

**REPORT ON THE SURVEY CONDUCTED FOR
CONCURRENT ESTIMATION OF COCONUT
PRODUCTION IN THE STATE OF
KARNATAKA FOR 2012-13**



**COCONUT DEVELOPMENT BOARD, MINISTRY OF AGRICULTURE,
GOVT. OF INDIA[**

1. Contents

1.	INTRODUCTION	3
2.	OBJECTIVES OF THE SURVEY	4
3.	SAMPLE DESIGN	4
4.	SAMPLE SIZE	4
5.	ORGANISATIONS	5
6.	PROFORMA	5
7.	CONCEPTS AND DEFINITION	5
8.	COVERAGE	6
9.	SAMPLE SELECTION	7
10.	TRAINING TO FoCT AND FIELD INVESTIGATORS	7
11.	SUPERVISON	7
12.	SURVEY PERIOD	7
13.	ESTIMATION	8
13.1	FORMULAE	8
14.	Findings –District wise	8
14.1	Chikkamagaluru	8
14.2	Dakshina Kannada	9
14.3	Hassan	10
14.4	Mandya	10
14.5	Mysore	11
14.6	Tumkur	12
14.7	Udupi	12
15.	Findings –State	13
16.	Findings at a glance	21
17.	GENERAL OBSERVATIONS:	23
18.	References	24

1. INTRODUCTION

Agriculture sector contributes for about 14% of the nation's GDP, about 11% of its exports earnings and half of the population still relies on agriculture for their employment and as its principal source of income.

Coconut palm provides food security and livelihood to large size of population in the world particularly in Asia Pacific Countries. Considering the versatile nature of the crop and the multifarious uses of its products, coconut palm is eulogized as KALPAVRIKSHA (Tree of Heaven). Coconut is a source of food, beverage, medicine, natural fiber, fuel, wood and raw materials for units producing a variety of goods. Coconut is also interlinked with socio economic life of large number of small and marginal farmers in the peninsular India. It is estimated that about 12 million people in India are dependent on the coconut sector in areas of cultivation, processing and trading activities. With an annual production of around 21,892 million nuts, coconut contribution to nation's GDP is about 15,000 crores rupees.

The Coconut (*Cocos nucifera*) is a benevolent tree, a nature's gift to mankind. The coconut tree provides clothing, utensils and shelter therefore, is an important source of earning livelihood to the people of coconut growing states. The coconut crop is grown in 12.2 Million hectares of land which constituted about 0.7% of net crop area of the world. India contributes about 15.46% in area and 26.34% in terms of production of coconut in the world. The major coconut crop acreage is concentrated in the states of Kerala, Karnataka, Tamil Nadu and Andhra Pradesh. Karnataka stands second in area (507 thousand hectare) and production (5893 million nuts).

State has the production of 44083 lakh nuts with an area of 443384 ha.(Table 16.1). Tumkur is noticed to be the largest producer of coconut with the production of 13496 lakh nuts, followed by Hassan and Chitradurga. These three districts together has a crop area of 247986 ha. Production of coconut from Tumkur district is 30.6%, followed by Hassan which contributes 14.1% of the state area under coconut and production.

The official statistics on area and production of coconut is released by the Directorate of Economics and Statistics (DES) in Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. In other states like Maharashtra, Gujarat, Odisha and UTs coconut production estimation is exercised by Agriculture or Horticulture Department of State Governments. The All India final estimate of area and production of coconut were officially released by the Directorate of Economics and Statistics under the Ministry of Agriculture & Cooperation, Government of India until 2008-09. Thereafter the mandate was shifted to the Horticulture Division under the Ministry of Agriculture, Government of India

It is observed that the release of official data by the State DES/Agri/ Hort Departments has a two years lag. Whereas, availability of concurrent data on coconut production is critical for informed decision making on many policy issues related to the crop and its development programmes including declaration of Minimum Support Price

fixation. Hence it was felt appropriate to have a concurrent estimation of coconut production by the Coconut Development Board itself. Further the Board has been advised by the Ministry of Agriculture for undertaking an advance production estimation of coconut. Accordingly Coconut Development Board took a decision in its 111th Board meeting held on 15.09.2012 for undertaking a production estimation survey in 31 major coconut growing districts of Kerala, Karnataka, Tamil Nadu and Andhra Pradesh for the agriculture year 2012-13.

Sample survey to estimate the production of coconut in Karnataka for the year 2012-13 was conducted during the months from January to June, 2013. The actual enumeration of selected sample holdings was done during February, 2013 in Udupi and Dakshina Kannada, April 2013 in Mandya and Mysore and May, 2013 in Tumkur, Hassan and Chikmagalur districts. Coconut yield pertaining to Agri. Year 2012-13 was collected by actual counting of fruits in the respective bunches and annual yield is estimated by extrapolating this data based on monthly production distribution pattern.

This is the first attempt of Coconut Development Board in this direction to conduct a field survey for the concurrent estimation of coconut production in the major coconut growing states in India. The study was carried out by Coconut Development Board in collaboration with Educational/Research Institutions.

2. OBJECTIVES OF THE SURVEY

- *To estimate the production of coconut in the major coconut growing states in India viz. Kerala, Karnataka, Tamil Nadu and Andhra Pradesh for 2012-13 by undertaking field surveys*
- *To develop a scientific model for predicting the coconut production in the country 6-10 months in advance.*

3. SAMPLE DESIGN

Multistage sampling method is used for the selection of holdings/gardens for collecting the primary data. Districts are selected based on area under coconut cultivation as the only criteria. Minimum cut off area for selecting a district in Karnataka state was 14000 ha. Villages were selected based on statistical sampling technique. From each village, required holdings having minimum of 40 bearing palms were selected. For yield estimation from each holding, 10 palms are selected at random and bunch wise yield data was recorded.

4. SAMPLE SIZE

Even though the study was conducted in 8 districts, data collected from one district viz. Chitradurga was not considered for analysis, as the collection of data was done during the end of Agriculture year 2012-13. Total area under coconut cultivation in the 7 districts is 330112 ha according to latest data released by DES Karnataka (2011-12). Out of which the sample area covered under the survey is **1010.87 ha.**, which is 0.31% of the total area under selected districts. 894 sample holdings were selected from these seven districts and 8940 palms were surveyed for recording yield data.

5. ORGANISATIONS

Coconut Development Board is an autonomous body under Ministry of Agriculture, Government of India. It was established under Coconut Board Act 1981 passed by Indian Parliament. Coconut Development Board was in overall charge of the survey for technical guidance as well as administrative control. All the preliminary works related with the study viz. planning the survey, selection of states/districts/blocks, technical instructions, training of the field staff were done by statistics section of Coconut Development Board with the help of Regional Offices in Bangalore.

For the successful conduct of the study in field level, Board collaborated with Educational/Research Institutions in each sample district. Coordinators/Principle Investigators from institution side was in complete charge of enumeration work, field supervision, data entry and analysis of results. For collection of data on yield (counting of nuts in bunches), services of trained coconut climbers (Friends of Coconut Tree) were utilised.

List of institutions collaborated with Coconut Development Board in the study is given in the table below.

Table 5.1

Sl.No	District	Institution	Coordinator
1	Tumkur	UAS, Bangalore	Dr.G.B.Mallikarjuna
2	Chitradurga	-do-	-do-
3	Mandya	College of Agri., VC Farm, Mandya	Dr.G.R.Denesh
4	Mysore	-do-	-do-
5	Hassan	Agricultural College, Hassan	Dr.G.M.Gaddi
6	Chikkmagaluru	-do-	-do-
7	Udupi	Govt. College, Kasaragod	Dr.K.K.Hari Kurup
8	Dakshina Kannada	-do-	-do-

6. PROFORMA

For collecting field level information from selected holdings a single proforma was designed, which is divided into four parts. First part relates with general information of the selected holding and second part with personal details of the coconut farmer. Third part is to record information about the coconut holdings viz. number of bearing and non bearing palms, Management Practices, Cropping Pattern etc. and the last part is for the bunch wise yield data pertaining to the 10 palms selected.

7. CONCEPTS AND DEFINITION

Holding : A coconut cultivated plot (extend of land) owned by a single person is considered as a plot if a minimum of 20 bearing coconut trees irrespective of their age and variety exists in the plot.

Bearing palms: Coconut palms which have attained fruit bearing stage at the time of enumeration are classified as yielding palms.

Non- Bearing palms : Coconut palms which have not attained fruit bearing stage at the time of enumeration and palms which have reached bearing stage, but not bearing, due to reasons like sterility, disease, old age etc. are classified as non- bearing palms

Yield: A measurement of output (coconuts) obtained or harvested from coconut tree.

Palm Density: The number of plants standing within a given unit of area (here the unit area taken isHa).

Yielding Palm Density: The number of Yielding plants within a given unit of area (here the unit area is taken Ha).

Mono Cropped : In any holding only coconut is cultivated or the major crop is coconut

Mixed cropped: In any holdings if coconut is grown along with one or more other tree crops.

Rainfed and Irrigated: A holding was considered to be rainfed in case the holding solely depends on rainfall to meet requirements of water to trees and considered as irrigated in case water is supplied to trees in summer season/in the absence of rain.

8. COVERAGE

Of the 30 districts in Karnataka, coconut cultivation is mainly concentrated in 10 districts. From these 10, the major 7 districts were selected, based on the area under coconut cultivation. The districts selected, and sample area covered is given in the table below:

Table 8.1

SI No	Districts	Area under Coconut cultivation(Ha)	Sample Area (Ha)	Percentageof area covered
1	Tumkur	142880	630.85	0.44
2	Hassan	62575	134.03	0.21
3	Chikmaglur	38113	106.58	0.28
4	Mandya	26727	44.05	0.16
5	Mysore	26280	45.82	0.17
6	Udupi	17460	26.35	0.15
7	Dakshina Kannada	16077	23.19	0.14
		330112	1010.87	0.31

Source: DES Karnataka 2011-12 data, survey data - sample area

9. SAMPLE SELECTION

From the seven districts selected, a total number of 27 blocks were selected which are the major coconut cultivated blocks. From these blocks, 51 Panchayats were selected at random and the required number of 894 coconut holdings for enumeration were distributed among these Panchayats. District wise allocation of villages/panchayats and holdings are shown in the table below.

SI.No	Distict	No. of Taluks	No.of Panchayats	No.of Holdings	No. of trees
1	Tumkur	3	9	387	3870
2	Hassan	2	8	180	1800
3	Chikkmagaluru	2	4	105	1050
4	Mandya	7	11	71	710
5	Mysore	5	11	61	610
6	Udupi	3	3	45	450
7	Dakshin Kannada	5	5	45	450
	State	27	51	894	8940

10. TRAINING TO FoCT AND FIELD INVESTIGATORS

Before the start of the actual survey, one day on field training was imparted to Field Investigators on how to select the palms at random, as well as to FoCTs (Friends of Coconut Tree), on how to record the yield data on a chronological order from 3 month old bunches to more than 8 months old bunches.

11. SUPERVISION

In order to improve the quality of field work, the enumeration was supervised on a regular basis from the Institution side by Investigator/Associate and random check done from Boards side. The entire survey work in Karnataka was supervised by Regional Office, Coconut Development Board, Bangalore and coordinated by Coconut Development Board, Headquarters, Kochi.

12. SURVEY PERIOD

The enumeration work in Udupi and Dakshina Kannada districts was done in February, Mandya and Mysore districts during April and Tumkur, Hassan, Chikkmagaluru districts, during May 2013.

13. ESTIMATION

The main purpose of analysis of data was to arrive at estimate of yield and yield per palm and per hectare basis which is required for estimating production with a reasonable degree of accuracy. From the observations recorded, the number of nuts ready to be harvested upto June, 2013 (in the Agri. Year 20112-13), only was considered for the estimation of yield. This observations from all the palms surveyed was considered to obtain average yield. This yield was extrapolated to annual yield based on the month in which the data was recorded. The annual yield divided by number of bearing palms in the sample indicates the yield per palm. Further, yield per Ha. is arrived at by multiplying average yield per palm with yielding palm density. Production for 2012-13 was estimated by multiplying area under coconut with the yield per Ha. The following formulae were used in the estimation of coconut production.

13.1 FORMULAE

Average holding size = Total coconut cultivated area (Ha) in the sampling area / Total No of holdings (Count) in the sampling area

Average palm density = Total number of coconut palms (Count) / Coconut cultivated area (Ha)

Area yielding palm density = Total number of yielding coconut palms (Count) / Coconut cultivated area (Ha)

Average yield per palm = Total number of coconut nuts obtained in a year (Count) / Total number of yielding coconut palms (Count)

Average yield /ha = Average per palm yield X yielding palm density

14. Findings –District wise

14.1 Chikkamagaluru

Coffee was first cultivated in India in Chikkamagaluru. Mullayanagiri, which is the highest peak in Karnataka, is located in the district. It is also a tourist's paradise containing hill stations and waterfalls like Manikyadhara, Hebbe and Kallathigiri. The district borders Shimoga district to the north, Davangere district to the north-east, Chitradurga and Tumkur districts to the east, Hassan district to the south, Dakshina Kannada district to the south-west and Udupi district to the west. The district is rich in iron, magnetite and granite deposits. Black soil is found around hilly areas whereas Red and Gravel soil are found in the southern parts of the district.

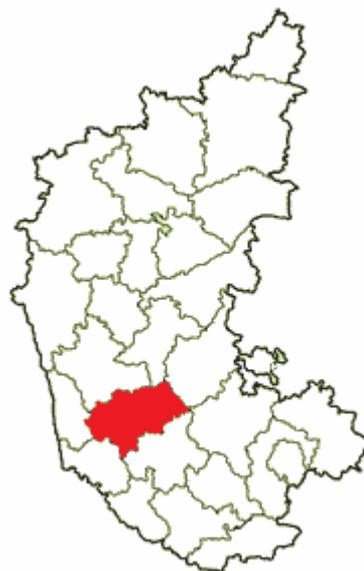


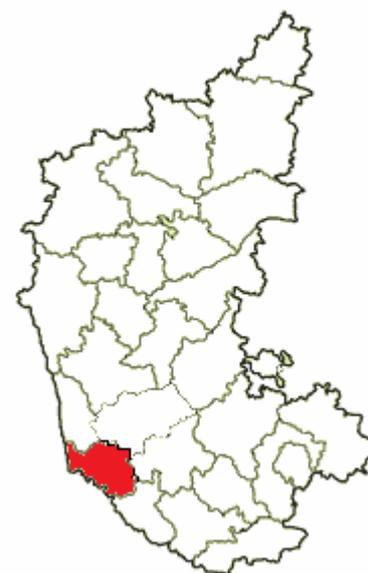
Table 14.1

Average annual rainfall	1903 mm
Main plantation crops	Coconut, Arecanut
Main field crops	Raggi, Paddy, Sunflower
Main Horticulture crops –Fruits	Mango, Banana, Sapodilla
Soil	Red sandy loam, Laterite, Alluvial, Red clay, Deep black
Contingencies prone to	Drought, Cold wave (Occasional),

Area under coconut cultivation in Chikkamagaluru constitutes to 9% of total area under coconut cultivation in the state. Out of the 7 taluks in Chikmagalur, two Talukas viz. Kadur and Tarikere were selected for the study. Kadur has the maximum area under coconut cultivation in the district and constitutes to about 76% of the total coconut cultivated area. Average holding size as per survey findings is 1.02 Ha. Coconut palm density for the district is found to be 107 per Ha., where as the bearing palm density is 88 per Ha. Bearing palms in the sample gardens selected constitute to 82 per cent of the total palms. Based on the data collected the annual per palm yield in the district is estimated as 31 nuts and per hectare yield as 2728 nuts and production of coconuts in Chikamagalur for 2012-13 is estimated to be 1040 lakh nuts.

14.2 Dakshina Kannada

Dakshina Kannada, also known as South Kanara, is a coastal district in the state of Karnataka. It is bordered by Udupi District to the north, Chikkamagaluru district to the northeast, Hassan District to the east, Kodagu to the southeast, and Kasaragod District in Kerala to the south. The Arabian Sea bounds it on the west. Mangalore is the headquarters and main city of the district. The district comprises of five talukas viz. Mangalore, Bantwal, Puttur, Sullia, and Belthangady. Unlike other villages of India, where group of houses surrounded by farm fields make a village, In Dakshina Kannada district, houses are in the middle of farm field or garden or plantation of coconut or arecanut.

**Table 14.2**

Average annual rainfall	3559 mm
Main plantation crops	Coconut, Arecanut, Cashew
Main field crops	Paddy, Blackgram, Greengram
Main Horticulture crops –Fruits	Mango, Banana, Jackfruit
Soil	Red laterite, Sandy loam
Contingencies prone to	Drought, Flood, Cyclone, Sea water intrusion (Occasional),

Dakshina Kannada contributes to 4% of total area under coconut cultivation in the state. This is the eighth district in Karnataka as far as cropped area under coconut is concerned. The district comprises of 7 taluks, of which Belthangadi has the maximum area under coconut cultivation in the district and constitutes to about 32% of the total coconut cultivated area. Average holding size as per survey findings is 0.51 Ha. Coconut palm_density for the district is found to be 152 per Ha., where as the bearing palm density is 138 per Ha. Bearing palms in the sample gardens selected constitute to 90 per cent of the total palms. Based on the data collected the annual per palm yield in the district is estimated as 56 nuts and per hectare yield as 7728 nuts and coconut production in Dakshina Kannada for 2012-13 is estimated to be 1244 lakh nuts.

14.3 Hassan

Hassan is a major coconut growing district in Karnataka state. Hassan is also famous as the location of the Master Control Facility of the Indian Space Research Organization's Indian National Satellite System. It is divided into 8 taluks, 38 hoblies & 2369 villages. The district is bordered by Chikmagalur District in the north west, Chitradurga District in the north, Tumkur District in the east, Mandya District in the south east, Mysore in the south, Kodagu District in the south west and Dakshina Kannada district in the west. Tourism and Coffee are the two main sources of income of Hassan district. Shri. H.D.Deve Gowda, the 14th Chief Minister of Karnataka and 11th Prime Minister of India hails from this district.

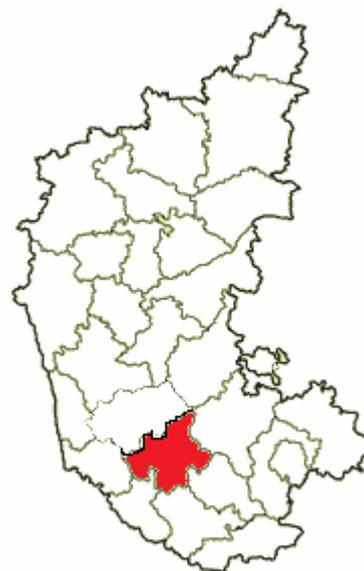


Table 14.3

Average annual rainfall	1031 mm
Main plantation crops	Coconut, Arecanut, Cashew
Main field crops	Paddy, Raggy, Maize
Main Horticulture crops – Fruits	Mango, Banana, Sapodilla
Soil	Very deep red, Medium deep red, Gravelly
Contingencies prone to	Drought, Pest & Diseases (Occassional)

Hassan has the second largest coconut area in the State. Nearly 14% of area under coconut cultivation in Karnataka is from this district. The district comprises of 8 taluks, of which Arisekere and Channarayapatna were selected under the study. Of the 8 Taluks in Hassan, Arisekere and Channarayapatna contributes maximum towards the coconut production in the district (almost 81%). Average holding size as per survey findings is 0.74 Ha. Coconut palm density for the district is found to be 141 per Ha., where as the bearing palm density is 106 per Ha. Bearing palms in the sample gardens selected constitute to three fourth of the total palms. Based on the collected data the annual per palm yield in the district is estimated as 39 nuts and per hectare yield as 4134 nuts and production of coconuts in Dakshina Kannada in 2012-13 is estimated to be 2587 lakh nuts.

14.4 Mandya

Mandya is a prominent agriculture district in the state of Karnataka. Mandya district is bounded on the south by Mysore district, on the west by Hassan district, on the north by Tumkur district and on the east by Ramanagara district. The district was formed in the year 1939. The mythical story about the name is that the region is named after a sage called Maandavya, Mandya district comprises of 7 Talukas. Srirangapatana, Nagamangala and K.R.Pet are the major coconut growing Talukas Since Mandya is located on the banks of the river Cauvery, agriculture is the dominant occupation and is the single largest contributor to its economy. Demonstration cum Seed Production Farm of Coconut Development Board in Karnataka is located in Mandya district.

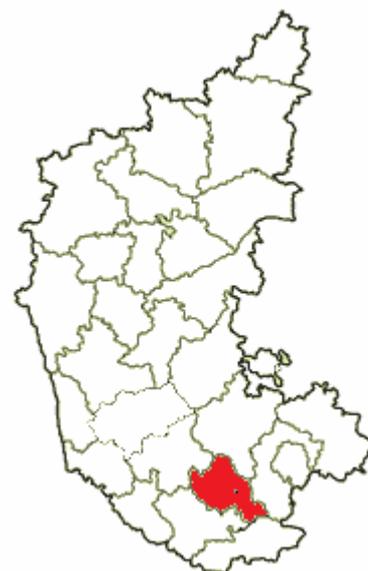


Table 14.4

Average annual rainfall	700 mm
Main plantation crops	Coconut, Arecanut
Main field crops	Paddy, Raggy, Sugarcane
Main Horticulture crops –Fruits	Mango, Banana, Sapodilla
Soil	Red gravelly, Red sandy loam, Red sandy
Contingencies prone to	Drought, Flood & Cyclone (Occasional), Pest & Disease(Regular)

Mandya is the fifth largest district in Karnataka as far as area under coconut cultivation is concerned. Nearly 6% of area under coconut cultivation and more than 8% of coconut production in Karnataka is from this district. Average holding size as per survey findings is 0.62 Ha. Coconut palm density for the district is found to be 119 per Ha, where as the bearing palm density is 107 per Ha. Bearing palms in the sample gardens selected constitute to 90 per cent of the total palms. Based on the collected data the annual per palm yield in the district is estimated as 86 nuts and per hectare yield as 9202 nuts, which is the highest among all the districts selected for the study. Estimated coconut production for Mandya in 2012-13 is estimated to be 2459 lakh nuts.

14.5 Mysore

Mysore District is located in the southern part of the state of Karnataka and the third largest city in the state. The district is bounded by Mandya district to the northeast, Chamrajnagar district to the southeast, Kerala state to the south, Kodagu district to the west, and Hassan district to the north. It features many tourist destinations, viz. Mysore Palace to Nagarhole National Park. Mysore's prominence is visible from the fact that Karnataka state was known previously as Mysore state. The district lies on the land of the southern Deccan plateau, within the watershed of the Kaveri River, which flows through the northwestern and eastern parts of the district. Agriculture is the backbone of the economy of this district like many in other parts of India. Agriculture is highly dependent on rainfall. Additional requirement of water for irrigation is provided by the rivers Kaveri and Kabini. According to the 2001 census, about 3,25,823 farmers are involved in cultivation in this district. Horticulture is another area contributing significantly to the economy; especially the palm oil production in Heggadadevanakote Taluk. Mysore District is subdivided into seven taluks viz. Piriapatna, Hunsur, Krishnarajanagara, Mysore, Heggadadevanakote, Nanjangud and Tirumakudalu Narasipura.

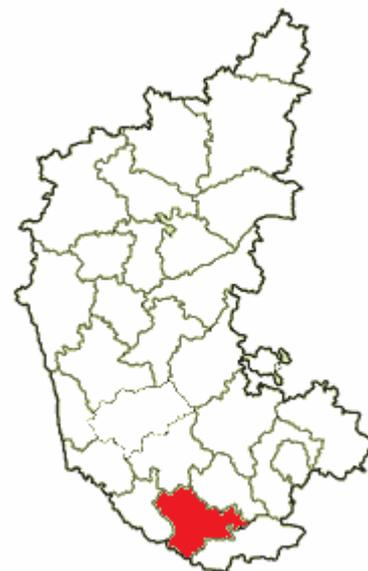


Table 14.5

Average annual rainfall	782 mm
Main plantation crops	Coconut
Main field crops	Paddy, Raggy, Maize, Cotton
Main Horticulture crops –Fruits	Mango, Sapodilla
Soil	Deep red and loamy, Red sandy loam, Black
Contingencies prone to	Drought, Flood (Occasional), Pest & Disease(Regular)

Mysore is the sixth largest district in Karnataka as far as area under coconut cultivation is concerned. More than 6% of area under coconut cultivation and 5% of coconut production in Karnataka is contributed by this district. Of the seven Taluks, 5 were selected for the study. Average holding size as per survey findings is 0.75 Ha. Coconut palm density for the district is found to be 115 per Ha, where as the bearing palm density is 106 per Ha. Bearing palms in the sample gardens selected constitute to 92 per cent of the total palms. Based on the data collected under the study, annual per palm yield in the district is estimated as 83 nuts and per hectare yield as 8798 nuts, which is the second highest among all the districts selected for the study next to Mandya. Production of coconuts in Mysore in 2012-13 is estimated to be 2312 lakh nuts.

14.6 Tumkur

Tumkur district is located in the eastern belt in the southern half of the State. The district is bounded on the north by Anantpur district of Andhra Pradesh, on the east by the districts of Kolar and Bangalore, on the south by Mandya district and on the west and north-west by the districts of Hassan and Chitradurga. Tumkur district is surrounded on all sides by lands belonging to the neighboring districts and has no natural boundary such as sea, river or mountain ranges on any side. Tumkur has an industrial town. The mineral wealth of Tumkur is considerable. Iron is obtained in large quantities from the hillsides and excellent building-stone is also quarried. The district is subdivided into 10 Talukas viz. Koratagere, Gubbi, Chikkanayakana Halli, Tumkur, Pavagada, Sira, Turuvekere, Kunigal, Madhugiri and Tiptur.

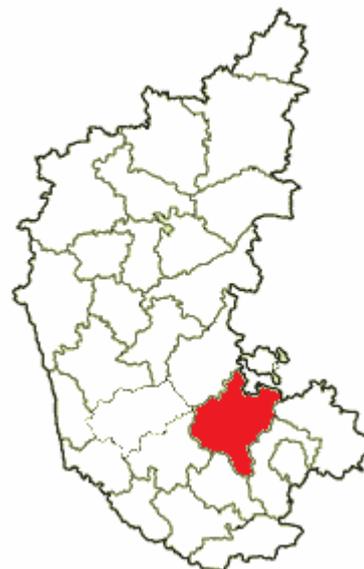


Table 14.6

Average annual rainfall	593 mm
Main plantation crops	Coconut, Arecanut
Main field crops	Paddy, Raggy, Ground nut
Main Horticulture crops – Fruits	Mango, Banana, Sapodilla
Soil	Red, Sandy, Sandy loam, Black
Contingencies prone to	Drought (Regular)

Tumkur is the largest coconut producing district in Karnataka. Nearly one third of area under coconut cultivation and production in Karnataka is contributed by this district alone. Of the ten Taluks three viz. Gubbi, Turuvekere and Tipur were selected for the study. Samples were equally distributed between the Taluks. Average holding size as per survey findings is 1.63 Ha. Coconut palm density for the district is found to be 133 per Ha, where as the bearing palm density is 125 per Ha. Bearing palms in the sample gardens selected constitute to 94 per cent of the total palms. Based on the collected data the annual per palm yield in the district is estimated as 37 nuts and per hectare yield as 4625 nuts. Estimated per palm yield for the district is the second lowest in the state, which is just above Chikmagalur.. Production of coconuts in Tumkur in 2012-13 is estimated to be 6608 lakh nuts, the highest in all districts due to large coconut area.

14.7 Udupi

Udupi district in the Karnataka state was created in August 1997. The three northern taluks, Udupi, Kundapur and Karkal, were separated from Dakshina Kannada District to form Udupi district. Udupi district is bordered by Uttara Kannada district in northern and Dakshina Kannada district in southern direction. Shimogga district borders on north east side and chikmagalur district on east. Arabian



sea is on west of Udupi district. Udupi is famous for Udupi cuisine originated in the district and Sri Krishna Temple. The Konkani city famous for its Sri Krishna Temple also takes its pride in coconut being one of the largest agricultural commodity sold in the Agricultural Regulated markets. Land nearer to sea is plain with small hills and paddy fields, coconut gardens etc. Land bordering western ghats in the east is covered with forests and hilly terrain. Udupi was once a thriving rice and coconut producer, but not so now. Udupi and Dakshina Kannada districts are referred to as Tulu Nadu, as they constitute the Tulu majority region.

Table 14.7

Average annual rainfall	3728 mm
Main plantation crops	Coconut, Arecanut, Cashew, Rubber
Main field crops	Paddy, Blackgram, Ground nut
Main Horticulture crops –Fruits	Mango, Banana, Jackfruit
Soil	Red laterite, Sandy loam, Alluvial
Contingencies prone to	Drought (Occasional), Flood, Sea water intrusion (Regular)

Udupi is enjoying seventh place in area under coconut cultivation in Karnataka. Nearly 4% of area under coconut and production in Karnataka is contributed by this district. Of the three Talukas three viz. Udupi, Karka and Kundapura, Udupi is the largest coconut growing Taluk contributing 42% of coconut area in the district. Average holding size as per survey findings is 0.58 Ha. Coconut palm density for the district is found to be 164 per Ha, where as the bearing palm density is 136 per Ha. Bearing palms in the sample gardens selected constitute to 83 per cent of the total palms. Based on the collected data the annual per palm yield in the district is estimated as 51 nuts and per hectare yield as 6936 nuts. Production of coconuts in Udupi in 2012-13 is estimated to be 1211 lakh nuts.

15. Findings –State

Karnataka

Karnataka state was created on 1 November 1956. Originally known as the State of Mysore, it was renamed as Karnataka in 1973. The capital and largest city is Bangalore. Karnataka is bordered by the Arabian Sea to the west, Goa to the north west, Maharashtra to the north, Andhra Pradesh to the east, Tamil Nadu to the south east, and Kerala to the south west. The state covers an area of 191,976 square kilometers, or 5.83 per cent of the total geographical area of India. It is the eighth largest Indian state by area. The highest point in Karnataka is the Mullayanagiri hill in Chikkamagaluru district which has an altitude of 1,929 metres (6,329 ft) above sea level. Karnataka is the ninth largest state by population, comprising of 30 districts, Kannada is the most widely spoken and official language of the state. The two main rivers in the state are the Krishna and Kaveri. Karnataka experiences four seasons. The winter in January and February is followed by summer between March and May, the monsoon season between June and September and the post-monsoon season from October till December. Meteorologically, Karnataka is divided into three zones — coastal, north interior and south interior. Of these, the coastal zone receives the heaviest rainfall with an Average annual rainfall of about 3,638.5 mm per annum, far in excess of the state average of 1,139 mm. Nearly 56% of the workforce in Karnataka is engaged in agriculture and related activities. A total of 12.31 million hectares of land, or 64.6% of the state's total area, is cultivated. Much of the agricultural output is dependent on the southwest monsoon as only 26.5% of the sown area is irrigated. Seven of India's leading banks, Canara Bank, Syndicate Bank, Corporation Bank, Vijaya Bank, Karnataka Bank, Vysya Bank and the State Bank of Mysore originated in this state.



The thirty districts that form part of Karnataka are

Bagalkote	Bangalore Rural	Bangalore Urban	Belgaum	Bellary
Bidar	Bijapur	Chamarajanagar	Chikkaballapur	Chikkamagaluru
Chitradurga	Dakshina Kannada	Davanagere	Dharwad	Gadag
Gulbarga	Hassan	Haveri	Kodagu	Kolar
Koppal	Mandya	Mysore	Raichur	Ramanagara
Shimoga	Tumku	Udupi	Uttara Kannada	Yadgir

As per the latest statistics available, Karnataka is the second state, next to Kerala, having largest area under coconut cultivation and coconut production in India. The state contributes about 25% of the coconut area and 27% of the production in the country. Productivity of the state is 11628 nuts/Ha., compared to national productivity of 10736 Nuts/Ha. Among thirty districts, Tumkur and Hassan are the major coconut growing districts. For the study 894 sample holdings was covered spread across seven districts and yield data from 8940 palms recorded.. Majority of the palms covered under the study was Tall, within the age group of 15-60 years. Average holding size in the state as per survey findings is 1.13 Ha, which varied from 0.51 Ha in Dakshina Kannada to 1.63 Ha. In Tumkur. Coconut palm density for the state is found to be 131 per Ha., where as the bearing palm density is 118 per Ha.. Bearing palms in the sample gardens selected constitute to almost 90 per cent of the total palms selected in the state. Yield per palm estimated varied widely from 31 to 86. The lowest of 31 is in Chikmagalur district while the highest of 86 is estimated in the district of Mandya. Based on the analysis of data collected the annual per hectare yield is 5289 nuts in the state. Production of coconuts in Karnataka state in 2012-13 is estimated to be 23451 lakh nuts, which was 44083 lakh nuts as per the latest figures released by Department of Economics & Statistics, Karnataka, The decline in production in Karnataka, as per the study was primarily because of the severe drought coupled with pest and diseases. Increase noticed in intervals between bunches and number of nuts existing in bunches relating to earlier stage seems less compared to that in later stage (Table 15.1 and Chart 1), Production in Mandya and Mysore districts is not affected to a great extend since better irrigation facilities are available in those two districts. The central team under the chairmanship of Dr. Gorakh Singh, Horticulture Commissioner, Ministry of Agriculture, visited the drought / disease affected coconut plantations in seven districts of Karnataka i.e., Tumkur, Hassan, Chikmagalur, Ramanagara, Mandya, Mysore, Chamarajanagara. Some pictures of the severely affected gardens are appended below.





Table 15.1 Average Number of Nuts in Different Age Bunches

District	>8 Months	8 Months	7 Months	6 Months	5 Months	4 Months	3 Months
Tumkur	10	6	9	14	16	17	14
Hassan	7	4	6	7	8	7	5
Chikkmagaluru	6	3	5	6	6	4	2
Mandya	24	13	12	11	10	8	8
Mysore	24	11	10	10	10	9	9
Udupi	9	7	6	6	5	4	4
Dakshina Kannada	8	7	6	6	6	5	4

Chart 1

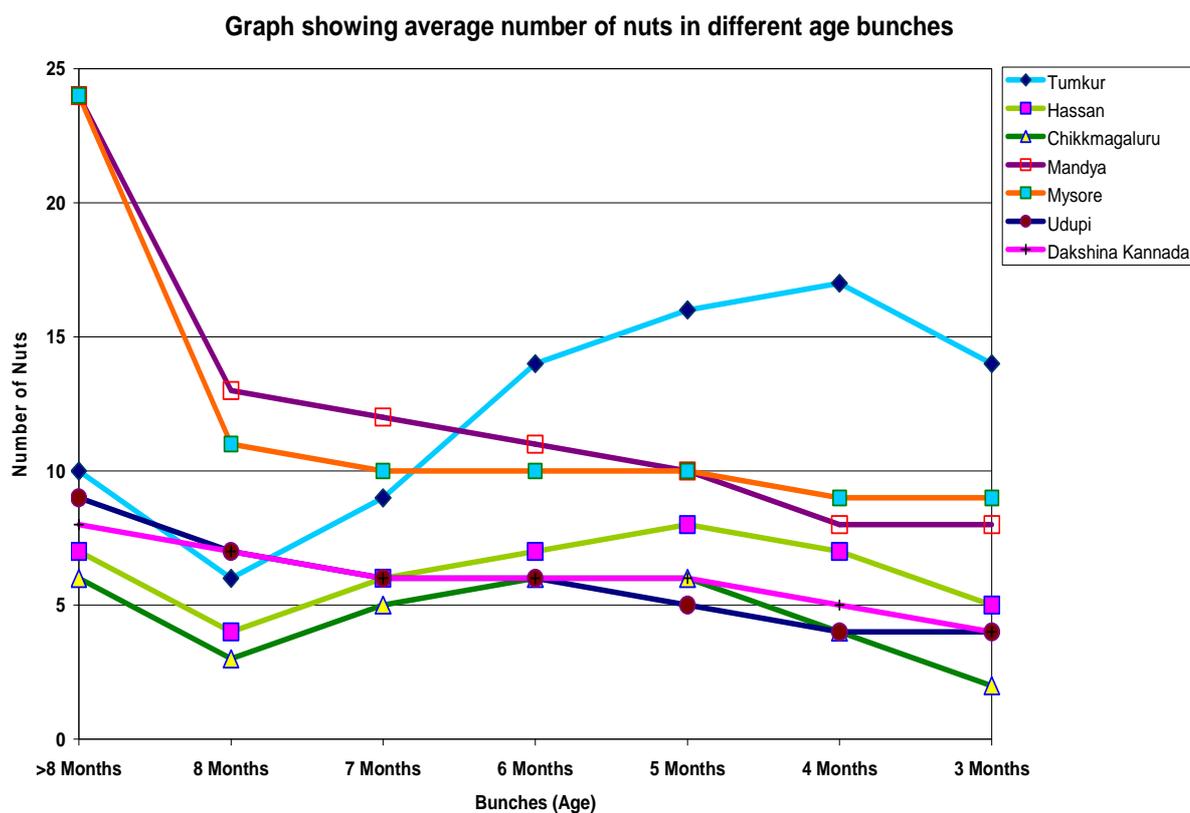


Table 15.2: Districtwise details of Holdings selected and Average holding size

Sample size details -Karnataka				
Sl.No.	Districts	Number of holdings	Total number of palms surveyed	Average holding size (Ha.)
1	Tumkur	387	3870	1.63
2	Hassan	180	1800	0.74
3	Chikkmagaluru	105	1050	1.02
4	Mandya	71	710	0.62
5	Mysore	61	610	0.75
6	Udupi	45	450	0.58
7	Dakshina Kannada	45	450	0.51
	State	894	8940	1.13

Chart 2 Average holding size

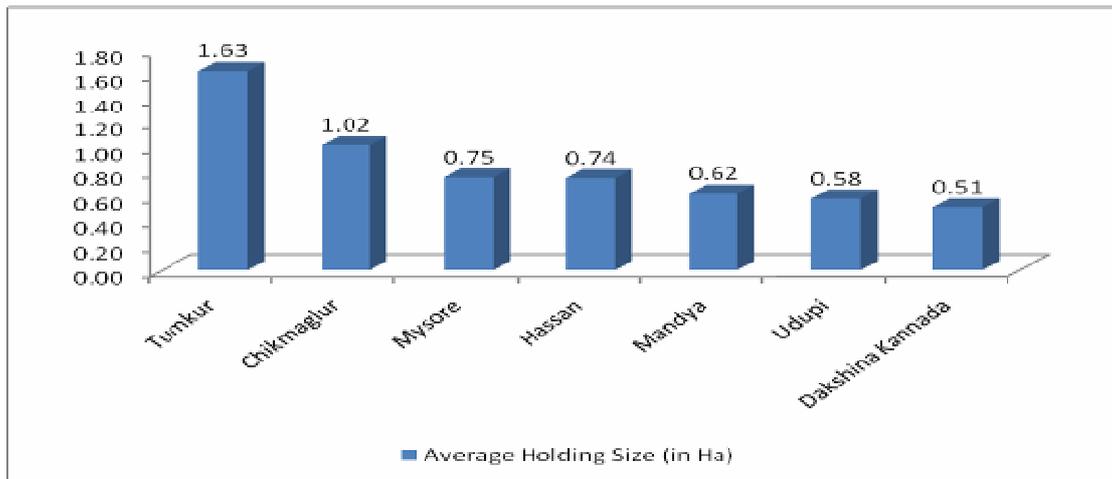


Chart 3 District wise selection of sample holdings

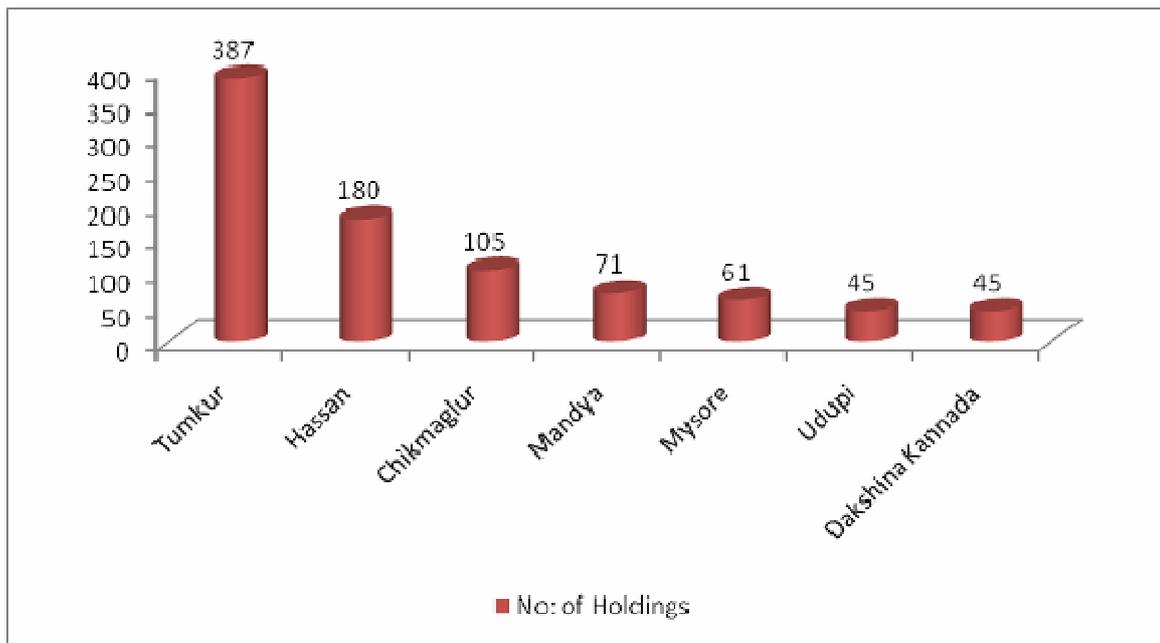


Table 15.3 Details of palms and palm density

SI.No.	Districts	Bearing palms	Non bearing palms	% of bearing palms	Palm density/Ha.	Bearing palm density/Ha.
1	Tumkur	79035	5035	94	133	125
2	Hassan	14197	4695	75	141	106
3	Chikkmagaluru	9366	2033	82	107	88
4	Manda	4710	524	90	119	107
5	Mysore	4850	411	92	115	106
6	Udupi	3585	745	83	164	136
7	Dakshina Kannada	3195	340	90	152	138
	State	118938	13783	90	131	118

Table 15.4 Yield in selected districts – Palm wise and area wise

SI.No.	Districts	Bearing palms	Yield/Palm	Yield/Ha.
1	Tumkur	79035	37	4625
2	Hassan	14197	39	4134
3	Chikmagalur	9366	31	2728
4	Mandya	4710	86	9202
5	Mysore	4850	83	8798
6	Udupi	3585	51	6936
7	Dakshina Kannada	3195	56	7728

Chart 4 Total palm density and bearing palm density in selected districts

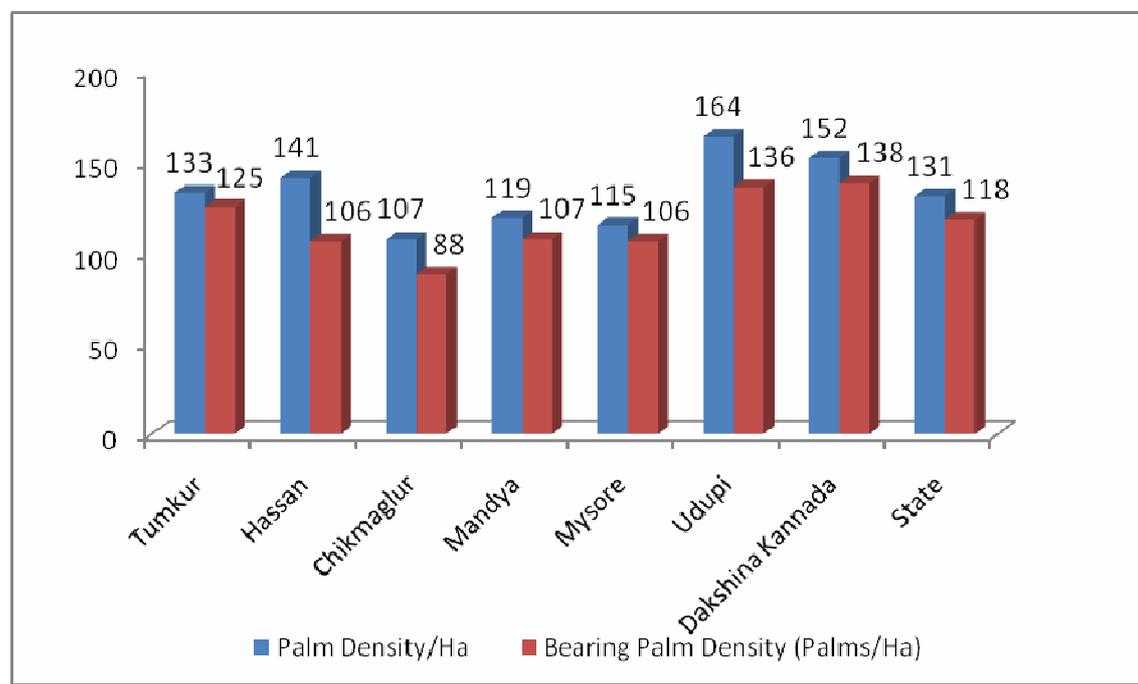
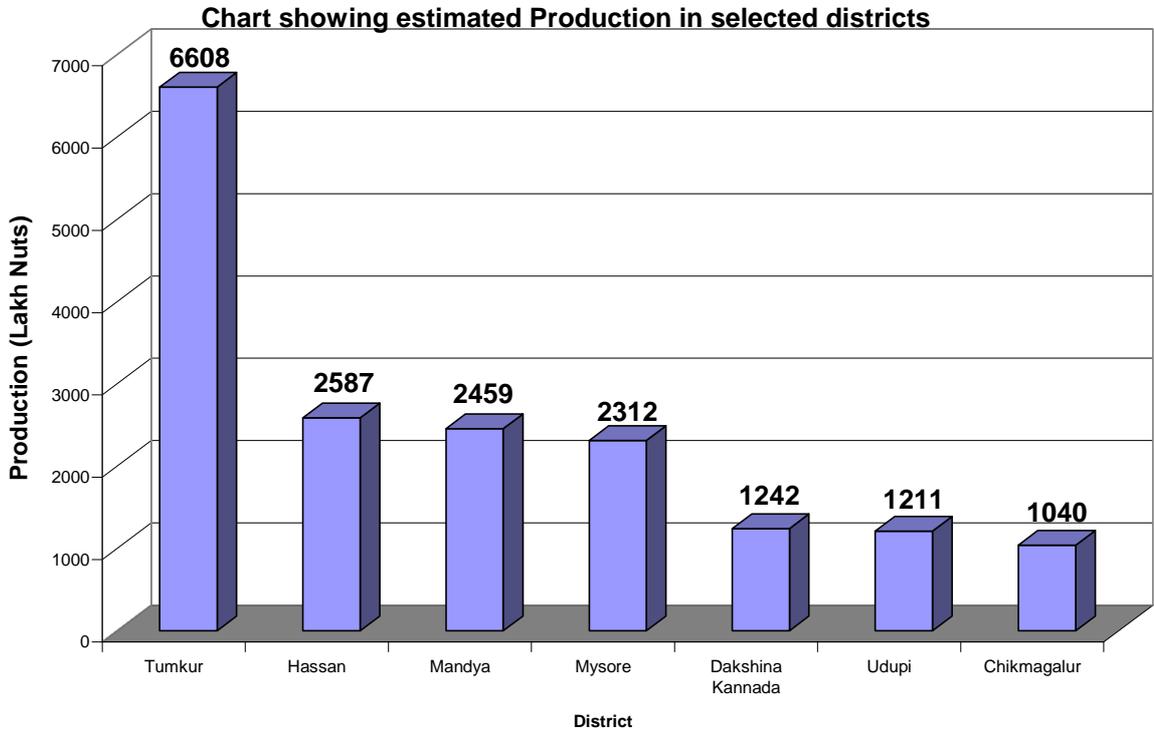


Table 15.5 Estimated production in Karnataka state in 2012-13

Sl.No.	Districts	Estimated production in lakh nuts
1	Tumkur	6608
2	Hassan	2587
3	Chikmagalur	1040
4	Mandya	2459
5	Mysore	2312
6	Udupi	1211
7	Dakshina Kannada	1242
	(Surveyed districts)	17460
	Non Surveyed Districts	5991
	State	23451

Chart 5



16. Findings at a glance

Number of Districts Selected for the Survey	7
Number of Taluks Selected for the Survey	27
Number of Panchayats Selected for the Survey	51
Total Sample Area Covered (Ha)	1010.87
Total Number of Holdings	894
Total Number of Palms from which yield recorded	8940
Average Holding Size (Ha)	1.13
Total Number of Bearing palms in sample area	118938 (90%)
Total Number of Non Bearing palms in sample area	13783 (10%)
District with highest bearing palm density	Dakshina Kannada (138)
District with lowest bearing palm density	Chikmagalur (88)
Estimated Yield /Hectare (number of nuts) 2012-13	5289
District with highest productivity (Estimate)	Mandya (9202 Nuts)
District with lowest productivity (Estimate)	Chikmagalur(2728)
District with highest production (Estimate)	Tumkur (6608)
District with lowest production (Estimate)	Chikmagalur(1040)
Estimated Production in lakh nuts for the year 2012-13	23451
Production in lakh nuts for 2011-12 (DES)	44083

Table16.1

Districtwise Area and Production of Coconut in Karnataka - 2011-12						
Sl NO:	Districts	Area in Ha	Percentage share in Area	Production in Lakh Nuts	Percentage share in Production	Productivity (Nuts/ha)
1	Tumkur	142880	32.22	13496	30.6	9446
2	Hassan	62575	14.11	6222	14.1	9943
3	Chitradurga	42531	9.59	5712	13.0	13431
4	Chikmagalur	38113	8.60	2078	4.7	5453
5	Mandya	26727	6.03	3455	7.8	12925
6	Mysore	26280	5.93	2388	5.4	9085
7	Udupi	17460	3.94	1712	3.9	9807
8	Dakshina Kannada	16077	3.63	2156	4.9	13414
9	Ramanagar	14532	3.28	1686	3.8	11599
10	Davangere	11710	2.64	1164	2.6	9943
11	Chamarajanagar	11381	2.57	892	2.0	7836
12	Uttar Kannada	7626	1.72	587	1.3	7700
13	Shimoga	5954	1.34	593	1.3	9957
14	Bangalore Rural	4039	0.91	402	0.9	9943
15	Chikkaballapur	3192	0.72	317	0.7	9943
16	Kolar	2805	0.63	279	0.6	9943
17	Bangalore Urban	2264	0.51	225	0.5	9943
18	Kodagu	1617	0.36	161	0.4	9942
19	Haveri	1290	0.29	128	0.3	9943
20	Bellari	910	0.21	90	0.2	9943
21	Bagalkote	695	0.16	69	0.2	9942
22	Koppal	652	0.15	65	0.1	9943
23	Dharwad	511	0.12	51	0.1	9943
24	Gadag	461	0.10	46	0.1	9944
25	Belgaum	307	0.07	31	0.1	9941
26	Bijapur	288	0.06	29	0.1	9941
27	Gulbarga	242	0.05	24	0.1	9942
28	Yadgir	218	0.05	22	0.0	9940
29	Raichur	27	0.01	3	0.0	9926
30	Bidar	20	0.00	2	0.0	9950
	State	443384	100.0	44083.00	100.0	9942
	Source : DES, Karnataka					

Table16.2

AREA AND PRODUCTION DATA OF COCONUT							
SI No:	STATES	2011-12					
		Area "000" ha	% Share in Area	Production "000" MT	% Share in Production	Pdn Million nuts	Yield
1	Andaman & Nicobar Islands	21.8	1.1%	72	0.5%	113	5184
2	Andhra Pradesh	142	7.0%	1270	9.1%	1985	13979
3	Assam	18.8	0.9%	101	0.7%	158	8397
4	Chhattisgarh	0.8	0.0%	6	0.0%	10	12309
5	Goa	25.7	1.3%	89	0.6%	139	5394
6	Gujarat	20.9	1.0%	218	1.6%	341	16296
7	Karnataka	506.8	24.9%	3770	26.9%	5893	11627
8	Kerala	766	37.6%	3974	28.4%	6211	8109
9	Lakshadweep	2.7	0.1%	40	0.3%	63	23156
10	Maharashtra	21	1.0%	120	0.9%	188	8931
11	Nagaland	0.9	0.0%	0	0.0%	0	521
12	Orissa	53.9	2.6%	258	1.8%	403	7482
13	Puducherry	2.1	0.1%	20	0.1%	31	14886
14	Tamil Nadu	420.7	20.6%	3692	26.4%	5771	13717
15	Tripura	5.9	0.3%	9	0.1%	13	2278
16	West Bengal	29.1	1.4%	368	2.6%	574	19739
	Total	2039.1	100%	14007	100%	21892	10736

17. GENERAL OBSERVATIONS:

- Estimation of 2012-13 production for the district has been made by considering published cropped area of 2009-10 DES, Govt of Kanataka.
- Only high sharing blocks as far as cropped area have been considered, which may lead to over estimation of the production
- Decline in the production has been noticed due to severe drought in the state during current, as well as, previous years and same is better wherever good irrigation facilities are available..
- Decline in the production may also be due to replacement of the crop by arecanut as it is catching up in the state because of high rate to the arecanut produce
- Farmers have neglected coconut crop, as they are getting very low rate for their produce because of involvement of the middlemen.
- Rodent/squirrel problem also causes reduction in production

18. References

- Draft Survey report and data for Tumkur district by Dr.Mallikarjuna, UAS, Bangalore
- Draft Survey report and data for Mysore and Mandya districts by Dr.Dinesh, UAS, Bangalore
- Draft Survey report and data for Hassan and Chikmagalur districts by Dr.G.M.Gaddi, UAS, Bangalore
- Draft Survey report and data for Udupi and Dakshina Kannada districts by Dr.Hari Kurup, Govt. College, Kasaragod
- District Wikipedia (all districts and state of Karnataka)
- Dept. of Agri. & Cooperation website
- Department of Economics & Statistics –Coconut Statistics 2009-10
- Report on the visit of central team in Karnataka to assess the impact of drought, pest and diseases