

2012-13

COCONUT
DEVELOPMENT
BOARD

CONCURRENT ESTIMATION OF COCONUT PRODUCTION IN ANDHRA PRADESH



Statistics Section

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1 Introduction

1.1 Background

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 17,000 million nuts, coconut contribution to nation's GDP is about 15,000 crores rupees.

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, Tamil Nadu Karnataka and Andhra Pradesh for the agriculture year 2012-13.

1.2 Objective

- To estimate concurrent production and yield of coconut in four major southern states including Andhra Pradesh for 2012-13.
- To develop a scientific model for predicting the coconut production in the country 6-10 months in advance.

1.3 Coverage

Of the 23 districts in Andhra Pradesh, coconut cultivation is mainly there only in 10 districts, of which based on the area under coconut cultivation, major 3 districts were selected. The districts selected, and sample area covered is given in the table below:

Table 1.3

SI No	Districts	Area under Coconut cultivation(Ha)	Sample Area (Ha)	Percentage of area covered
1	West Godavari	20551	167.84	0.82
2	East Godavari	50741	479.26	0.94
3	Srikakulam	14636	174.82	1.19
	Total	85928	821.92	0.96

Source: DES Andhra Pradesh 2011-12data, survey data - sample area

1.4 Sampling Design

Multistage sampling method is used for the selection of holdings/gardens for collecting the primary data. District is selected based on area under coconut cultivation. Minimum area cut off for selecting a district in the state was 14000 ha. Villages were selected based on statistical sampling technique; from each village, 10 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.

1.5 Sample Size

Total area under coconut cultivation in the 3 districts is about 85928 ha according to DES Andhra Pradesh 2011-12 results. Out of which the sample area covered under the survey is **821.92 ha**. In total, 5130 palms were surveyed and average holding size in the district is **1.60 ha** according to the survey.

Sample size details : Andhra Pradesh				
SI No	Districts	Number of holdings	Total number of palms surveyed	Average holding size(in ha)
1	West Godavari	123	1230	1.36
2	East Godavari	305	3050	1.57
3	Srikakulam	85	850	2.06
	Andhra Pradesh	513	5130	1.60

Table 1.5: Districtwise details of Holdings selected and Average holding size

Chart 1- District wise Average size of holdings

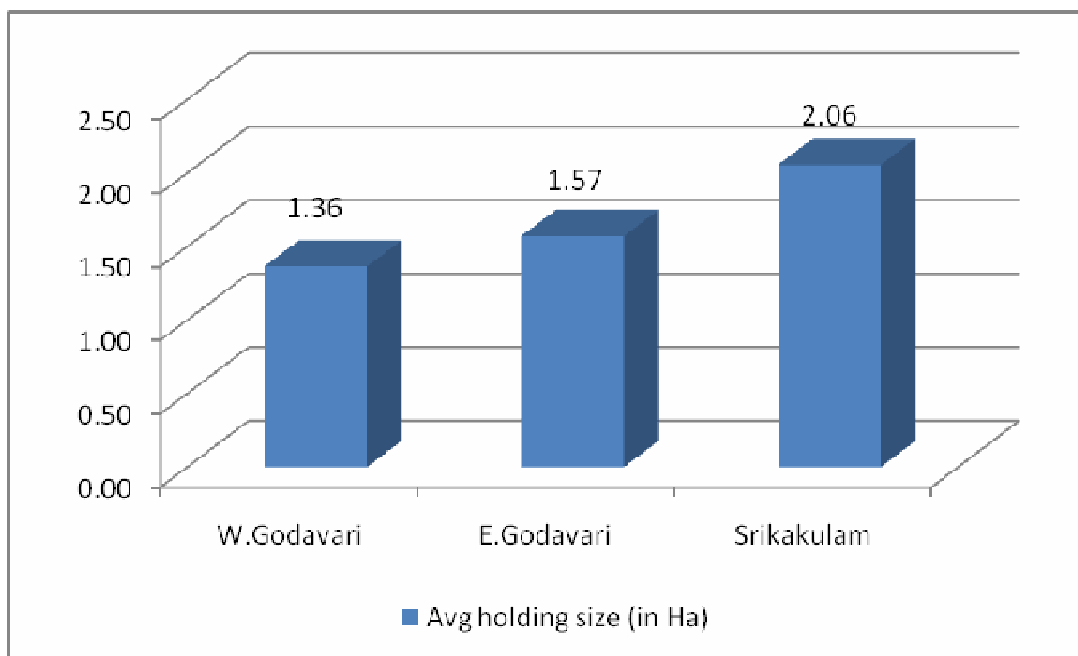
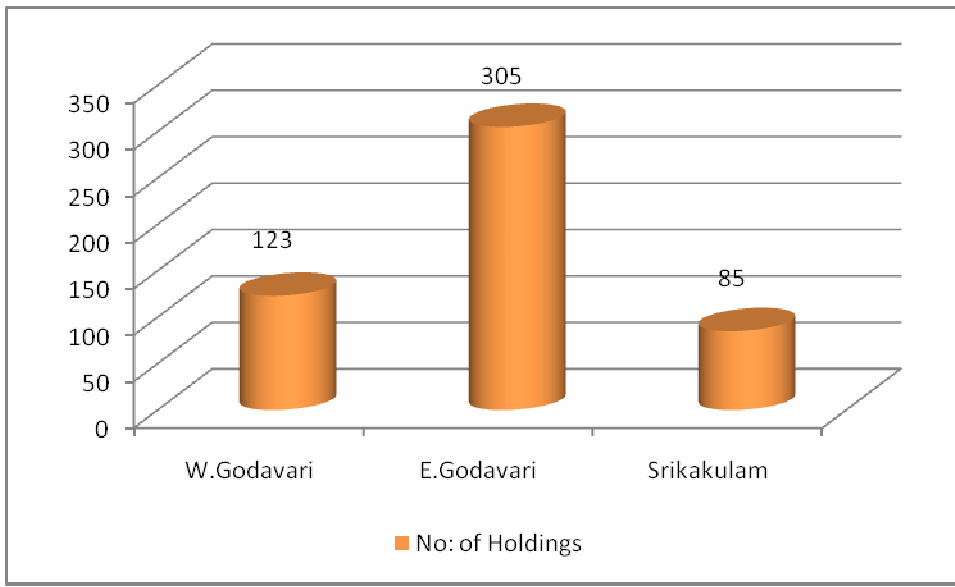
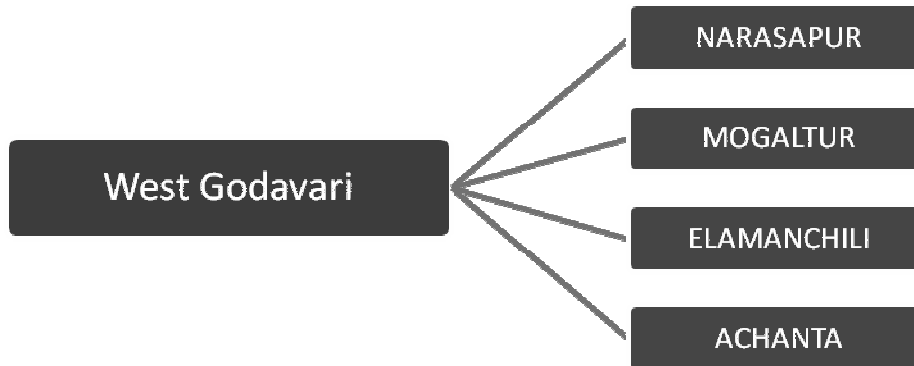


Chart 2 – District wise distribution of holdings selected for the survey



1. West Godavari

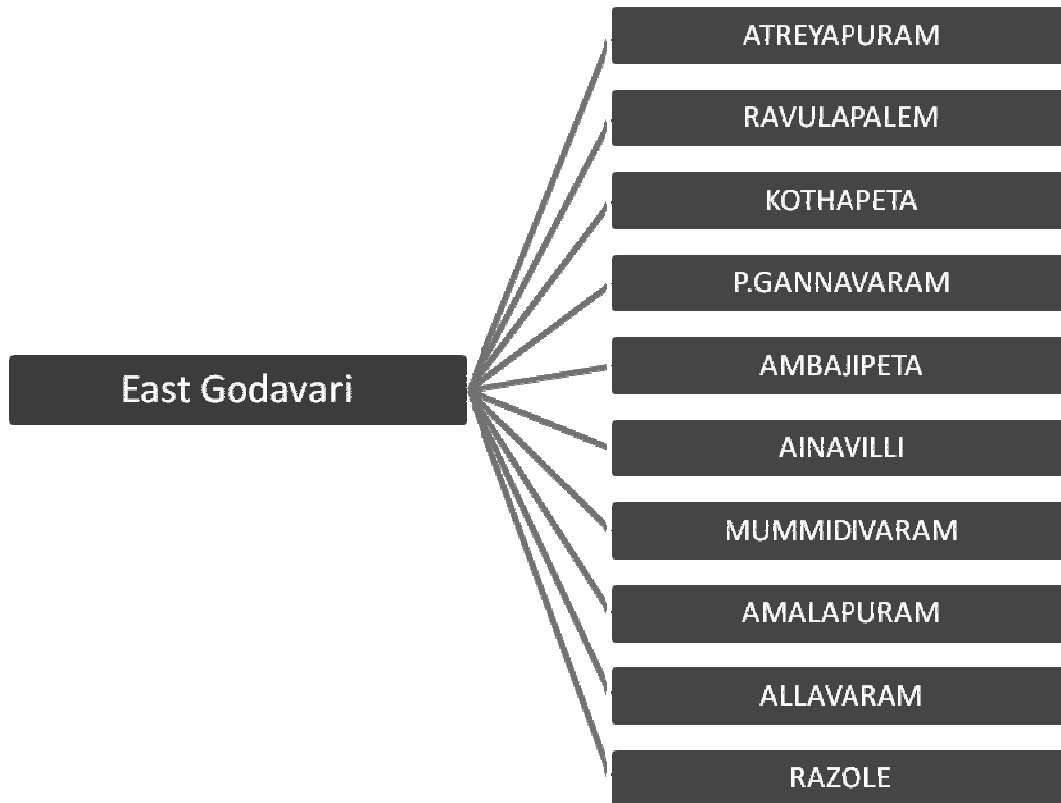
West Godavari which lies in the delta region of Krishna and Godavari rivers consisting of 46 mandals constitutes for 20% (20551 ha) of total area (103967 ha) under coconut cultivation in the state. 4 mandals were selected for the survey purpose based on the area under coconut cultivation.



SI No:	Mandals	No: of Holdings	No: of Palms Surveyed	Sample area (in ha)	Avg holding size (in Ha)
1	Narasapur	30	300	51.71	1.72
2	Mogaltur	20	200	37.87	1.89
3	Elamanchili	43	430	54.15	1.26
4	Achanta	30	300	24.11	0.80
	Total	123	1230	167.84	1.36

2. East Godavari

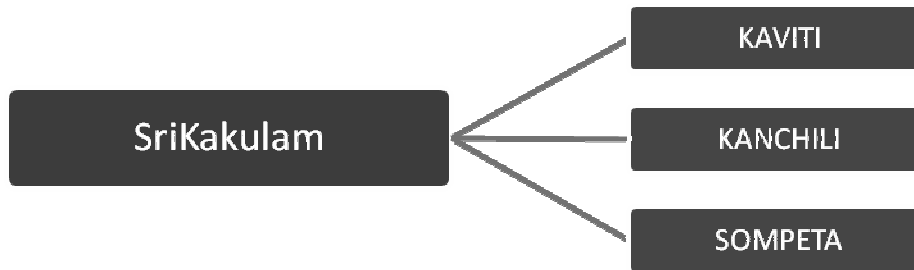
East Godavari also known as another kerala for its lush green paddy fields and coconut groves constitutes 49% (50741 ha) of total area under coconut cultivation(103967 ha) in the state. It occupying the largest part of the rich Godavari delta comprises of 60 mandals , from which 10 were selected for the purpose of conducting the survey.



SI No:	Mandals	No: of Holdings	No: of Palms Surveyed	Sample area (in ha)	Avg holding size (in Ha)
1	Atreyapuram	20	200	36.42	1.82
2	Ravulapalem	21	210	23.27	1.11
3	Kothapeta	33	330	41.68	1.26
4	P.Gannavaram	35	350	44.24	1.26
5	Ambajipeta	41	410	76.49	1.87
6	Ainavilli	30	300	48.04	1.60
7	Mummidivaram	30	300	40.59	1.35
8	Amalapuram	40	400	70.21	1.76
9	Allavaram	29	290	54.51	1.88
10	Razole	26	260	43.81	1.69
	Total	305	3050	479.26	1.57

3. Srikakulam

Area under coconut cultivation in Srikakulam constitutes to 14% (14636Ha) of total area (103967ha) under coconut cultivation in the state. Out of the 38 mandals in Srikakulam, 3 mandals were selected based on the area under coconut cultivation for the survey purpose.



SI No:	Mandals	No: of Holdings	No: of Palms Surveyed	Sample area (in ha)	Avg holding size (in Ha)
1	Kaviti	30	300	69.4	2.31
2	Kanchili	30	300	57.87	1.93
3	Sompeta	25	250	47.55	1.90
	Total	85	850	174.82	2.06

1.6 Period of Survey

The survey started in Andhra Pradesh during the month of February.

2 Methodology

For the estimation survey of coconut production in Andhra Pradesh, 3 major districts were selected based on the extent of area under coconut cultivation. From each identified districts, selection of blocks were made on the basis of statistical sampling techniques. From each block, selection of Grama panchayat was done on the basis of accepted scientific sampling norms for selecting the holdings. From each panchayat, 10 holdings having minimum 40 bearing palms is selected randomly for collection of data. From these, 10 palms are selected at random. From the selected palms, all bunches carrying developing nuts after fertilization i.e. three months and above will be identified and serially numbered and number of nuts in each bunch is recorded.

Properly structured formats were used by field investigators for collection of primary data. Part A meant for geographical information of the holdings surveyed, part B the details of coconut farmer, part C information about coconut holdings and part D meant for specific yield details of the selected palms.

3 Survey Results & Analysis

3.1 Concept and Definitions

The main purpose of analysis of data is to arrive at estimate of yield and production per palm and per hectare basis which is required for estimating production with a reasonable degree of accuracy. Estimate of production can be obtained according to different concepts used which are

1. **Yielding palms:** Coconut palms which have attained fruit bearing stage at the time of enumeration are classified as yielding palms.
2. **Non- Yielding palms :** Coconut palms which have not attained nut bearing stage at the time of enumeration and coconut palms which have reached bearing stage but not bearing due to reasons like sterility, disease, old age etc. are classified as non- bearing palms
3. **Yield:** A measurement of output obtained or harvested per tree or a unit of land area.
4. **Plant Density:** The number of plants standing within a given unit of area (here the unit area taken is Ha).
5. **Yielding Plant Density:** The number of Yielding plants within a given unit of area (here the unit area is taken Ha).

3.2 Formulae

- 1)
$$\text{Average yield per palm} = \frac{\text{Total number of coconut nuts obtained in a year (Count)}}{\text{Total number of yielding coconut palms (Count)}}$$
- 2)
$$\text{Average plant density} = \frac{\text{Total number of coconut palms (Count)}}{\text{Coconut cultivated area (Ha)}}$$
- 3)
$$\text{Area yielding palm density} = \frac{\text{Total number of yielding coconut palms (Count)}}{\text{Yielding coconut area (Ha)}}$$
- 4)
$$\text{Average holding size} = \frac{\text{Total coconut cultivated area (Ha) covered in the sampling area}}{\text{Total No of holdings (Count) in the sampling area}}$$
- 5)
$$\text{Average yield /ha} = \text{Average per palm yield} \times \text{yielding palm density /ha}$$

3.3 Distribution of Holding Size

The total area surveyed in the state is 821.92 ha. The number of holdings surveyed in the state is 513 spread across 17 mandals and yield observed was of 5130 palms.

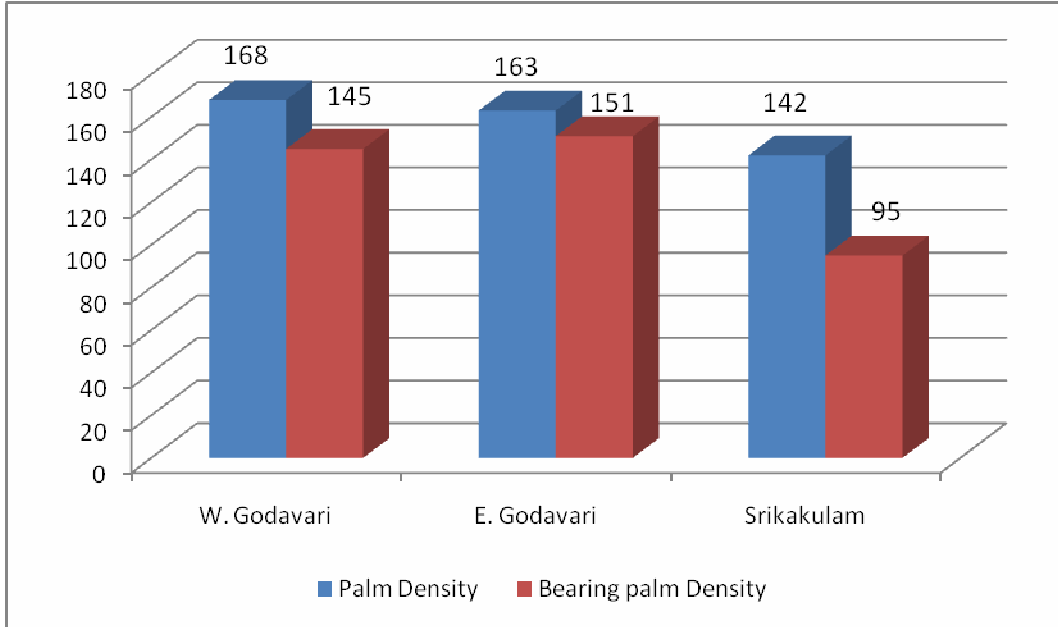
3.4 Plant Density, of Bearing & Non Bearing Palms

The most important management tool in achieving optimal overall productivity is coconut spacing that is expressed as the planting density per unit area. 175 palms per ha is considered as the optimum palm density. The survey revealed that the plant density in the state varies from 142 palms/Ha , the lowest at Srikakulam to 168 palms /Ha in W.Godavari . Density of yielding palms varies from 95 to 151 palms . Table 3.2 shows the details of palm density for the surveyed districts.

Table 3.4

Sl No	Districts	Palm Density/Ha	Bearing Palm Density (Palms/Ha)	Bearing Palms	Non bearing Palms	% of Bearing Palms
1	W.Godavari	168	145	24331	3826	86%
2	E.Godavari	163	151	72604	5702	93%
3	Srikakulam	142	95	16590	8235	67%
	State	160	138	113525	17763	86%

Chart 3



3.5 Yield – Palm wise and per Hectare

The table shows the per palm yield and per hectare yield obtained from the survey.

Table 3.5.1

Sl No	Districts	Bearing Palms	Yield /Palm	Yield / Ha
1	W.Godavari	24331	30	4350
2	E.Godavari	72604	37	5587
3	Srikakulam	16590	17	1615

Chart 4 Yield / Ha for the surveyed districts

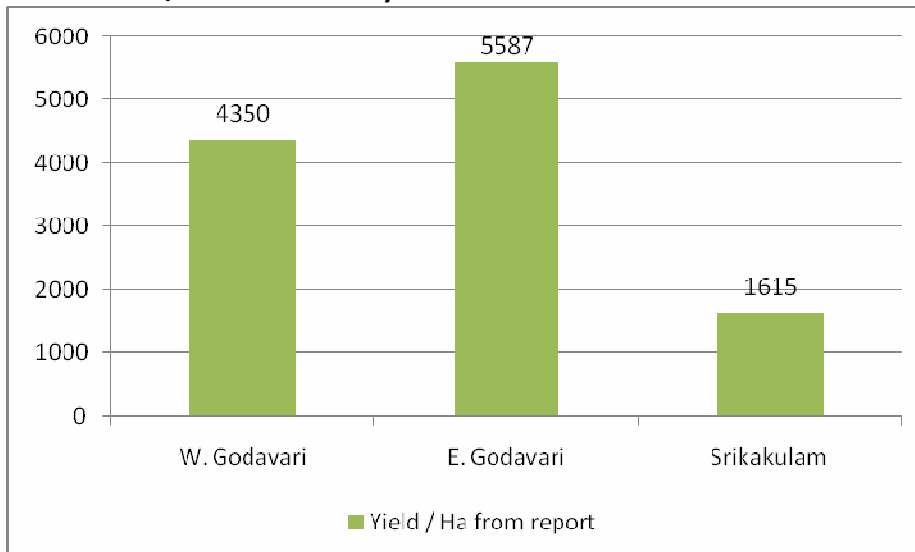
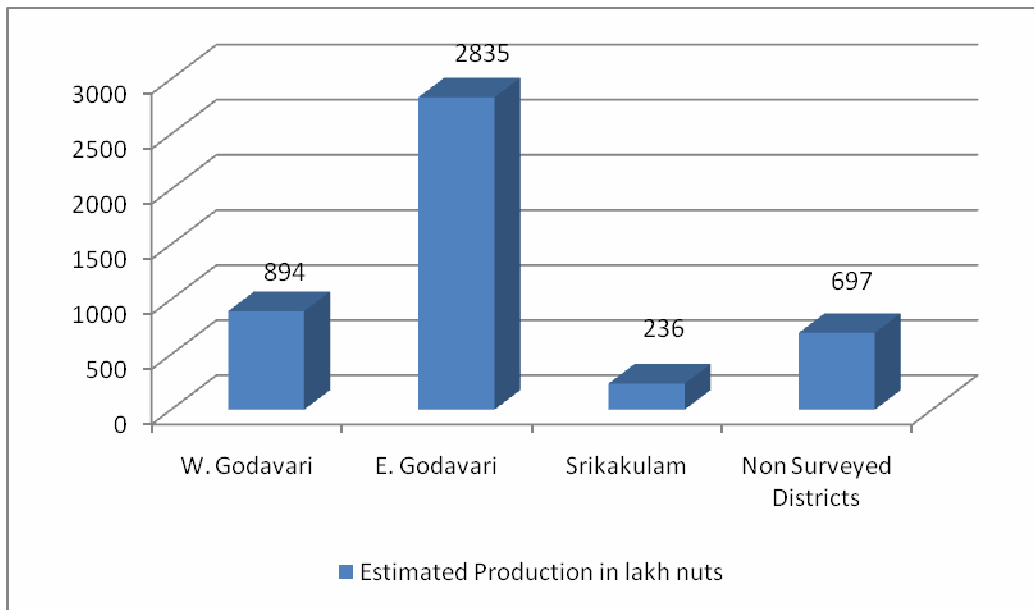


Table 3.5.2

Districts	Estimated Pdn in Lakh nuts (2012-13)
W.Godavari	894
E.Godavari	2835
Srikakulam	236
Surveyed Districts	3965
Non Surveyed Districts	832
STATE	4798

Chart 5 Estimated Coconut Production in lakh nuts for the year 2012-13



4 Findings at a Glance

- *The survey estimates per palm yield for the Andhra Pradesh state is at 28 nuts for 2012-13*
- *The average yield per hectare is estimated at 4615 nuts for 2012-13*
- *Total coconut production is estimated for the state at 4798 lakh nuts for 2012-13*
- *Coconut production has decreased in Andhra Pradesh (2012-13) over the previous year by 66% .*

Findings At A Glance	
Number of Districts Selected for the Survey	3
Number of Mandals Selected for the Survey	17
Total Sample Area Covered	821.92 Ha
Total Number of Holdings	513
Average Holding Size	1.60 Ha
Total Number of Palms Surveyed	5130
Yield /Palm	28 nuts
Yield /Hectare -2012-13	4615 nuts
Estimated Production for the year 2012-13	4798 lakh nuts

5 Data Tables

Table 5.1

Districtwise Area and Production of Coconut in Andhra Pradesh - 2011-12				
SI No:	Districts	Area in Ha	Production in Lakh Nuts	Productivity (Nuts/ha)
1	East Godavari	50741	7199.61	14189
2	West Godavari	20551	3434.23	16711
3	Srikakulam	14636	1696.97	11594
4	Visakapatnam	7054	722.95	10249
5	Chittoor	3663	293.77	8020
6	Vizianagaram	2689	376.57	14004
7	Krishna	1965	275.13	14002
8	Anantapur	895	71.65	8006
9	Nellore	769	107.7	14005
10	Khamam	675	92.6	13719
11	Cuddapah	132	10.56	8000
12	Guntur	125	17.58	14064
13	Prakasam	47	6.55	13936
14	Kurnool	15	1.19	7933
15	Mahabubnagar	4	0.58	14500
16	Nalgonda	3	0.44	14667
17	Nizamabad	2	0.29	14500
18	Ranga Reddy	1	0.15	15000
19	Adilabad	0	0	0
20	Hyderabad	0	0	0
21	Karimnagar	0	0	0
22	Medak	0	0	0
23	Warangal	0	0	0
	State	103967	14308.52	13763

Source : DES, Andhra Pradesh

**Table
5.2**

AREA AND PRODUCTION DATA OF COCONUT							
SI No:	STATES	2010-11 (Final)					
		Area "000" ha	% Share in Area	Productio n "000" MT	% Share in Productio n	Pdn Million nuts	Yield
1	Andaman & Nicobar Islands	21.7	1.1%	65.4	0.6%	102	4711
2	Andhra Pradesh	104	5.5%	667	6.2%	1043	10024
3	Assam	18.8	1.0%	101	0.9%	158	8397
4	Chhattisgarh	0.7	0.0%	6.3	0.1%	10	14067
5	Goa	25.6	1.4%	88	0.8%	138	5373
6	Gujarat	16	0.8%	108	1.0%	169	10550
8	Karnataka	419	22.1%	1497	13.8%	2340	5584
9	Kerala	788	41.6%	3992	36.8%	6239	7918
10	Lakshadweep	2.7	0.1%	40	0.4%	63	23156
11	Maharashtra	21	1.1%	120	1.1%	188	8931
12	Nagaland	0.9	0.0%	0.3	0.0%	0	521
13	Orissa	51	2.7%	190	1.8%	297	5823
14	Puducherry	2.1	0.1%	20	0.2%	31	14886
15	Tamil Nadu	390	20.6%	3692	34.1%	5771	14796
16	Tripura	5.8	0.3%	8	0.1%	13	2156
17	West Bengal	28.6	1.5%	245	2.3%	383	13389
	Total	1895.9	100%	10840	100%	16943	8937

Source : Source : Advisor, Horticulture Division, Ministry of Agriculture, Government of India

6 References

1. Survey report for W. Godavari district by Dr. S.Teki
2. Survey report for E.Godavari district by Dr. S.Teki
3. Survey report for Srikakulam district by Dr. S. Teki
4. Data entry done on Coconut Development Board website

List of Institutions/Colleges			
Sl.No	District	College/Institute	Survey Coordinators
1	W.Godavari	Adikavi Nannaya University	Dr.S. Teki
2	E.Godavari	Adikavi Nannaya University	Dr.S. Teki
3	Srikakulam	Adikavi Nannaya University	Dr.S. Teki