

Economics of Coconut Products-An Analytical Study

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Introduction

The present study on the economics of coconut products is very pertinent, considering the importance of coconut production in terms of its contribution to Kerala's SDP and providing livelihoods to lakhs of people directly and indirectly. The study makes an attempt to understand the economic importance of coconut products and the challenges the Indian coconut products are facing from similar coconut producing countries in the world. Stability in the prices of coconut products is necessary for the development of the crop as it involves large investment and long germination period. Forecasting the prices of coconut products may reduce the risk involved in the cultivation of coconut by supplying additional information about possible outcome.

Significance of the Study

The price fluctuations in coconut products severely influence the cultivation of coconut. During 1999-2001, there was a sharp decline in the prices of coconuts by 75 percentage. To make coconut cultivation remunerative it is essential to diversify. For diversification it is essential to understand the economics behind diversification. The prices should be attractive to farmers so that they continue to invest and undertake coconut farming for their prospective growth. For the product based industry the prices should be remunerative for its survival. Even for diversified coconut products price fluctuations due to international forces and substitutes are very important. In this context, it is essential to analyse the price fluctuations of coconut products so as to arrive at policy suggestions.

Research Design

Research issues

- 1) How far the area, production and productivity of coconut changed during the pre and post-Liberalisation period.
- 2) How far the prices of coconut products fluctuated during the pre and post-Liberalisation period.

- 3) Whether market fluctuations in prices affect the export and import of coconut products.
- 4) Whether there is stability in the prices of coconut products in the future.

Objectives of the Study

- 1) To study the area, production and productivity of coconut in India with special reference to Kerala.
- 2) To study the effect of Liberalisation on the prices of coconut products in Kerala.
- 3) To study the trend in export and import of coconut products during the study period.
- 4) To forecast the prices of coconut products using Time Series Model.

Hypotheses of the Study

- 1) There is a significant price difference in coconut products during pre and post-Liberalisation periods.
- 2) Price variations among different market segments in Kerala are not significant.

Scope and Coverage of the Study

The present study based on coconut products is to understand the economic importance of coconut cultivation and the scope of coconut products. The coconut cultivation in India and major States in India for the period 1974-75 to 2007-'08 has been analyzed to understand the trend in area, production and productivity of coconuts. This is done with special reference to Kerala. In the case of Kerala, all the fourteen districts have been selected for making a detailed study. The study covers a period of 34 years-dividing it into pre and post-Liberalisation period, covering 17 years before and after 1991. First period 1974-75 to 1990-91 has been selected because it is the pre-Reform period and by analyzing the trend in the price and production of coconut products, we can understand the importance of the New Economic Policy of 1991.

The second period is from 1991-92 to 2007-08. This period was very crucial for agricultural commodity trade. This is to analyze the immediate impact of New Economic Policy and WTO agreements. The scope of the study is limited to only three markets-Kochi, Alappuzha and Kozhikode

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and three coconut products-coconut oil, copra and coconut oil cake. The present study has analyzed the area, production and productivity of coconut in India with special reference to Kerala, the trend in the prices of coconut products and the trend in export and import of coconut products during the study period and the issues associated with it. For forecasting the prices of coconut products such as coconut oil, copra and coconut oil cake, the study is restricted only to the Kochi market.

Data and Methodology

The importance of coconut products in India and Kerala, the challenges to it, its problems and reasons have been studied with secondary data. As this study attempts to analyze the performance of coconut products in Kerala in the context of New Economic Reforms, the year-wise data for the whole period from 1974-75 to 2007-2008 has been analyzed in detail. For forecasting the prices of coconut products, the average monthly prices of coconut oil, copra and coconut oil cake of Kochi market for the period from 1st January 1995 to 31st December 2010 have been taken.

The secondary data collected from different sources are mentioned below.

Sources of Secondary Data

Secondary data was mainly collected from Coconut Development Board, Ministry of Agriculture, Government of India, Kera Bhavan, Cochin. Other relevant data were collected from various government reports like Economic Reviews, Economic Surveys, Data published by the Directorate of Economics and Statistics, Centre for Monitoring Indian Economy, Agricultural Statistics and Various Reports of the Commission on Agricultural Costs and Prices.

Tools of Analysis

The study has used simple statistical techniques like Percentage, Ratio, Average, One-way ANOVA, Co-efficient of Variation and Trend Analysis to present and draw inference from the data produced.

Chapter Scheme

The study is divided into seven chapters. The contents of each chapter are explained as follows:

Chapter one starts with the introduction, research issues, objectives of the study, hypotheses, data sources and methodology, importance of the study, chapter scheme, conceptual framework and social relevance of the study. Review of earlier studies and limitations of the study are also presented in the first chapter. Chapter two gives an overview of coconut and the important coconut products. Chapter three explains the area, production and productivity of coconut in India with special reference to Kerala. Fourth chapter deals with the

analysis of the prices of coconut products such as copra, coconut oil and coconut oil cake. The price level of three markets (Kochi, Alappuzha and Kozhikode) has been presented and analyzed during pre and post-Liberalisation period. Fifth chapter presents the foreign trade of coconut products during the study period. Chapter Six uses the average monthly prices of coconut products of the Kochi market from 1st January 1995 to 31st December 2010 and forecasts the future prices of coconut products. Seventh chapter concludes the study and makes some policy suggestions.

Limitations of the Study

The study 'Economics of Coconut Products-An Analytical Study' has been conducted based on secondary data. All the limitations and drawbacks of a study while using secondary data can be seen in this study also. The study has selected the period of analysis only from 1974-75 to 2007-08. The impact of global warming and climate changes are other factors which have led to changes especially in production and productivity. This study has not made any attempt to understand their impact on the study. Only three coconut products such as copra, coconut oil and coconut oil cake have been considered for the purpose of study. The study is limited to three markets, viz. Kochi, Alappuzha and Kozhikode. In two or three markets also in India there is trading in coconut products. But that has not been considered. The nature of marketing channels, price spread and the coconut cultivators share in the consumer price of coconut are not explained in the thesis. Cost of cultivation is an important factor which determine the acreage response but this aspect is not given due importance in the study because the study focuses on price variation.

Major Findings of the Study

There is considerable decrease in the growth rate of area, production and productivity of coconut in India during the post-Liberalisation period compared to that of the pre-Liberalisation period. The exponential growth rate of the area of coconut cultivation in India has decreased from 2.16 to 1.32. In the case of coconut production the exponential growth rate has decreased from 2.99 to 1.4 percentage and that of productivity from 0.7 to 0.2.

The total area and production of coconut in Kerala was the highest, compared to other Indian States during the pre-Liberalisation period. In 1974-75, Kerala's share in the total area of cultivation of coconut stood at 67.02 per cent of India's total area of cultivation of coconut. But it showed a diminishing trend till 1990-'91 and it was 57.08 per cent in 1990-91. The States of Karnataka and Tamil Nadu stood in the second and third position.

The analysis of the percentage area of coconut cultivation during the post-Liberalisation period reveals that in Karnataka and Tamil Nadu states the percentage shows an increasing trend. Whereas in Kerala, though the percentage of total area of cultivation is the highest among the states (55.35 per cent in 1991-'92), the growth rate shows a decreasing trend, which decreased to 43.02 per cent in 2007-08.

The share of coconut production of various Indian States during the pre-Liberalisation period revealed that Kerala stands first in coconut production among all other Indian States during the pre-Liberalisation period. The percentage stood at 61.67 in 1974-75. However, the percentage of production shows a significant decrease till 1983-84. Thereafter it shows a fluctuating trend. The percentage decreased to 46.67 in 1990-91.

The share of Kerala in the total coconut production of India was 55.35 per cent in the year 1991-92. But the percentage shows a decreasing trend, except in the year 1992-93. The percentage decreased to 43.02 in 2007-08. But in the case of Karnataka and Tamil Nadu, it shows an increasing trend.

The State-wise productivity of coconut showed that the leading coconut producing States in India, viz. Kerala and Karnataka, have been showing more or less a constant productivity for the period from 1974-75 to 1990-91. In 1974-75 the productivity of coconut in Kerala was 4970 nuts per hectare and in 1990-91 it was 5239 nuts per hectare. Kerala showed an increase trend in productivity in the post-Liberalisation period, but it was at a much less rate when we compare the growth of productivity of Tamil Nadu and Maharashtra in the pre-Liberalisation period. In 1991-92 the productivity of coconut in Kerala was 4969 nuts per hectare and it increased to 6889 nuts per hectare in 2007-08.

The exponential growth rate of the area of coconut cultivation in Kerala has decreased from 0.99 to -0.26. But in the case of coconut production and productivity the exponential growth rate has increased, from 0.91 to 1.30 in the case of production and from 0.7 to 1.43 in the case of productivity.

The district-wise area of coconut cultivation in Kerala shows that during the year 1974-75, Kollam district has the largest area of coconut cultivation with 107409 hectares (14.36 per cent) and Idukki district with the smallest area of 23040 hectares (3.08 per cent). But in the year 1990-91, the highest contribution was that of Kozhikode district with 122062 hectares (14.03) and Wayanad having the smallest area of 4510 hectares (0.52 per cent).

During the post-Liberalisation period, Kozhikode district has the largest area of coconut cultivation and Wayand district having the smallest area. In 2007-08, the area of coconut cultivation of Kozhikode

stood at 122929 hectares (15.01 percent) and that of Wayanad at 12292 hectares (1.50 per cent).

The exponential growth rate of the area under coconut cultivation in the State during the pre-Liberalisation period is positive for all the districts except for Kollam, Alappuzha, Kottayam and Kannur. But during the post-Liberalisation period, all the districts showed a negative growth rate except Idukki, Palakkad, Malappuram, Kozhikode Wayanad and Kasaragod.

The district-wise production of coconut in Kerala shows that during the year 1974-75 Kollam district had the largest coconut production with 531 million nuts (14.28 per cent) and Palakkad district with the smallest production of 83 million nuts (2.23 per cent). But during the post-Liberalisation period the contribution of Kozhikode district is the highest and Wayanad the smallest. In 2007-08, the total production of coconut in Kozhikode district stood at 851 million nuts (15.09 percent) and that of Wayanad at 45 million nuts (0.80 per cent).

In the post-Liberalisation period, the district-wise production of coconut in Kerala shows that some of the leading producers in coconut like Kozhikode, Kollam, Thiruvananthapuram, Ernakulam have been registering a decline in the share in production in the post-Liberalisation period. But districts like Palakkad, Kasaragod and Wayanad have been gaining in the percentage contribution of production.

The exponential growth rate of the coconut production in Kerala during the pre-Liberalisation period is positive for all the districts except Thiruvananthapuram, Kollam, Pathanamthitta, Alappuzha, Kottayam and Idukki. But during the post-Liberalisation period all the districts showed a positive growth rate except Pathanamthitta, Ernakulam and Kozhikode.

The district-wise productivity in the State revealed that Thrissur district has the highest productivity with 5895 (nuts per ha) in 1974-75. Thiruvananthapuram district occupies the second position with 5771 (nuts per ha.). In 1990-91, Thrissur district retained its position, but the productivity of coconut has plummeted to 5750 (nuts per ha.) and for Thiruvananthapuram district also the productivity of coconut has come down to 5293 (nuts per ha.).

In the post-Liberalisation period the productivity of coconut experienced a more or less steady and gradual increase from 1991-92 onwards. There has been a very high growth rate in all the districts compared to the pre-Liberalisation period. The productivity of coconut in 2007-08 was highest in the Malappuram district with 7944 (nuts per ha.) and the smallest in Idukki with 3614 (nuts per ha.).

In the pre-Liberalisation period, most of the districts showed a negative growth in productivity

whereas in the post-Liberalisation period the productivity is positive for almost all the districts of Kerala, except for a few districts like Idukki, Ernakulam and Kozhikode.

In the pre-Liberalisation period, the price of copra showed a very encouraging trend in all the three markets-Kochi, Alappuzha and Kozhikode. Nearly 12 per cent increase in the price of copra in the pre-Liberalisation period was giving much incentive to the cultivation of coconut. There seems to be fewer fluctuations in the price of copra in the pre-Liberalisation period.

The growth rate in the price of copra in the post-Liberalisation period has been very dismal. The rate of growth of price in the post-Liberalisation period has been less, mainly due to the fluctuation in the wholesale price of copra due to the free and open trade with other coconut producing countries in the world. The growth rate of copra in the post-Liberalisation period has been only less than half of the growth rate of pre-Liberalisation period and there is not much variation in the price of copra among three markets,

The copra price shows a sharp decline in the growth rate of its price in the post-Liberalisation period compared to the pre-Liberalisation period. In the three markets (Kochi, Alappuzha and Kozhikode), in the pre-Liberalisation period the exponential growth rate of copra was more than 8 per cent, but in the post-Liberalisation period the price in the same markets was less than 3 per cent. This shows the coconut economy of Kerala suffered a lot due to the New Economic Policy of 1991.

There is no significant difference in the price of copra among Kochi, Alappuzha and Kozhikode markets during the pre and post-Liberalisation period.

As in the case of copra, the coconut oil also shows a very high increasing growth rate in the pre-Liberalisation period. The price of oil in all the three markets has registered an almost equal growth rate and it was nearly 10 per cent.

The trend in the price of coconut oil in the post-Liberalisation period has been very discouraging and it has far reaching consequences in the cultivation of coconut. There has been much less growth rate in the price of coconut oil in all the three markets.

The price of coconut oil shows a sharp decline in the growth rate in the post-Liberalisation period compared to pre-Liberalisation period. In the three markets (Kochi, Alappuzha and Kozhikode), in the pre-Liberalisation period the growth rate of coconut oil was nearly 8 per cent but in the post-Liberalisation period the price in the same markets was less than 2 per cent. This shows that due to the New Economic Policy of 1991, the coconut economy of Kerala has suffered a lot.

There is no significant difference in the price of coconut oil among the three markets-Kochi, Alappuzha and Kozhikode during the pre and post-Liberalisation period

There has been a disparity in the price of coconut oil cake in the three markets during the pre-Liberalisation period unlike in the price of coconut oil. The prices of coconut oil cake in the Kochi market have registered a high growth rate compared to Alappuzha and Kozhikode markets. Kochi market registered deceleration in the growth rate of coconut oil cake in the post-Liberalisation period. The other two markets also register a decreasing growth in the post-Liberalisation period in the coconut oil cake price.

In the three markets (Kochi, Alappuzha and Kozhikode), in the pre-Liberalisation period, the growth rate of coconut oil cake was more than 5 per cent but in the post-Liberalisation period the price in the same markets was less than 5 per cent. This shows the coconut economy of Kerala has suffered a lot due to the New Economic Policy of 1991.

There is no significant difference in the price of coconut oil cake among Kochi, Alappuzha and Kozhikode markets during the pre and post-Liberalisation period.

Indonesia leads in the area and production of coconut cultivation in the world followed by the Philippines, India and Sri Lanka. The area devoted for the production of coconut in India has been very low, compared to Indonesia. But India and Indonesia have almost an equal production of coconut in terms of volume.

India has the leading productivity in coconut in the world. India's productivity is more than the productivity of Indonesia and the Philippines and India has been sharing almost the same productivity of Sri Lanka. It is mainly due to high productivity that India has been enjoying a leading position in coconut production despite of the fact that the area under coconut cultivation in India has been almost half of the area devoted to coconut cultivation in Indonesia and the Philippines.

Compared to the pre-Liberalisation period, in the post-Liberalisation period, the import of copra, coconut oil and cocout oil cake has been very high and it may be due to the liberal trade policies of the Government of India.

In the pre-Liberalisation period, the exponential growth rate of the import of copra was -23.41 in terms of volume and -29.53 in terms of value and it has increased to 8.1 and .23 in the post-Liberalisation period. In the case of coconut oil it increased from -22.75 and -4.05 to 15.3 and 19.41 and in the case of coconut oil cake it increased from -71.44 and -57.81 to 77.85 and 77.12.

A similar pattern is followed in the case of exports also. The exponential growth rate of the export of copra in the pre-Liberalisation period was -15.61 in terms of volume and -27.11 in terms of value and it has increased to 24.54 and 18.41 in the post-Liberalisation period. In the case of coconut oil it increased from 5.07 and 12.79 to 26.56 and 24.02 and in the case of coconut oil cake it increased from -1.67 and 5.68 to 1.59 and 6.79 and we can conclude that Liberalisation resulted in a healthier market earning.

The price behaviour of coconut and its products has a profound influence on the rural economy of many States in India, especially Kerala. The two models fitted for forecasting the average monthly prices of the coconut oil, the Holt-Winters Additive Exponential Smoothing has RMSE 264.913 and gives better predicted values than the Seasonal ARIMA whose RMSE is 272.394. So the best model for forecasting the oil price in the Kochi market is the Holt-Winters Additive Exponential Smoothing Model. Similarly for the coconut oil cake also the Holt-Winters Additive Exponential Smoothing has lesser RMSE than the corresponding seasonal ARIMA model. In the case of forecasting the average monthly prices of copra the best fit is given by the Holt-Winters Multiplicative Exponential Smoothing. So in general, it is concluded that the best model for forecasting the coconut products price is the Holt-Winters Exponential Smoothing Model, vis-a-vis the seasonal ARIMA model as far as the Kochi market is concerned. The real price of the product seems to be within the predicted limits for the months of March to June 2011.

Coconut prices are usually low during April, May and June while they peak in November, December, and January. Lower availability of milling copra for crushing puts oil at its peak price during the months of November, December and January. The foremost price driver of coconut oil price is the upcountry demand at any given point of time.

The last three decades witnessed a reduction in the demand for coconut oil due to the availability of cheaper oils and the propaganda against coconut oil linked with health hazards. The comparatively high price of coconut oil and the availability of imported palm oil at prices far below the price of coconut oil induced a significant proportion of households in Kerala to switch over to palm oil.

The price of all coconut products including raw coconut is determined by the price of coconut oil which is in turn influenced by the prices of other vegetable oils and the international price of coconut oil. The changes in the consumption pattern of coconut oil may result in huge hike in the price of coconut oil in the domestic and international market. The increase in the price of other edible oils such as

soyabean oil, palm oil, palm kernel oil and sunflower oil due to increased demand for them and its shortage in the supply are likely to continue for the coming years also. Hence, the price of coconut oil may also continue to rule at an increasing rate in the coming future.

Coconut industry in the country at present is on a revival path for product diversification and value addition. The coconut has been a growing success since the time it was first discovered and to this day this very diverse plant is showing great potential. "Our thanks to the Divine Providence which made this tree well worthy of the title of the king of vegetables, with its sap, its fruits, its leaves, its stem, its roots and all its parts, to feed, appease, shelter, cure and carry mankind". Jose 'Maria de Sa' Lisbon 1908.

Suggestions

- 1) The first and foremost thing to be taken care of in addressing the problem of the sharp decline in area is to expand the area of cultivation of coconut to non-traditional areas and to replant and rejuvenate traditional areas.
- 2) The productivity of coconuts can be increased by promoting irrigation, introducing improved varieties of coconuts and encouraging the farmers to make use of them.
- 3) The Coconut Research Station and the Coconut Development Board can set up soil research stations and also can conduct seminars to provide information about soil conservation, permanent good yield, significance of natural manures, methods of cultivation, etc. so as to help the farmers access technological research and development at the ground level.
- 4) Coconut-based farming system and primary farm level processing should be popularized.
- 5) Kerala Government along with the Coconut Development Board should take necessary steps to establish coconut-based industries either in the public or private sector. Industries based on coconut products should be established to increase the income and employment of the people in the State.
- 6) The Central and State governments should promote coconut based industries, especially the diversification of value added coconut products by providing organizational, marketing and financial support. It should also ensure the involvement of the small coconut farmers and farm workers in processing, marketing and management.

- 7) The misconception about the health implications of coconut oil can be changed by a quality literacy movement to ensure the quality of coconut and its products.
- 8) To maintain price stability, Price Support Schemes (PSS) should be implemented to ensure remunerative prices to the growers for their produce.
- 9) Utilisation of coconut and its products for various non-traditional commercial activities has to be promoted. The price fluctuations can be reduced by finding new uses for coconut oil like automobile lubricant and large-scale industrial uses.
- 10) Effective market intelligence and market promotional activities should be undertaken by the government organisations.
- 11) A more rational policy on the part of the government should be adopted on import duty structure to safeguard the interest of the coconut farmers.
- 12) When the Minimum Support Price for copra is announced the Government of India should advise the National Agricultural Co-operative Marketing Federation (NAFED) to work out a corresponding indicative price per nut separately for each State and Island and give wide publicity to it through its co-operative networks as well as through the apparatus of local administrations.
- 13) Asian and Pacific Coconut Community should strongly recommend to its member governments to concentrate on initiatives in promoting free trade zones for coconut and in hastening trade facilitation measures within the region. It is also necessary to eliminate unwanted technical barriers, harmonize standards and conformance measures and simplify and harmonize customs procedures.
