Factors Affecting Coconut Price Determinants in Sri Lanka: An Integrative Review

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ABSTRACT

Coconut is a multipurpose tree providing not only food, but, shelter and income source for tropical countries. In the Sri Lankan context, coconut has a prominent place in every kitchen. Coconut is used as; scraped coconut, coconut milk and coconut oil for the day-to-day cooking. It is a main income source for people in coconut triangle, in between Kurunegala, Puttlam and Colombo districts. Copra, coconut oil, desiccated coconut are the main export products of coconut in Sri Lanka. Today fiber and fiber related products are also booming up as export products of the country. The average coconut production was nearly 2,649 million between 1992 and 2012, The supply has changed from 2,164 to 3,096 million during this period. The per capita consumption of coconut and coconut oil is around 120 nuts per year, it is 70 percent of the total coconut production. With the increase of population this consumption value has increased. This high local coconut consumption and population growth is a major problem for the processing sector as the processing industry is facing a shortage of raw materials at present and in future. Fluctuation of coconut price is a major problem which, growers, coconut product manufactures and consumers are currently facing. Price fluctuation is mainly due to the high demand which hardly matches the supply. The objective of this paper is to discuss the factors affecting coconut price determinants of Sri Lanka. The findings of the paper can be used by policy makers for their policy decisions to identify the most significant factors influencing improvement of coconut demand and to formulate new economic strategies to achieve more profit in agricultural sector of the country. Therefore, this paper provides a timely review and an integrative framework of existing research on coconut pricing ant its determinants. This paper contributes to the economics discipline both by integrating a wide body of research on an important management topic and by offering broad avenues for further research.

KEYWORDS: Coconut, Exporting, Oil, Price, Process

Introduction

Coconut, alias "Cocos Nucifera", has a significant contribution to the Sri Lankan economy. Over 75% of nationwide production is used for internal consumption and balance 25% is used for various other purposes (Fernando et al., 2007).

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Increasing population directly impacts on increasing consumption of coconut production of the country. This has an enormous impact on the coconut processing industry and future of the industry is anticipating a great challenge. Harvesting coconut takes two months' span. Hence rainfall is the key factor of a successful crop in coconut cultivation, which direct impact of introducing policies and procedures of coconut trade. (Abeywardena, 1971; Abeywardena and Fernando, 1963).

The link between increasing population and high demand for coconut productions and consumption means that the processing industry will face big challenges due to the higher compaction and this can be influenced by the future of the industry. Coconut crop has harvested generally two-month interval. Therefore, the determination of rainfall for harvesting is an important factor. As a consequence, rainfall has become the most crucial and important factor in predicting future production and create the policies and procedures which relate to the coconut trade (Abeywardena, 1971; Abeywardena and Fernando, 1963; Peiris, 2006).

Coconut Industry in Sri Lanka

According to statistics from the Central Bank of Sri Lanka in 2019, the annual coconut production is between 2500 and 3000 nuts, and the Strategic Plan prepared by the Department of Coconut Development anticipates nearly 3,600 million crops a year as those numbers are a compulsory element to fulfill both domestic and processing requirements of the country. Industry is strategically planned with the aim to enhance the annual yield of coconut, nuts, which is estimated at minimizing the harmful effects of annual climate changes, Improvement of soil fertility, land fragmentation reductions, replanting of adult crops, pest controlling, and more activities (Central Bank, 2016). This high local coconut consumption and population growth is a major problem for the processing sector as the processing industry is facing a shortage of raw materials current and future. Figure 1 shows this situation. Generally, coconut is harvested seasonally and harvested twice a year.

Approximately 30 percent of the crop is used for industrial processing. Nut consumption has changed with the use of coconut processing products in the market. Fresh nut consumption, coconut oil, virgin oil can be identified as the main products of the processing industry, most of small-scale products, rather than value-added products in the industry. Coconut oil and dried coconut production volumes generally show the opposite direction of the volume flow over time. During the low yield period, coconut oil production reduced, and crop pieces increased from 2002 to 2006 period of time. However, 2010 was an exception to that as coconut production volume and the culinary consumption decreased, but the processing volume increased. (Coconut Development Authority, 2017).

Coconut price variances are one of the common scenarios in the marketplace. These fluctuations mainly influence the coconut growers, coconut-based product manufacturers as well as coconut consumers.

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In the last few years, coconut prices gradually increased due to low monsoon rainfalls. As a result, yield reduces from nearly 40% to 50%, especially in Colombo, Kurunegala, and Chilaw.

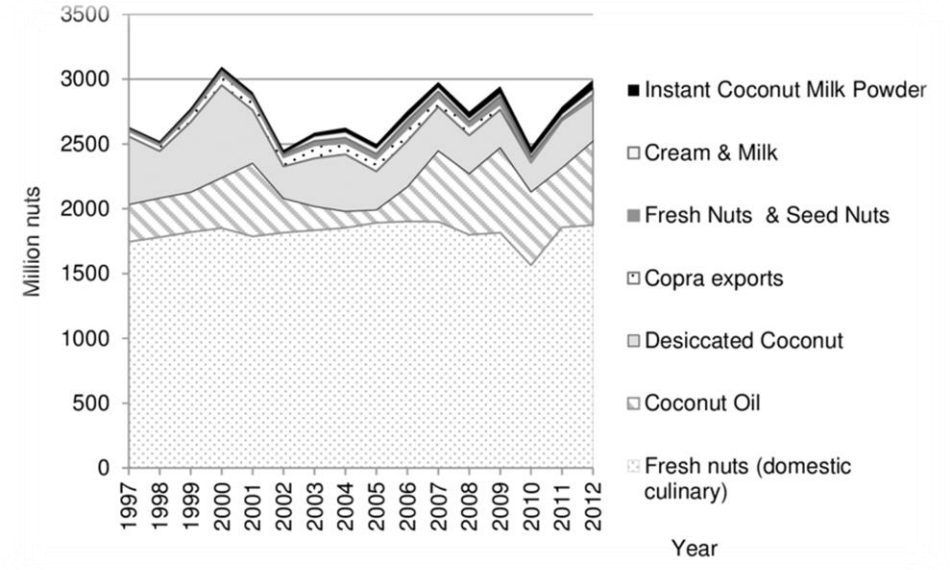

Figure 1: The Pattern of Utilization of Coconut Production Data

Source: Coconut Development Authority, 1970-2013

The weight of the nut also drastically reduced and as a result farm gate price of the Coconut increased up to Rs. 55 and the retail price of nut increased up to Rs. 100. It required nearly 240 million nuts per month for consumption and manufacturing purposes. However, in the last two years manufactures, import coconut for their manufacturing (Jayawardena, 2018). This shows that make balance of coconut supply is very much important for both consumption and industrial usage.

The main objective of this paper is to identify the main factors affecting Sri Lankan coconut market price. We investigate the impact of edible oil imports, influence of rainfall, impact of industrial usage and the impact of coconut yield as coconut price determinants.

Economic Description of Prices

Comparatively higher price leads to higher earnings and lower prices lower the income level of suppliers. When other factors remain continual it can be treated as the law of supply. A contradictory relationship can be expected in demand and supply. When the prices of product are high, high supply can be expected and, in a situation, where the product price is low, a low supply can be expected (Gans et al., 2011).

Costs Division and Marginalization

In economic context, costs are categorized as follows: explicit, implicit, fixed, variable, total, average fixed cost, average variable cost, average total cost, and marginal cost.

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Cost can be divided as variable cost and fixed cost. This cost can be expressed as the average cost per unit of the agent manufacture (Ben-David et al., 2013).

Social and Psychological Approaches to Pricing

Behavioral Theory

This theory examines the actions and activities of any individual, group, or activity in a particular organization. Behaviorism argues against the neo-classical principle of permanent rationality. As discussed earlier, the rationality principle is based on the information availability of each organization and can subsequently improve profit maximization decisions on behalf of the organization (Owen-Smith et al., 2010).

Institutional Theory

The organizational theory developed during the significant year in the social sciences from the late 19th century to the early 20th century. Its main authors were Marx, Weber, Cooley, Meade, Weblen, and Commons. This study is not acknowledged by the neoclassical school of thought in Economics but currently present here to clarify various institutional matters. The organizational approach is concerned with the organization as part of economic analysis. The organization can be seen as a well-organized community system in which groups and individuals work together to achieve defined goals and missions (Jong et al., 2015).

Cost-Plus Pricing

This is a general approach to pricing called cost-plus pricing based on estimated production costs (Weygandt et al., 2010). The marking factor includes the return level, known as the target return rate on investments. The above-estimated return ratio is straightly derived from the company's expectations rather than models of economic efficiency. Further, this theory has been used because of the relative cost of obtaining demand and cost information.

Pricing and Market Orientation

Marketing perception is the philosophy that the customer sees as the focus of the company's corporate objectives. Marketing looks at the entire business from the customer's point of view.

Cost-Based Pricing

Customer-oriented pricing focusses on the needs and wants of the customer. This includes, but not limited to customary pricing; when a specific product always keeps the price specified, demand pricing, when it examines the product demand for a different price range. The price, selection depends on the cost of production, and further, the company's overall objectives which include, profit increase, product launch, and customers' desire to pay. The main concern of psychological pricing is on customer emotions. Prestige pricing can be identified when companies decide higher prices as a signal of high-quality level products or services, such as hotels.

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Competitor-based pricing focuses on the competitiveness of the market. Penetration pricing is utilizing when the company introduces a new product at a lower price than the competition to sell the larger product quickly. Predatory pricing: is to beat companies that cannot sustain a prolonged price war, companies place lower prices on product costs.

Alternative Pricing Policies

Organizational objectives play a vital part in determining product prices. Here, has explored some of those strategies as explained in the literature. Limit pricing: when an organization varies the prices according to certain aspects of the demand surface it is specified as price discrimination. First-degree discrimination occurs when the firm varies the maximum amount a client can pay for manufacturing goods or services. This data and information are derived from an inner knowledge of the customer's situation and opinion, and thus networking with the customer takes time and effort. Second-degree discrimination occurs when the price varies by the company rely on the total amount acquired by the client.

Coconut in the Sri Lankan Society and Economy

Because of its multiple uses, the coconut tree benefits the people of Sri Lanka in various and multiple ways. The Coconut tree is frequently referred to as the "Tree of Life" or "Kapruka" because it has a significant donation to the well-being of the people as well as the livelihood of the country. Further it significantly contribute towards the national economy of Sri Lanka. It is globally known as one of the world's most important trees and crops that give food and shelter to millions of people in developing countries, including Sri Lanka. The total coconut contribution to Sri Lanka's export earnings, including kernel and non-kernel products, is close to 4 percent (Coconut Development Authority, 2017). The coconut sector in Lanka is expected to contribute employment to about 6.5 million people (Ministry of Plantation Industries, 2006).

Economic Structure of the Coconut Industry

The main coconut cultivation area of the coconut triangle consists of three administrative districts in Sri Lanka which include: Kurunegala, Puttalam, and Gampaha. This region consists of 57 percent of total coconut land. The Southern province can be identified as the "Small Coconut Triangle" which includes the administrative districts of Galle, Matara, and Hambantota. Coconut plantations in the Southern province comprises of about 12 percent of the land. Except for the coconut-growing central highlands, coconut is distributed throughout the country. The coconut processing sector consists of two distinct sub-sectors: kernel and non-kernel products. Here, as major kernel products can identify the coconut oil, desiccated coconut, copra, coconut cream, coconut milk powder, and more. Since the mid-1970s, coconut oil has become one of the dominant export products, the base of 28 percent or 683 million of the processed exports, followed by dry coconut, and this percentage value represent 15 or 380 million coconuts and then copra is around 180 followed by desiccated coconut. The value chain map of the coconut kernel manufacturing sector is well known in Sri Lanka.

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Most of the fresh coconut production requires inputs such as seedlings, fertilizers, and agrochemicals, extension services, management, and labor (Pathiraja and Weerahewa, 2013). Public Level Plantation and Contract-Based Co-operative Societies are chain operators working directly with processers. Regularly the longest chain is through the rural community level primary collectors, secondary collectors, wholesalers, and brokers to the processor (Samarajeewa and Fernando, 2004).

Recent Economic Performance of the Sri Lankan Coconut Industry

Nut Production

From 1992 to 2012, the average annual production of nuts was 2,649 million nuts, although the number of nuts fluctuated between 2,164 and 3,096 million nuts during this period. Approximately 70 percent of the total production is consumed locally in the culinary industry. The per capita annual consumption is about 121 nuts including coconut oil products. (Coconut Development Authority, 2017)

Consumption has steadily increased with the growth of the population. With population growth and stagnant demand for coconut products, the processing sector is facing tough competition for raw materials, which will affect the future of the industry. Coconut is harvested at double intervals. Product distribution throughout the year has not been satisfactory. (Mahindapala and Pinto, 1991). Coconut production is closely linked to the rainfall distribution pattern of previous years. Therefore, when rainfall is considered as the most important determinant of yield, lagging rainfall is often used in coconut yield prediction studies (Peiris et al., 2008).

Nut Processing

About 30 percent of nut production goes to manufacturing processing. The use of nuts among processing industries has changed in the recent past. But, after the use of fresh nut, coconut oil, and dried coconut are the key processing industries. Other value-added goods function on a relatively small scale (Coconut Development Authority, 2017).

The quantity of coconut oil and dried coconut products usually indicates an opposite direction of the quantity stream over time. During the little nut production period (2002-2006, 2010), Coconut oil manufacture tends to decline, and crop production quantity tends to enhance. But 2010 was an exemption to the nut manufacture quantity, as the culinary usage decreased, but the processing volume increased.

Local Market Prices

Local prices of kernel products tend to increase slightly over time due to the high demand and higher household usage. Both wholesale and retail prices of fresh nut went up during this time and moved closer to each other. The retail prices of all the nut base products varied or increase from year to year and the trend of coconut oil is increasing compared to the decreased prices of coconut and copra.

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Export Earnings from Coconut Products

The sum value of the export earnings from coconut and coconut products was US $ 46.7 billion or the US $ 0.37 billion in 2012. The coconut kernel contributed just about 36 percent of the earnings and the rest of the amount was entitled to the non-kernel sector. The value of each segment of export earnings increases over time, reflecting the expansion of fiber value-added products over the past few years. The total composition of kernel products in export earnings has also increased in recent years. Desiccated coconut is the main export product, which generally contributes 45% of earnings to the industry. Nut export prices fell until 2007, after which copra and coconut milk price have continually increased. In terms of export quantity, dried coconuts decreased slightly, and other products increased especially fresh nuts. But, in the year 2010, export income and quantity of copra and fresh nut declined rapidly. With the growth of substitute edible oils and local consumption in the global market since 1990, the export of coconut oil has been greatly reduced. Total contributions to export earnings from non-kernel products have highly increased over the past two decades. Value-added goods contributed to this vast increase. Among shell products, 94 percent of active carbon earnings are generated, accounting for nearly 19 percent of the coconut sector's total export earnings. In 2012, fiber products accounted for 44 percent of the export earnings of the coconut sector. Approximately 73% of these came from value-added products (Coconut Development Authority, 2016).

Coconut Oil Price

Most of the coconut growers in Sri Lanka have blamed the public sector for the main reason for the disaster in the old coconut oil production and the authorities have now authorized the importation of large quantities of palm oil some are suspected to be substandard and harmful to human consumption. Annual discussion of Coconut Cultivators Association (CGA) in Colombo recently, the members of the Coconut Growers Association states that "The Coconut Growers Association has faced the challenge of low farm gate prices for coconut and the main reason for this is the importation of edible oils, especially palm oil.

The Coconut Research Institute (CRI) forecast that coconut yield for 2019 will be more than 3,000 million nuts, which is higher than the last few years (Jayawardene, 2018). Since the manufacturing cost of coconut oil is quite much expensive, the sale of pure coconut oil in the market has come down and they are not able to compete with the pollution of cheap coconut oil which is now freely available. As a result of the sale of substandard palm oil mixed with pure coconut oil, the Coconut Growers Association has pointed an authority at the government for not adequately screening adultery that affects the healthcare of the nation. Cultivators complain that the government acts irresponsibly with respect to the selling of this corrupted coconut oil, which is freely available in the market.

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Edible Oil Price

The consumer study conducted by the Department of Census and Statistics explains that per capita edible oil consumption in Sri Lanka is around 4.31 kilograms per year. This shows that the total national edible oil requirement for consumption is 90,440 metric tons. Part of this demand is met by domestically produced coconut oil and the balance is supplemented with imported edible oils. Considering the total demand from other sectors, the total oil demand is around 80,000-90,000 metric tons per year. Base on Sri Lanka Custom's reports, the total import of edible oil in 2015 was 184,102 metric tons, equivalent to the country's total oil requirement. (Coconut Development Authority, 2017).

These uncontrolled import products hampered the production of coconut oil and the country has incurred a loss of Rs. 18,549 million in 2015 to import edible oils. This is 45% of the total foreign earnings from coconut kernel products in 2015. This is a value of Rs. 41,667 million. It should also be noted that palm oil is already being added to the domestic market. It has not yet been forced into the policymaking process. The tariff and tax on imported coconut oil and other edible oils were changed to a special trade levy effective since January 13, 2012. The special business tax consists of replacement oils such as pure virgin coconut oil and soybean, palm oil, sunflower seeds, saffron, cotton seeds. The 2012 budget priced Rs. 80 for crude oil and Rs. 110 per refined oils respectively. This came into effect on January 1, 2013. Pure coconut oil and palm kernel oil were not previously included in these tax rates, but they were initiated into the particular commodity tax effective January 1, 2013 (Perera, 2016).

Rainfall Affects the Price of Coconut

Rainfall in March or April has a similar effect where 400 millimeters were found to be sufficient. The higher intensity of heavy rainfall in May / August has affected the crop and increased the yield. Heavy rainfall in September or October, November, or December had a downward impact on yields and this was very important in the case of November or December rainfall. According to the multi-regression model with R = 89% was developed using a combination of several two-dimensional precipitation parameters that are useful in determining the potential yield and to some extent the yield fluctuation between years. It is more important for the farmer to maximize the yield, not just for coconut, but for any other crop (Ranasinghe et al., 2013). Rainfall is a major determinant of fruit set and yield fluctuation in coconut. Export earnings from coconut in 2017 where the USD 598.19 million, up 3% from 2016. The growth of the country's coconut processing industry, in particular, kernel-based industries, has done well in recent years, largely due to the enormous growth of existing industries such as Virgin Coconut (VCO) and fresh King Coconut. Coconut cream and coconut milk. The average annual coconut yield for 2017 was 2,450 million nuts, an increase of 17.5% compared to 2016. However, the estimated value of 2,450 million nuts is a 4% increase compared to what the CRI forecasts, due to favorable weather conditions at the end of 2017. Due to a shortage of nuts, the dry coconut industry reported negative growth.

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Due to the shortage of nuts, the cry coconut industry recorded negative growth. Further, exports of 30 million fresh nut exports were suspended (Jayawardene, 2018).

In addition to dwindling yields, drought has affected trees and the opposite is the lack of energy. The decaying trees take longer to recover and some of them will never recover. The urgent need is to develop a program to rehabilitate the coconut cultivation in the country. Almost all coconut growing districts in the country are experiencing low and unexpected rainfall in terms of size and distribution. This leads to increased air temperature, which adversely affects coconut production. Therefore, the coconut industry is facing a shortage of nuts and the price of the local market is going up. This has a severe impact on consumers as well as processors. The shortage of nut supply and the high nut price as a counterweight has put pressure on the government and forced the government to explore the possibility of importing coconuts temporarily to bridge the gap between demand and supply. Considering the risk factors, including pests/diseases and the potential disadvantages of coconut farm gates, coconut kernel was allowed to be imported under frozen conditions. It was only to meet the industry's needs and to re-export coconut production until it reached its normal level (Jayawardene, 2018).

Conclusion

Coconut usage in Sri Lanka is unique as it is the key source of oil and the main element in the culinary process and the daily diet of Sri Lankans. Household culinary uses absorb about 60-75 percent of annual coconut production in the country. With population growth and stagnant demand for coconut products, the processing sector is facing stiff competition for raw materials, which will affect the future of the industry.

According to this critical review of literature, coconut oil price, has been identified as a key factor affecting the price of coconut. Amount of edible oil imports has a direct impact on the coconut oil price of the country. But there is a huge increasing demand, for natural coconut oil and virgin coconut oil. Rainfall also has a direct impact on coconut harvest. Rainfall in March or April has a similar effect where 400 millimeters were found to be sufficient. The high rainfall in May has affected the crop and increased the yield. The urgent need is to develop a program to rehabilitate the coconut cultivation in the country. Almost all coconut growing districts in the country are experiencing low and unexpected rainfall in terms of size and distribution.

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