

A Study on Problems and Prospects of Coconut Growers in Pollachi Taluk, India

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Abstract

The coconut is a benevolent tree, a nature's gift to mankind as it is a source of food, beverage, oil-seed, and fiber, timber and health products and also associated with religious rituals in the life of people. India has recently achieved the distinction of being the highest producer of coconuts in the world, having overtaken the next highest producer the Philippines with the production of 15,729.75 million nuts in the year 2008-09. Pollachi is the highest coconut producing taluk in Tamil Nadu. The Research study was undertaken to analyze the performance, problems and prospects of coconut growers in the taluk. The objective of this study is to know the demographic profile, performance and problems in the areas of cultivation, maintenance and marketing of coconut and also to elicit the prospects. By applying various statistical tools, factors involved in performance and problems were analyzed and their significant relationships were carefully studied. It was propounded through this research that the government should intervene to increase production and marketing of coconut by providing subsidies, training to coconut growers, technological up-gradation, loan facilities, storage facilities and control of unit price etc. So, the above suggestions can be generalized to other parts of the country to reap maximum production and systematic marketing of coconut which will surely benefit to coconut growers and also to India's economy.

Key words: Coconut palm, Kernel, Coir pith, Irrigation, Cultivation

Introduction

The coconut palm is a versatile plant with a variety of uses. Every part of it is useful to mankind in one form or the other; it supplies food, drink and shelter and also raw materials for a number of industries. Coconut is frequently used in various ceremonies like wedding, dedication of buildings and sacrificial occasions. Matured dehusked nut possesses three distinct raw materials i.e. wet meat or kernel, water and shell.

The origin of coconut as the subject of controversy, with most authorities claiming it is native to South Asia, while others claim its origin is in North Western America. The fossils have been uncovered in Kerala and Rajasthan. Thennai in Tamil Nadu at banks of river Palar, Thenpennai, Thamirabarani and Cauvery. The coconut tree thrives on sandy soils and is highly tolerant of salinity; it prefers area with abundant sunlight and rainfall (150 cm to 250 cm annually). Coconuts also need high humidity (70 – 80 percent) for optimum growth. India has recently achieved the distinction of being the highest producer of coconuts in the world, having overtaken the next highest producer the Philippine islands. However the average coconut produced per palm in this country is dismal, standing it about 46 nuts per palm per year in 2006 – 2007 compared to 30 nuts per palm 1950 – 51. Kerala is the largest coconut growing state in India seconded by Tamil Nadu. Pollachi Taluk is the largest coconut producing taluk in Tamil Nadu. And also it is famous for coconut based products like tender coconut, water, copra, coconut oil, coconut cake, coconut candy, coconut shell fashion products, coconut leaves and coir pith.

Table - 1

State wise Production of Coconut in India

(All India Final Estimates of area and production of Coconut)

Source: Directorate of Economics & Statistics, Ministry of Agriculture, Govt. of India.

States/Union Territories	2007-2008 (Revised)			2008-2009 (Final)		
	AREA ('000 Hectares)	Production (Million nuts)	Productivity (Nuts/ha)	AREA ('000 Hectares)	Production (Million nuts)	Productivity (Nuts/ha)
Andhra Pradesh	101.32	1119.26	11047	104.00	970.00	9327
Assam	19.00	136.00	7158	18.80	147.10	7824
Goa	25.50	127.60	5004	25.61	128.18	5005
Gujarat	16.40	138.30	8433	15.98	157.42	9851
Karnataka	405.00	1635.00	4037	419.00	2176.00	5193
Kerala	818.80	5641.00	6889	787.77	5802.00	7365
Maharashtra	21.00	175.10	8338	21.00	175.10	8338
Nagaland	0.90	0.20	222	0.92	0.55	598
Orissa	51.00	275.80	5408	51.00	275.80	5408
Tamil Nadu	383.37	4968.20	12959	389.60	5365.00	13771
Tripura	5.80	11.40	1966	5.80	11.40	1966
West Bengal	28.60	355.50	12430	28.60	355.50	12430
A & N Islands	21.60	80.60	3731	21.69	82.00	3781
Lakshadweep	2.70	53.00	19630	2.70	53.00	19630
Pondicherry	2.20	26.60	12091	2.10	30.70	14619
All India Total	1903.19	14743.56	7747	1894.57	15729.75	8303

At present, the scenario has been greatly improved. Today agriculture sector have been modernized to a great extent, which leads to manifold productions, the role of marketing trends of agricultural products are fast changing. Even then, certain agriculturalists are facing many hardships in cultivating, producing and marketing their products.

Statement of the problem:

The proposed study is an attempt to investigate into performance of coconut growers in the process of cultivation, production and marketing of their produce. The following are the important problems the coconut growers are usually facing:

- ❖ Pricing is not decided by the coconut growers but by buyers or middlemen.
- ❖ Introduction of regulated markets and passing of various enhancements relating to agricultural products including coconut have given only regional benefit to coconut growers.
- ❖ Since, coconut is a highly perishable commodity; there is a high demand for transportation and storage facility in order to protect the produce from deterioration of quality.
- ❖ Financial problems faced by coconut growers because of crop failure or low production due to diseases and climatic conditions.

So this study will be conducted to provide suggestions for better performance and finding out solutions to above problems. And also to study about various factors towards the prospects of coconut growers such as: incentives, subsidies from the government, strengthening of research and development, technological up-gradation, hassle free rules and regulations to bank loan accessibility, training to coconut growers, insurance, access to modern equipments, tapping of export potential, access to easy market information, providing input materials at subsidized rates by the government and forming coconut cartel to reap the common benefits.

Objectives of the study:

The following are the objectives of this research study which have been framed and analysed systematically by using various statistical tools:

1. To know the profile of the study area.
2. To analyze the cost of cultivation, production and marketing of coconut growers and return on the investment and to provide suitable suggestions for better performance.
3. To offer suitable solutions to overcome the problems faced by coconut growers in the process of cultivation, production and marketing.

Collection of Primary data:

A structure of the question was prepared to scrutinize the problems, and prospects of coconut growers. The interview schedule was prepared in the regional language of the farmers of coconut. The interview schedules of the farmers were categorized into 4 different parts. Part I elucidates 5 questions about the profile of the farmers, Part II shows 4 conceptual questions with regard to the problems faced by farmers of coconut during the process of cultivation, production and marketing. In part III the researcher rose 11 different questions relating to prospects towards the betterment of coconut growers. The conceptual questions rose to measure the problems on cultivation, production and marketing of coconut were categorical type and questions on problems were anchored in 5 point scale and it is uniformly followed by the questions raised to the coconut growers.

Collection Secondary data:

The researcher relied more on primary data than on secondary data. However, to collect certain concrete information and to know the general details relating to marketing system and practices of coconut in Pollachi taluk, Agricultural Department Officials, Commissioner of statistics, Tamil Nadu and District Collectorate were consulted. Information of general nature were obtained from Indian

Coconut Journals, Books on agricultural marketing, reports from Coconut Development Board, Kochi and Coconut Research Centre, Azhiyar and websites relating to coconut.

Analysis of data:

After the final data collection is over, the researcher organised the collected data from coconut growers and the responses from Interview Schedule was quantified by various scales. The information collected was computed by preparing Master Chart which will be helpful in preparing smaller cross tables to show distribution in terms of dependent and independent variables. This analysis was done to identify the significant relationship on various functions relating to cultivation, production and marketing performance. Finally, various statistical tools, such as factor analysis by principal component method, one-sample 't' test, Friedman's test, discriminant analysis, and One-way Analysis of Variance were used to analyse the performance of coconut growers in Pollachi Taluk of Coimbatore district.

Limitations of the Study:

The researcher has concentrate to execute this study on the response of the coconut growers in the villages of Pollachi Taluk. Even though majority of the respondents are literate enough up to SSLC, they are not willing to provide complete information relating to their coconut fields. In many villages, people are providing information only after consent of Panchayat President, Karnam or Jamin (informal leader) of their villages. Coconut growers are too hesitant to furnish information because of the political interference and prevailing disciplines in those villages. Most of the coconut growers are not maintaining proper records and documentary evidences relating to their coconut field. Some coconut growers are not able to recall and furnish the information with fair degree. All those who maintain the records are refused to reveal and few of them refused to co-operate.

Problems and Prospects of Coconut Growers towards their coconut field – an Analysis;

Factors Contributing to Problems in cultivation and maintenance

This study explored the contributory factors with respect to problems of cultivation and maintenance among the growers of coconut growers. Factor analysis by principal component method is applied to identify the contributory factors that led to the problems of cultivation and maintenance among the coconut growers.

Table - 2

KMO and Bartlett's Test for Problems in cultivation and maintenance

Kaiser-Meyer-Olkin of Sampling Adequacy.	Measure	0.560	
Bartlett's Test of Sphericity		Approx. Chi-Square	86.23
		df	9
		Sig.	.000

The KMO and Bartlett's test for sampling adequacy for seven variables are found to be 0.560 and the chi-square value of Bartlett's test for sphericity is 86.23. This clearly indicated that all the seven variables are different and perfectly distributed in a normal distribution. This also emphasized that the factor analysis is suitable for seven variables of problems faced by the coconut growers in cultivation and maintenance (**Table-2**). The variance explained by the seven variables is presented below:

Table - 3

Factors contributing to problems in cultivation and maintenance

Components	Initial Eigen values			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Power interruption	1.53	21.94	21.94	1.46	21.94	21.94
Frequent attack of pests and diseases	1.30	18.59	40.54	1.20	18.59	40.54
Monsoon failure	1.02	14.57	55.11	1.19	14.57	55.11
High cost of fertilizers and boosting chemicals	.94	13.50	68.61	1.07	13.50	68.61
Non-availability of quality fertilizers and boosting chemicals	.89	12.80	81.42			
Depletion in ground water level	.794	11.34	92.77			
Non-availability of quality seedlings	.506	7.23	100.00			

Extraction Method: Principal Component Analysis:

The above table explained that factor analysis by principal component method with varimax rotation has revealed four eigen values such as 1.46, 1.20, 1.19, and 1.07. This indicated that the eigen values greater than 1 led to the existence of four major factors with 68.61 percent of variance (Table-3). These factors are subjected to continuous varimax rotation with respect to the correlation values and component-wise segregation which is given below:

Table - 4

Variables Loadings on Factors influencing in cultivation and maintenance

Variables / factors	Variable Loadings
Non-Availability of seedlings and Manure	
Non-availability of quality seedlings	.799
Non-availability of quality fertilizers and boosting chemicals	.764
High cost of fertilizers and boosting chemicals	.773
Natural Disorders	
Monsoon failure	.592
Frequent attack of pests and diseases	.408
Depletion in ground water level	.905
Erratic Power Supply	
Power interruption	.445

Rotation Method: Varimax with Kaiser Normalization:

Rotation converged in 9 iterations. The rotated component matrix in the above table explained the variables loadings in each predominant factor influencing to problems of cultivation and maintenance. It is observed that the first factor consisted of three variables and named as ‘**Non-availability of seedlings and manure**’. The second factor consisted of three variables and it is known as **Natural Disorders**. The third factor consisted of one variable which are called as **Erratic power supply**. It is also observed from the above table the coconut growers’ are affected by ‘Non-availability of seedlings and manure, Natural Disorders and Erratic power supply.

Influence of Problems on Profile of Coconut Fields:

The eleven predominant problems, as revealed by factor analysis on profile of coconut field have been analysed to measure their influence. The said problems have been taken as dependent variables and

profile of coconut field, such as Years of experience in coconut cultivation, Possession of land, Area of coconut cultivation, Variety of coconut palm cultivated, Age of coconut trees, Type of irrigation and Total annual yield of coconut nuts as independent variables. One-way Analysis of Variance (ANOVA) is applied to find out the influence of

Influence of Problems in Cultivation and Maintenance on Profile of Coconut Field:

The following ANOVA tables clearly illustrate the influence of problems in cultivation and maintenance, such as non-availability of seedlings and manure, natural disorders and erratic power supply on profile of coconut field.

Table – 5
Influence of Problems in Cultivation and Maintenance on
Years of Experience in Coconut Cultivation

The ANOVA table revealed that there is a significant difference exist among the years of

Problems in Cultivation and Maintenance		Sum of Squares	df	Mean Square	F	Sig.
Non-Availability of seedlings and Manure	Between Groups	2.682	3	.894	.541	.041
	Within Groups	835.689	396	1.652		
	Total	838.371	399			
Natural Disorders	Between Groups	48.962	3	16.321	6.910	.000
	Within Groups	1195.056	396	2.362		
	Total	1244.018	399			
Erratic Power Supply	Between Groups	60.237	3	20.079	4.720	.003
	Within Groups	2152.437	396	4.254		
	Total	2212.675	399			

experience and non-availability of seedlings and manure, natural disorders and erratic power supply ($P < 0.05$). So, it revealed that the years of experience is influenced by the problems in cultivation and maintenance (**Table-5**).

Table – 6
Influence of Problems in Cultivation and Maintenance on Possession of Land

The ANOVA table revealed that there is a significant difference exist among the possession of

Problems in Cultivation and Maintenance		Sum of Squares	df	Mean Square	F	Sig.
Non-Availability of seedlings and Manure	Between Groups	3.769	1	1.256	.762	.416
	Within Groups	834.602	398	1.649		
	Total	838.371	399			
Natural Disorders	Between Groups	21.626	1	7.209	2.984	.031
	Within Groups	1222.392	398	2.416		
	Total	1244.018	399			
Erratic Power Supply	Between Groups	12.015	1	4.005	.921	.031
	Within Groups	2200.660	398	4.349		
	Total	2212.675	399			

land and natural disorders and erratic power supply ($P < 0.05$) except non-availability of seedlings and manure ($P > 0.05$). So, it revealed that the possession of land is influenced by the problems in cultivation and maintenance (Table-6).

Table – 7
Influence of Problems in Cultivation and Maintenance on Area of Cultivation

Problems in Cultivation and Maintenance		Sum of Squares	df	Mean Square	F	Sig.
Non-Availability of seedlings and Manure	Between Groups	16.744	3	16.744	10.353	.001
	Within Groups	821.626	396	1.617		
	Total	838.371	399			
Natural Disorders	Between Groups	.001	3	.001	.000	.021
	Within Groups	1244.017	396	2.449		
	Total	1244.018	399			
Erratic Power Supply	Between Groups	14.757	3	14.757	3.411	.015
	Within Groups	2197.918	396	4.327		
	Total	2212.675	399			

The ANOVA table revealed that there is a significant difference exist among the area of cultivation and non-availability of seedlings and manure, natural disorders and erratic power supply ($P < 0.05$). So, it revealed that the area of cultivation is influenced by the problems in cultivation and maintenance (Table-7).

Factors influencing the prospects of coconut growers:

The demand for coconut products world over is high and it is everlasting. Given this scenario, there is a lot of room for coconut growers to develop and prosper. But there are still certain areas where adequate steps be taken by coconut growers in order to reap better yield and also to sustain in this field so that the demand for coconut products is adequately met. This coconut farming suffers from various maladies such as poor Incentives and subsidies from the Government, insufficient research and development, lack of adequate access to technological up-gradation, stringent formalities for accessing to bank loans, lack of adequate training to coconut growers, poor insurance cover, lack of awareness to usage of modern equipments, lack of logistics to overseas markets, untimely and difficulty in gathering the market information, difficulty in getting input materials at a subsidised rate and inability to collective bargaining. If these maladies hampering the growth of the coconut farming are adequately addressed and rectified, there is a much larger prospect for coconut growers in terms of reaping the benefits economically and efficiently.

Hence, this research article adequately deals with the factors that serve as bottle necks to the growth and development of coconut farming and also provide remedies to these factors. As a result, the growth and development of coconut farming is ensured and sustained, thereby benefiting the coconut growers economically. The opinion elicited from the coconut growers forms the basis of identifying these factors and based on these opinions, sufficient steps be taken to remove these bottlenecks in order to provide a better level playing field for coconut growers.

Coconut growers' expectation towards betterment of performance of coconut fields:

To know, the variation among the various expectation of coconut growers towards the betterment of coconut fields. In this regard, Friedman's test has been used to know the influencing factor among the coconut growers.

Table 8
Prime Factors Influencing Prospects of Coconut Growers

Variables	Mean	Std. Deviation	Mean Rank	Chi-Square	df	Sig
Incentives and subsidies from the Government	22.01	2.55	8.65	4448.7	10	.000
Strengthening of research and development	20.53	2.05	8.25			
Technological up-gradation	15.74	2.08	6.47			
Hassle free rules and regulations to bank loan accessibility	15.67	2.47	6.46			
Training to coconut growers	8.58	1.14	2.82			
Insurance	8.29	1.34	2.44			
Access to modern equipments	8.39	1.28	2.53			
Tapping of export market potential	12.47	1.83	5.04			
Access to easy market information	8.26	1.02	2.34			
Providing input materials at subsidised rates by the government	3.67	1.001	5.05			
Farming coconut cartel to reap the common benefits	3.61	1.022	4.80			

The results of

Friedman’s Chi-Square test explored that there is a significant difference among the variables of prospects of coconut growers. ($\chi^2=4448.77$, $P<0.05$). The mean ranks revealed the fact that the coconut cultivators’ expecting incentives and subsidies from the government (22.01) are more influenced among the coconut growers followed by strengthening of research and development (8.25) (Table-8).

Research on coconut and its marketing is a continuous process during the last few decades and number technologies have been developed related to coconut cultivation, maintenance, crop improvement, crop protection, cropping system etc.

The Coconut Development Board and state agricultural universities are not only instrumental in developing technologies to the farming community. Application of modern equipments, cultivation technology, and modern inputs such as: manure and boosting chemicals are developed to make coconut farming economically viable and more acceptable to the farmers.

The problems of coconut growers become more acute when the price falls drastically. So, to increase the income of the farmers, adoption of coconut based intermix cropping system should have to be practiced to use the space more efficiently which are otherwise being wasted. Recently vanilla is cultivated as an intercrop which helps to earn more profit to the farmers. Intercropping is the solution to get more returns from a unit holding. Banana, pineapple, tapioca, elephant foot yam, chillies, snakeguard, bitter guard, brinjal, tomato, bottle guard are the profit earning intercrops used in coconut fields. Coconut based farming system is highly suited bee-keeping, piggery, poultry, breeding milk cow etc. are also recommended for additional revenue to coconut growers. Many coconut growers are of the opinion that high age coconut palms (say more than 50 years) will provide low yield of coconut. So, they can uproot their old trees and cultivate hybrid varieties to get quick and high yield of coconut within a short period.

Findings:

This study was carried out meticulously to analyse the performance of coconut growers towards their field in Pollachi Taluk in Coimbatore district. The performance of coconut growers was analysed in the light of various factors such as: infrastructural facilities, government assistance, performance of labour, financial assistance and marketing performance. The prospects of the coconut growers for their growth and development were identified and appropriate suggestions were highlighted through eliciting the opinion of coconut growers in this regard. Various statistical tools, such as factor analysis by principal component method, one-sample 't' test, Friedman's test, K-means cluster analysis and One-way Analysis of Variance were used to analyse the performance of coconut growers in Pollachi

Taluk of Coimbatore district. The results of the analysis were given in the form of findings, and based on these findings, suitable suggestions for improving the performance of coconut growers were presented in this chapter.

Factors contributing to problems of cultivation and maintenance:

- The variance explained by the seven variables of factors contributing to problems in cultivation and maintenance are power interruption, frequent attack of pests and diseases, monsoon failure, high cost of fertilizer and boosting chemicals, non-availability of quality fertilizer and boosting chemicals, depletion in ground water level and non-availability of quality seedlings.
- The Kaiser-Meyer-Olkin measure and Bartlett's test for sampling adequacy for seven variables are found to be 0.560 and the Chi-square value of Bartlett's test for Sphericity is 86.23. This clearly indicates that all the seven variables are different and perfectly distributed in a normal distribution.
- It is found from the component matrix table that the first factor consisted of three variables and named as, 'non-availability of seedlings and manure'. The second factor consisted of three variables and it is known as 'natural disorders'. The third factor consisted of one variable which are called as 'erratic power supply'. It is also observed from the above table, the coconut growers are affected by 'non-availability of seedlings and manure, natural disorders and erratic power supply.

Influence of problems on profile of coconut fields:

The eleven pre-dominant problems, as revealed by factor analysis on profile of coconut field have been analysed to measure their influence. The said problems have been taken as dependent variables

and profile of coconut field such as: years of experience in coconut cultivation, possession of land, area of coconut cultivation, variety of coconut palms cultivated, age of coconut trees, type of irrigation and total annual yield of coconut nuts as independent variables on dependent variables. One-way

Analysis of Variance (ANOVA) IS applied to find out the influence of independent variables on dependent variables. The following are the inferences from the study:-

- The ANOVA table revealed that there is a significant difference exist among the years of experience and non-availability of seedlings and manure, natural disorders and erratic power supply ($P < 0.05$). So, it revealed that the years of experience is influenced by the problems in cultivation and maintenance.
- The ANOVA table revealed that there is a significant difference exist among the possession of land and natural disorders and erratic power supply ($P < 0.05$) except non-availability of seedlings and manure ($P > 0.05$). So, it revealed that the possession of land is influenced by the problems in cultivation and maintenance.

Suggestions:

- Power supply should be provided round the clock to enable coconut growers to sustain coconut farming.
- Proper irrigation facilities should be tapped by coconut growers by resorting to the combination of various irrigation methods to ensure that coconut trees receive adequate and timely watering.
- The government should formulate policies and programmes in such a way that they are to be considered as coconut growers friendly.
- Government should support and giving the coconut growers a helping hand so that coconut growers reap the maximum benefits.
- The government should encourage the coconut growers to set up a cartel which is monitored by the agricultural officers in order to help the coconut growers to fix the selling price of their produce based on time to time market behavior.
- The government should make available quality fertilizers and boosting chemicals at reasonable costs at appropriate time.
- The agricultural officers should gather the monsoon conditions from metrological department time to time and pass them on to coconut growers so that loss on accost of natural disasters can be mitigated.

- Adequate support should be provided by various agencies associated with coconut farming to strengthen research and development infrastructure and technological up-gradation so that coconut growers benefit out of the outcomes of the research and development with regard to cultivation, maintenance and marketing of coconut produce.
- Coconut Development Board should create awareness among coconut growers about the benefits of drip irrigation system and help and support the coconut growers to set up drip irrigation infrastructure by providing them subsidies and incentives.
- Government must take necessary arrangements to increase the export of coconut and its products. In the last decade there is a high demand for coir products in the international market. The people of UK, USA and certain African countries are started consuming coconut and its by-products. So, there will be a rapid increase in the export market for coconut and its by-products.

Conclusion:

Though there are few problems in cultivation, maintenance and marketing of coconuts, no doubt coconut is a price crop and has continuous demand both in domestic and international market, especially coconuts produced from Pollachi taluk has possessed a great demand all over the world. So, all of the above said suggestions can be generalised and applied to all states in our country to reap maximum production of coconut. The availability of wide range of agro-climate regions, gene-pool of coconut, skilled human resources, traditional and modern production and processing technologies altogether provide this sector a special status in the Indian Economy.

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