of the total population and the rest 55.47 per cent were non-workers. There were 2.35 crore main workers accounting for roughly 37 per cent of the total population as per the 2001 census. The cultivators (29.25 per cent) and agricultural labourers (26.46 per cent) formed 56 per cent of the workforce of Karnataka (Fig.2). Workers in the household industry accounted for 4 per cent whereas other workers constituted 40.21 per cent of the total workers in Karnataka in 2001. As per the 2011 census, 2.79 crore people accounting for 45.62 per cent of the population form the workforce and among these, cultivators accounted for 21.66 per cent and agriculture labour constituted 18.37 per cent in the state. It is interesting to note that the share of both cultivators as well as agricultural workers has declined in 2011 from the 2001 census figures.

Fig. 2: Changing Proportion of Workers in Karnataka



7. Irrigation

Irrigation plays an important role in improving production and productivity of agriculture. It facilitates adoption of improved technologies and increases cropping intensity thereby

making optimum use of a finite resource i.e., land. There has been a gradual increase in the irrigated area in the state. The gross irrigated area has increased steadily from 9.06 lakh ha during 1960-63 to 27.45 lakh ha during 1990-93 and touched 41.87 lakh ha for the triennium ending 2008-11 (Table 8). The net irrigated area is 34.90 lakh ha at the triennium ending 2008-11 when compared with 22.05 lakh ha during 1990-93.

Table 8: Source of Irrigation (Triennium Averages)

Area in Lakh ha

Triennium	Canal	Tanks	Tube Wells	Wells	Other Sources	Net Irrigated Area	Gross Irrigated Area
1960-63	2.56 (28.28)*	3.58 (39.49)	0.00 (0.00)	1.46 (16.11)	1.46 (16.12)	9.06 (100.00)	9.96
1970-73	4.38 (35.91)	3.67 (30.07)	0.04 (0.30)	3.11 (25.51)	1.00 (8.21)	12.20 (100.00)	15.02
1980-83	6.11 (40.49)	3.17 (21.02)	0.07 (0.48)	4.02 (26.68)	1.71 (11.33)	15.08 (100.00)	18.59
1990-93	8.94 (40.55)	2.65 (12.00)	2.11 (9.57)	5.32 (24.12)	3.04 (13.76)	22.05 (100.00)	27.45
2000-03	8.81 (34.50)	2.29 (8.97)	6.17 (24.16)	4.69 (18.37)	3.57 (13.99)	25.53 (100.00)	30.67
2004-07	10.11 (34.73)	1.86 (6.40)	9.36 (32.13)	3.93 (13.51)	3.86 (13.24)	29.12 (100.00)	35.21
2008-11	11.08 (32.84)	1.99 (5.92)	12.24 (36.29)	4.23 (12.53)	4.19 (12.40)	34.90 (100)	41.87

*Note: * Figures in parenthesis are percentage to NIA*

Among the irrigation sources, canals and tanks were the major sources of irrigation till 1980s. However, the share of tube/bore wells in the total irrigated area started increasing phenomenally after early 1990s. In 2008-11, the net area irrigated by tube/bore wells accounted for 36.29 per cent of the total net irrigated area in Karnataka as against 32.84 per cent covered by canal irrigation.

8. Cropping Pattern

The cropping pattern of the region is influenced not only by agro-climatic conditions like rainfall, soil, temperature, etc., but also by government policies and programmes for crop production in the form of subsidies, support prices, tariffs and speed of infrastructure development. The overall trends in area allotted for various crops during five decades show that cropping pattern in Karnataka is dominated by food crops, with a share of more than 60 per cent of the gross cropped area in the state. Rice, sorghum and finger millet were the major cereals till 2000-03. However, the share of maize crop went up substantially after 2005 due to improved productivity and prices. The area under food crops declined from 79.1 per cent in the 1960-63 triennium to 59.4 per cent of the GCA in 1990-93. The area under cereals declined from 60 per cent in 1960-63 to 43 per cent of the GCA in 2007-08 (Table 9 and Fig 3). Acreages of millet crops like sorghum and pearl millet and minor millets declined consistently. The reduction in the share of cereals was due to shrinkage in the area devoted to millets. Area under pulses which stood at 11 per cent during the early seventies increased to 18.3 per cent in 2007-10.

Table 9: Changes in Cropping Pattern (Triennium Averages)

Percent share in GCA

<i>Crop</i>	<i>1960-63</i>	<i>1970-73</i>	<i>1980-83</i>	<i>1990-93</i>	<i>2000-03</i>	<i>2007-10</i>
<i>Rice</i>	9.9	10.7	10.3	10.3	11.4	11.6
<i>Sorghum</i>	28.0	21.8	19.2	18.0	15.1	10.9
<i>Pearl millet</i>	4.8	4.6	5.4	3.3	2.7	2.6
<i>Maize</i>	0.1	0.7	1.4	2.3	5.3	9.0
<i>Finger millet</i>	9.6	9.8	9.8	8.8	7.7	6.4
<i>Wheat</i>	2.9	2.9	3.0	1.7	2.2	2.2
<i>Small millets</i>	4.2	4.1	3.2	1.1	0.6	0.3
<i>Total Cereals</i>	59.7	55.4	52.4	45.5	45.0	43.1
<i>Pigeon pea</i>	2.7	2.5	3.3	3.9	4.4	5.0
<i>Chick pea</i>	2.5	1.4	1.3	1.7	3.7	6.1
<i>Total Pulses</i>	11.9	11.0	13.2	13.8	16.9	18.3
<i>Food grains</i>	71.9	68.3	66.6	59.4	61.9	61.4
<i>Groundnut</i>	8.4	9.2	7.6	10.5	7.8	6.8

<i>Sunflower</i>	-	-	1.0	8.6	5.5	7.4
<i>Total oilseeds</i>	9.7	11.0	12.2	22.7	15.9	17.0
<i>Cotton</i>	9.3	10.2	9.0	5.0	4.4	3.3
<i>Sugarcane</i>	0.7	1.0	1.6	2.2	3.4	2.4
<i>Others*</i>	8.7	11.4	11.6	10.8	14.4	15.8
<i>GCA</i>	100	100	100	100	100	100

Note: Include tobacco, fruits and nuts, vegetables, coconut, arecanut, chillies and coffee

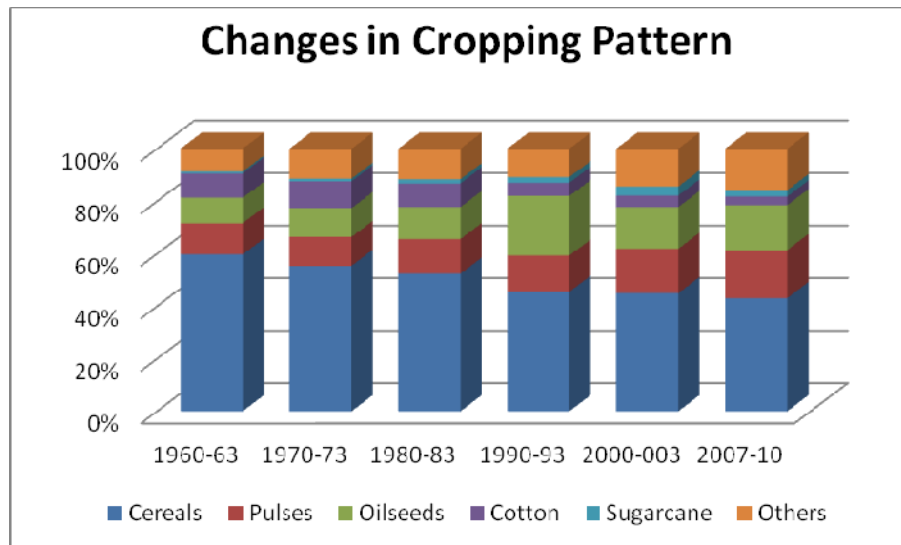
Source: Statistical Abstracts of Karnataka (various issues), Government of Karnataka

Oilseeds grew their share from around 10 to 11 per cent during the sixties and seventies to more than 20 per cent in early 1990s and it was 17 per cent of the GCA in 2007-10. The Technology Mission on Oilseeds introduced in the mid-eighties conditioned the expansion of area under oilseeds. Cotton occupied 9 per cent of the GCA in early 1980s but came down gradually to little more than 3 per cent of the GCA in 2007-10. Area under chickpea hovered around 1.5 per cent of the GCA between 1970s and 1990s, but rose to 6.1 per cent in 2007-10.

Similarly area under pigeon pea increased from 2.5 per cent in 1970-73 to 5 per cent in 2007-10. The area under other crops, which include fruits, vegetables and plantation crops, increased gradually from 11.4 per cent of GCA in the early seventies to 15.8 per cent in 2007-10.

Karnataka has a varied topographical character ranging from coastal plains to gentle slopes and the heights of the Western Ghats. The State is delineated into 4 sub-regions viz., 1. northern dry region, 2. central region, 3. southern region and 4. hills and coastal region. In the northern dry region, sorghum is the lead crop dominating the cropping system followed by cotton and pigeon pea. Maize and sugarcane are also important crops there. In the central region, ragi-based cropping system is predominant.

Fig. 3



In the hills and coastal region, the cropping system is rice based and there are some pockets in this region where ragi also forms an important component of the cropping system along with rice. The northern dry and central regions are the major producers of oilseeds. Groundnut is cultivated in the central region whereas sunflower and soybeans are popular in the northern dry region. Cotton, pigeon pea and other pulses are planted during kharif and sorghum is grown on residual moisture during rabi season on black cotton soils in the northern dry region. As expected, mixed or inter-cropping is practised more in the northern and central regions than in the southern region. Rice-rice rotations are common in irrigated areas of southern as well as coastal and hill regions. Sugarcane is grown in sizable areas in all the regions using canal irrigation. Sericulture is an important activity in the southern region and large areas are under mulberry cultivation. Coconut, arecanut, mango, grapes, sapota, citrus, etc. are the important fruit crops grown in the state. Karnataka is endowed with varied climatic conditions and has good potential for the development of horticulture and floriculture, which needs to be exploited for domestic and export markets. (*Kumar, P. Agricultural Performance and Productivity in Acharya, S.S and D. P. Chaudhri (eds) Indian Agricultural Policy at the Cross Roads*)

9. Annual Growth Rates of Area, Production and Productivity

The area under millets (sorghum, ragi and small millets) decelerated between 1990-91 and 1999-2000 as well as during 2000-01 and 2010-11. However, the decline in the area of millets was compensated by maize area which grew at more than 10 per cent per annum during the 1990s and by 9 per cent in the following decade (Table 10). Cereal production increased by 4.3 per cent per annum between 2000 and 2011 as against 3.4 per cent per annum during 1990 and 2000. The growth in cereal production was mainly due to the improvement in the yield of cereals which grew at 3 per cent per annum during 1990s and at 4 per cent between 2000 and 2011. The area under major pulses like chickpea and pigeon pea grew at a faster rate during 2001-2011 compared to the 1990-2000 period. Area under chickpea grew at a faster rate when compared with pigeon pea.

Table 10: Annual Growth Rates of Area, Production and Productivity

<i>Crop</i>	<i>1990-91 to 1999-2000</i>			<i>2001-01 to 2010-11</i>		
	<i>Area</i>	<i>Production</i>	<i>Yield</i>	<i>Area</i>	<i>Production</i>	<i>Yield</i>
<i>Rice</i>	1.72	3.64	1.89	1.66	2.83	1.15
<i>Sorghum</i>	-1.55	0.09	1.67	-3.76	2.10	6.09
<i>Pearl millet</i>	0.21	1.83	1.61	-0.20	3.36	3.57
<i>Maize</i>	10.25	10.49	0.21	8.63	10.60	1.81
<i>Finger millet</i>	-1.13	1.91	3.07	-2.38	0.29	2.74
<i>Wheat</i>	3.21	3.96	0.73	0.76	4.91	4.13
<i>Small millets</i>	-7.76	-8.08	-0.34	-10.66	-13.35	-3.01
<i>Cereals</i>	0.33	3.43	3.10	0.21	4.28	4.05
<i>Pigeon pea</i>	0.67	5.34	4.64	3.73	8.16	4.27
<i>Chick pea</i>	6.04	11.64	5.29	9.14	10.45	1.20
<i>Total Pulses</i>	0.68	3.44	2.75	3.01	6.26	3.15
<i>Food grains</i>	0.56	3.38	2.81	1.03	4.48	3.41
<i>Groundnut</i>	-1.32	-1.48	-0.17	-1.19	-2.03	-0.86
<i>Sunflower</i>	-6.49	-7.43	-1.01	0.56	2.50	1.93

<i>Total oilseeds</i>	-3.11	-2.13	1.01	-0.11	0.02	0.14
<i>Cotton</i>	-0.52	0.48	1.00	-0.84	7.56	8.47
<i>Sugarcane</i>	2.82	5.16	2.27	-0.50	-0.03	0.47

The area under foodgrains increased only modestly during the last two decades but the production of foodgrains rose by 3.4 and 4.5 per cent during 1990-2000 and 2001-2011 respectively. The growth in foodgrain production was the result of significant improvement in yield during the period under reference.

The area as well as productivity of groundnut came down during the last two decades resulting in – 2.03 per cent growth during 2001-11. Growth in the yield of sunflower decelerated during 1990s and coupled with the deceleration of area under sunflower, it resulted in a drastic reduction (7.43 per cent per annum) in the production of sunflower during 1990s. However, growth (1.93 per cent per annum) in yields during 2001-11 induced a modest growth (0.56 per cent) in area, resulting in 2.5 per cent growth in sunflower production during 2001-11. For cotton too, growth in area decelerated during the last two decades. However, growth in the yield of cotton has increased from 1 per cent in 1990s to 8.5 per cent per annum during 2001-11. The area as well as yield of sugarcane increased by more than 2 per cent per annum during 1990-2000 resulting in 5.16 per cent growth in production. Though there was a modest growth in sugarcane productivity during 2001-2011, area under sugarcane decelerated resulting in lower sugarcane production.

10. Average Area, production and Productivity of Major Crops

The total area under cereals increased from 53.27 lakh ha at TE 2003 to 54.46 lakh ha during 2007-10. Sorghum and small millets experienced reduction in the area whereas all other cereals registered a modest expansion between 2000/2003 and 2007/2010 (Table 11). Area under maize almost doubled during the reference period and so also the production. Productivity of maize increased from 2588 kg/ha in TE 2003 to 2729 kg/ha during TE 2010. Remunerative support price and market intervention operations taken up by the government of Karnataka for purchasing maize helped in area expansion under maize. Area under sorghum declined by more than 20 per cent but total production increased from 13.81 lakh tones in TE 2003 to 16.18 lakh tones during the TE 2010 due to 50 per cent improvement in the productivity. Pearl millet also experienced

improvement in the yield levels during 2007-10 over 2000-2003 period. The area under wheat increased marginally, productivity registered 18 per cent hike during the reference period between 200/03 and 2007-10.

Production of pulses increased to 11.18 lakh tones during TE 2010 as against 8.01 lakh tones during TE 2003. The increased production was contributed by 16 increase in the area and 20 per cent hike in productivity of pulses between 2000-2003 and 2007-10. It is interesting to note that area under chick pea increased more than 70 per cent despite stagnant yield levels. On the contrary, area under pigeon pea increased only by 19 per cent despite 39 per cent increase in the productivity during 2007-10. The productivity of pigeon pea increased from 409 kg/ha in TE 2003 to 569 kg during TE 2010.

Un-remunerative prices, uncertain rains and high cost of seeds have impinged upon the acreage under groundnut. Groundnut experienced decline in area as well as yield resulting in reduction in groundnut production in 2007-10. The area under sunflower increased from 6.46 lakh ha in 2000-03 to 9.40 lakh ha during 2007-10 and production increased by 60 per cent from 2.89 lakh tones to 4.62 lakh tones in 2007-2010. The total area under oilseeds increased marginally despite reduction in productivity of oilseeds resulting in marginal increase in the oilseed production during 2000-03 to 2007-10.

Table 11: Area, Production and Yield of Major Crops (TE 2003 and 2010)

<i>Crop</i>	<i>Triennium Ending 2003</i>			<i>Triennium Ending 2010</i>		
	Area	Production	Yield	Area	Production	Yield
<i>Rice</i>	13.52	31.57	2315	14.72	37.37	2539
<i>Sorghum</i>	17.86	13.81	773	13.78	16.18	1174
<i>Pearl millet</i>	3.19	1.85	553	3.34	2.32	676
<i>Maize</i>	6.33	16.53	2588	11.41	30.99	2729
<i>Finger millet</i>	9.14	13.80	1465	11.41	14.01	1723
<i>Wheat</i>	2.58	1.97	760	2.76	2.53	917
<i>Small millets</i>	0.65	0.38	585	0.32	0.14	445
<i>Total Cereals</i>	53.27	79.82	1485	54.46	103.54	1901
<i>Pigeon pea</i>	5.26	2.17	409	6.27	3.61	569

<i>Chick pea</i>	4.43	2.58	587	7.68	4.47	583
<i>Total Pulses</i>	20.00	8.01	401	23.16	11.18	483
<i>Food grains</i>	73.27	87.82	1191	77.62	114.72	1479
<i>Groundnut</i>	9.21	7.35	780	8.59	5.82	674
<i>Sunflower</i>	6.46	2.89	453	9.40	4.62	483
<i>Total oilseeds</i>	18.85	12.11	642	21.52	12.55	580
<i>Cotton</i>	5.18	6.00	1133	4.23	7.37	1983
<i>Sugarcane</i>	4.02	361.42	89639	3.08	266.70	86368

The production of cotton increased from 6 lakh tones in 2000-2003 to 7.37 lakh tones, a hike of 23 per cent despite reduction in the area. The increased production was solely contributed by yield improvement. The yield of cotton increased almost by 75 per cent during TE 2010 over 1133 kg per ha in 2000-2003. Area as well production of sugarcane declined by more than 20 per cent during TE 2010 when compared to TE 2003.

11. Input Use and Other Services

The use of inputs such as high-yielding crop varieties, chemical fertilizers, plant protection chemicals as well as farm machinery in agriculture has increased over the years which facilitated improvement in productivity and resulted in increased crop production.

a) Area under High-Yielding Varieties

The area under high-yielding varieties (HYVs) of major crops increased from 30.18 lakh hectares in 2000-01 to 38.54 lakh ha in 2005-06 and further to 41.44 lakh ha in 2009-10 (Table 12a). Area under HYVs grew at a faster rate between 2000-01 and 2005-06 than during 2005-06 to 2009-10. The area under HYV maize and wheat increased by more than 30 per cent whereas the area under HYV rice and sorghum recorded a modest increase of 1 and 2 per cent respectively during the five-year period from 2005-06 to 2009-10.

Table 12a: Area under HYV under Major Crops in Karnataka (Lakh ha)

Crops	2000-01	2005-06	2009-10
-------	---------	---------	---------

Rice	12.30	13.11	13.28
Sorghum	7.12	10.62	10.88
Pearl millet	4.19	4.15	2.93
Maize	6.57	9.19	12.32
Wheat	0	1.47	2.03
ALL	30.18	38.54	41.44

b) Changing Fertilizer Consumption

Expansion in irrigated area and coverage of high-yielding varieties resulted higher demand and use of chemical fertilizers in Karnataka. Total fertilizer consumption increased to 21.1 lakh tonnes by 2010-11 as against 12.5 lakh tonnes during 2001-02 (Table 12b). Consumption of phosphatic and potassic fertilizers was relatively higher when compared to nitrogenous fertilizers. The use of fertilizers increased from 103 kg per hectare in 2001-02 to 162 kg per ha during 2010-11.

Table 12b: Total and Per Hectare Consumption of Fertilizers

Year	Fertilizers used per hectare				Nutrient wise consumption			
	(In Kgs)				(In Lakh tonnes)			
	N	P	K	TOTAL	N	P	K	TOTAL
1991-92	30.1	23.6	13.4	67.1	4.5	2.9	1.7	9.1
2001-02	52.4	29.8	18	103.3	6.7	3.6	2.2	12.5
2005-06	58	33	26	117	7.5	4.4	3.4	15.3
2010-11	78	53	30	162	10.2	7	4	21.1

Source: GOK, Statistical Abstract of Karnataka, various issues

c) Pesticide Consumption

Use of plant protection chemicals (insecticides and pesticides) remained more or less stagnant and the technical grade material used hovered around 1,700 tonnes (except in 2006-07) despite the expansion in the area covered which increased from 38 lakh ha in 2005-06 to 73 lakh ha in 2009-10 (Table 12c).

Table 12c: Use of Pesticides and Total area covered

Year	Area Covered (Lakh ha)	Technical grade Material (Tonne)
2005-06	38.00	1698
2006-07	24.00	942
2007-08	58.50	1588
2008-09	70.00	1675
2009-10	73.00	1700

Source: GOK, Statistical Abstract of Karnataka, various issues

Awareness about the health hazards of pesticide use, introduction of integrated pest management practices and promotion of organic farming have resulted in reduced use of pesticide per unit area.

d) Seed

Availability and access to quality seeds are key factors in improving productivity and production of crops. Improved as well as hybrid seeds of various crops produced by private and public sector seed companies are available in the state. The state government has undertaken a programme of production and distribution of certified quality seeds from 2007-08. Under the seed replacement norms, seed replacement rates fixed for different agricultural crops during 2010-11 are (in per cent): cereals 23-34; pulses 23-26; oilseeds 15-87; cotton 17 and all hybrids 100. The seeds of 12 crops were distributed at subsidized prices under different programmes (Small and Marginal Farmers' Scheme, RKVY, PM's rehabilitation package, etc.). The production and distribution of certified quality seeds during 2007-08 through 2009-10 is presented in Table 12d.

Table 12d: Production and Distribution of Certified quality Seeds

(Quintals)

Particulars	2007-08	2008-09	2009-10	2010-11	2011-12 (Target)
Production	580950	707769	1087450	1128258	1145824
Distribution	919860	919976	1035123	1292765	1159575

GOK, Economic Survey of Karnataka 2011-12

e) Farm Machinery and Equipment

Traditionally, farming was carried out using bullock power and human labour. However, increasing cost of maintaining bullock pair, shortage of labour for farm operations and paucity of time induced farmers to adopt mechanization. Mechanization facilitates timely completion of farm operations with desired results and precision. It also helps in reducing the drudgery associated with different conventional operations. A large number of farm equipment and machinery are used in farming. However, we provide below (Table 12e) the number of major farm equipment and machinery based on a 2006-07 input survey report. Farm machinery and equipment are distributed to farmers under the centrally sponsored Scheme of Farm Mechanization being implemented under the Macro Management Mode of Agriculture. The farm mechanization programme is also implemented as the Karnataka Farm Mechanization Mission. Farmers get 50 per cent subsidy for farm machinery and equipment.

Table 12e: Farm Machinery and Equipment

Major Farm Machinery	Numbers
Power Operated Sprayer/Duster	166129
Diesel Engine Pump set	249721
Electric Pump set	1108284
Power Tiller	205710
Tractors Used For Agri Purposes	1759586
Power Thresher (Wheat, Paddy Multiple)	682071
Combine Harvesters Trailed Type	15442
Combine Harvesters Self Propelled	32341
Others	139555
Sprinklers Used For Irrigation	93959
Drip irrigation Sets	91719

Source: Input Survey, 2006-07

12. Horticulture

Karnataka is endowed with diverse agro-climatic conditions enabling it to grow a variety of horticultural crops such as fruits, vegetables, flowers, spices and plantation crops. The plantation and horticulture sector plays a vital role in the economy of the state. During the year 2009-10, horticulture crops covered an area of 18.99 lakh ha as against 17.64 lakh ha during 2007-08 (Table 13). Though the area under horticultural crops had a share of less than 15 per cent of the net cultivated area of the state, the income generated from the sector accounts for 40 per cent of the total income from the agriculture sector (NABARD, 2010). Karnataka is implementing the National Horticulture Mission (NHM) programme from 2005-06. The coverage of NHM increased from 15 districts in 2005-06 to 30 in 2010-11. The total area under horticultural crops has gone up by 12 per cent between 2007-08 and 2010-11 with area under fruit crops expanding by more than 25 per cent during the period.

Table 13: Area under Major Horticultural Crops

(Lakh hectares)

<i>Crops</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>	<i>2010-11*</i>
<i>Fruits</i>	2.99	3.18	3.60	3.79
<i>Coconut</i>	4.60	4.71	4.87	4.97
<i>Spices</i>	2.46	2.43	2.66	2.75
<i>Vegetables</i>	4.27	4.21	4.37	4.58
<i>Cashew</i>	0.70	0.70	0.70	0.73
<i>Flowers</i>	0.25	0.27	0.27	0.28
<i>Others</i>	2.37	2.50	2.52	2.57
<i>Total</i>	17.64	18.00	18.99	19.67

Note: * Anticipated

Source: GOK, Economic Survey, 2011-12

13. Animal Husbandry

Animal husbandry and dairy farming are important sources of supplementary income to farmers. Livestock also helps in reducing the variability in income of farm families and insulates them from risk. Animal husbandry contributes about 3 per cent to the GSDP of Karnataka and roughly 22 per cent to the state GSDP generated from agriculture as a whole. Karnataka is a leading state in milk production in the country and has a good network of milk co-operative societies, milk-chilling plants, veterinary hospitals, AI centres, etc. Karnataka ranks third in sheep population and sixth in egg production (GoK, 2012). The bovine (cattle and buffaloes) population of the state was 152 lakh in 1997, but declined to 135 lakh in 2003. However, as per the 18th Livestock Census, bovine population has increased to 148 lakh in 2007 (Table 14). The sheep and goat population in the state reached 157 lakh in 2007 from 117 lakh during the 17th Livestock Census of 2003, a 33 per cent growth during the five-year period. Poultry population in the state increased by more than 70 per cent between 17th and 18th Livestock Census.

Table 14: Livestock Population of Karnataka (2007)

(Nos. in Lakh)

Particulars	Livestock Census			
	1997	2003	2007	% change in 2007 over 2003
Cattle	108	95	105	9.40
Buffaloes	44	40	43	7.50
Goat and Sheep	129	117	157	33.05
Other Livestock	26	30	24	-20.00
Total Livestock	307	284	329	15.85
Poultry	214	244	424	73.77

Source: GOK, Economic Survey, 2011-12

There were 10,534 active dairy co-operative societies with 20.40 lakh active members as on September 2010. The State operates 22 dairy processing plants with a total capacity of 32.25 lakh litres per day and has 42 milk-chilling centres with a capacity of 15.15 lakh litres per day. Karnataka also has 5 product dairies with a capacity to produce 92 MT of milk powder per day. Karnataka has 362 veterinary hospitals, 1,940 veterinary dispensaries, 1,181 veterinary centres and 174 mobile veterinary centres (GoK, 2011-12).

14. Fisheries

Karnataka has a 300-km coastline with a continental shelf of 27,000 sq km and 5.60 lakh hectares of inland waters. This provides immense scope for the development of fisheries. In addition to this, about 8,000 ha of brackish water area provides good scope for shrimp farming. The total fish production in Karnataka was around 2 lakh tonnes in the early eighties and reached more than 5 lakh tonnes in 2010-11, of which 60 per cent was contributed by the marine sector and 40 per cent by the inland fisheries sector (GoK, 2011-12). The growth in marine and inland fish production is presented in Table 15.

Table 15: Fish Production in Karnataka

(Lakh MTs)

Year	Marine	Inland	Total
2000-01	1.78	1.27	3.05
2005-06	1.77	1.21	2.98
2006-07	1.68	1.24	2.92
2007-08	1.76	1.22	2.98
2008-09	2.18	1.44	3.62
2009-10	2.49	1.59	4.08
2010-11	3.41	1.86	5.27

Source: GOK, Economic Survey, 2011-12

15. Storage, Godowns and Markets

It is estimated that about 6 per cent of the foodgrains and roughly 30 to 40 per cent of the horticulture produce, mainly fruits and vegetables, are lost due to non-availability of proper storage facilities. This affects the post-harvest management of agricultural and horticultural produce. Lack of storage facilities creates a glut in the market during the harvest season and producers are compelled to sell their produce at lower prices. The storages and godowns are operated by private as well as public sector companies. The Karnataka State Warehousing Corporation has a storage capacity 9.04 lakh MT, of which 4.97 lakh MT is owned and 4.07 MT is hired. Similarly, there are 157 cold storages owned by private, co-operative and public sector units with a capacity of 3.97 lakh MT (GoK, 2012).

Most of the agriculture produce in the state is marketed by the Agriculture Produce Marketing Committee (APMCs) yards. There are 504 regulated markets in the state, of which 151 are main markets and 353 sub-markets. The density of regulated markets for agriculture produce varies across the districts and it ranges from 6 markets in Bangalore rural and Udupi to a maximum of 47 markets in Belgaum. The total turnover in the regulated markets is around Rs 22,455 crore per annum.

16. Agricultural Credit

The State of Karnataka has a good banking network of commercial banks, RRBs and co-operatives. Currently, 27 public sector banks, 16 private commercial banks and six regional rural banks are operating in the state. The growing demand for institutional finance has resulted in the expansion of banking network and credit flow. There were 755 bank branches at the time of nationalization in 1969 and the number reached 7,268 by March 2011. Among the total number of bank branches, 5,122 are commercial banks, 1,256 rural regional banks and the remaining 890 branches of co-operative banks (NABARD, 2011). The rural and semi-urban branches account for 38.61 per cent and 20.57 per cent respectively of the total 7,268 bank branches in Karnataka.

Disbursement of credit in rural areas takes place through co-operatives, commercial banks and regional rural banks. The total crop loans disbursed increased from Rs 6,454.84 crore in 2005-06 by more than 60 per cent to Rs 10,592.32 crore during 2009-

10 (Table 16 and Fig. 4). The targets set for disbursement of crop loans were fulfilled from 2005-06 to 2007-08. However, there was a gap of 17 and 10 per cent between the targets and achievements in crop loan disbursement during 2008-09 and 2009-10, respectively.

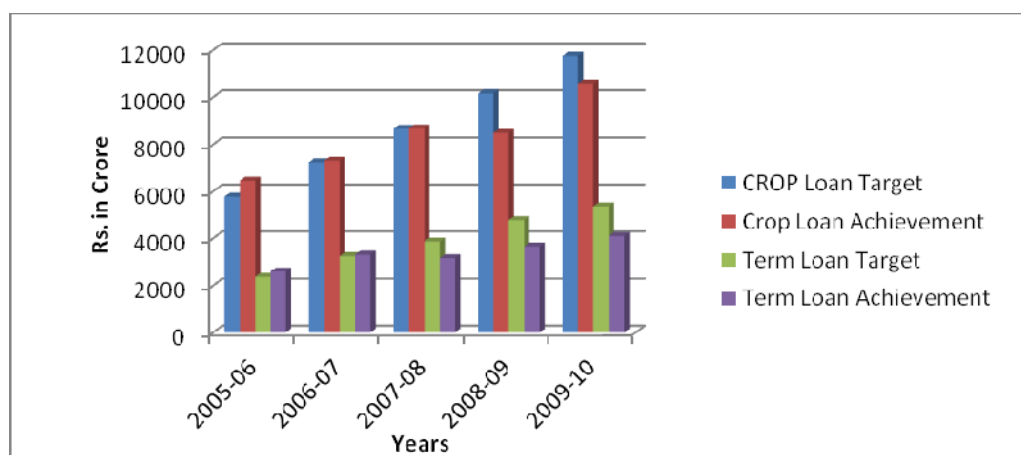
Actual disbursement of term loans for agriculture increased from Rs 2,598.09 crore in 2005-06 to Rs 4,094.21 crore in 2009-10. The targets fixed for disbursement of term loans for agriculture were achieved or exceeded during 2005-06 and 2006-07, but from 2007-08 the achievements have fallen short of targets. There is a gap of 20 to 25 per cent between the targets and actual disbursement of term loans from 2007-08 to 2009-10.

Table 16: Ground Level Credit Flow to Agriculture Sector – Targets and Achievements

Rs crore					
<i>Category</i>	<i>2005-06</i>	<i>2006-07</i>	<i>2007-08</i>	<i>2008-09</i>	<i>2009-10</i>
<i>Crop Loan</i>					
<i>Target</i>	5773.86	7246.90	8665.52	10161.86	11765.92
<i>Achievement</i>	6454.84	7302.79	8676.38	8483.38	10592.32
<i>Agricultural Term Loan</i>					
<i>Target</i>	2367.58	3244.74	3865.99	4779.66	5366.39
<i>Achievement</i>	2598.09	3308.79	3157.84	3661.02	4094.21
<i>Total Agricultural Credit</i>					
<i>Target</i>	8141.44	10491.64	12531.51	14941.52	17132.31
<i>Achievement</i>	9052.93	10611.58	11834.22	12144.40	14686.53

Source: NABARD, State Focus Paper, 2011-12, Karnataka.

Fig. 4. Ground Level Credit Flow to Agriculture Sector



17. State domestic Product

The Gross State Domestic Product (GSDP), which was Rs 270,629 crore during 2007-08, rose to Rs 345,236 crore in 2009-10 and touched Rs 465,552 crore (current prices) in 2011-12 (Table 17). The per capita income (in current prices) increased from Rs 47,237 in 2007-08 to Rs 69,493 during 2011-12. Agriculture took a share of 16.94 per cent of the State GSDP in 2011-12 as against 17.04 per cent in 2007-08. Surprisingly, the share of industrial sector also indicated a declining trend over the years and its contribution declined from 31.81 per cent in 2007-08 to 27.74 per cent of the State GSDP in 2011-12.

Table 17: Sectoral shares of GSDP for Karnataka (Current Prices)

Industry	2007-08	2008-09	2009-10	2010-11	2011-12
Agriculture	17.04	15.87	16.25	16.78	15.94
Industry	31.81	31.34	29.27	28.6	27.74
Services	51.15	52.8	54.48	54.61	56.32
Total	100	100	100	100	100

(Rs in Crore)

(270629)

(310312)

(345236)

(405123)

(465552)

Source: GoK, Economic Survey, 2011-12

The sectoral growth rates during this period for agriculture and allied activities, industry and services are 5.7 per cent, 5.3 per cent and 10.3 per cent, respectively. In general, the trends in the annual growth rate of GSDP correspond to the growth rates of industry and service sectors, and the State GSDP grew at 8.0 per cent per annum between 2007-08 and 2011-12. At the same time, per capita GSDP is expected to increase from INR 42,914 (USD 869.6) in 2009-10 to INR 45,962 (USD 931.3) in 2010-11 or about 7%. The growth of GSDP is comparable with that of all-India level. (GOK, 2012).

18. Impediments to Growth

The agro-climatic character of the state divides it into varied agro-climatic zones. This influences the cropping pattern and cultivation practices followed across the regions. Similarly, the resource endowment and delivery system of inputs also differ across the regions. Broadly, one can divide Karnataka into five zones based on agrarian and agro-ecological systems, namely, Bombay Karnataka zone, Hyderabad Karnataka zone, Southern dry zone, Southern irrigated zone and Western coastline. Among these regions, the un-irrigated plateau zones of Northern Karnataka and Southern Karnataka are the main lagging regions of the state. Investment from public and private sources in these two regions remained at the lowest rung in the development ladder (GoK, 2003) and failure to bring investment to the rural areas of these two regions has caused impediments to spur growth. Hitherto, agriculture was considered the only alternative to bring these regions into mainstream growth, but climatic conditions and resource endowments do not support such an initiative. On the contrary, weather-induced instability continues to inflict misery on farmers in these areas. However, it has been observed that horticultural crops have been picking up both in terms of area as well as productivity in these regions.

The major challenges faced by agriculture in Karnataka are: threat of stagnation in agriculture growth with possibility of decelerating growth, low value-addition in agriculture, fast approaching optima on technological front, large proportion of rain-fed /

dry land area, marginalization of agricultural land base, inadequate growth in public and private investment, regional disparities in investment, low technology adoption and growth, inadequate and inefficient safety nets and finally, conflicting demands of growth versus environmental protection (GOI, 2004). To resolve these issues, it is imperative to focus on rain-fed agriculture, develop initiatives for small and marginal farmers, rebuild natural resource base by promoting an organic approach to farming and develop key infrastructure to provide a boost to growth momentum.

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