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ECONOMIC ANALYSIS OF COCONUT AND ARECANUT PRODUCTION SYSTEM: A REVIEW

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ABSTRACT

Presently in India (2014-15), coconut is grown in an area about 2,93,37,000 hectares and about 1,21,476 million tonnes produced with a productivity of 8285 nuts per hectares Though the modern technologies are available for increasing the productivity in the country, it is still managed to a great extent by the same way it was managed earlier. Arecanut is an important commercial crop in India. Arecanut is the seed of the arecanut palm. It plays a prominent rote in the religious, social and cultural functions and economic life of people in India. The economic produce is the fruit called 'betel nut' and is used mainly for masticatory purpose.Presently in India [2014-15], arecanut is grown in about 51,00,000 hectares and about 13,85,000 million tonnes are produced with a productivity of 224.1 kgs per hectare. India is the highest producer of arecanut in the world. Arecanut is grown in the states of India are Andhra pradesh, Assam, Meghalaya, Tripura, Mizoram, Andaman and Nicobar Islands, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, West Bengal and Pondicherry. The total production of arecanut in India is 1,38,50,000 million tonnes with an area of 51,00,000 hectares with productivity of 224.1 kgs per hectare. In case of area under arecanut in Karnataka ranks first with 23,60,000 hectares, Kerala ranks second with an area of 8,80,000 hectares, Assam ranks third With an area of 7,33000 hectares, Meghalaya ranks fourth with an area of 11.2'000 hectares, West Bengal ranks fifth with an area of 9.3'000 hectares Tamil Nadu ranks sixth with an area of 4.8'000 hectares, Andaman and Nicobar Islands ranks seventh with an area of 4.4'000 hectares, Tripura ranks eight with an area of 3.4,000 hectares, Maharashtra ranks ninth with an area of 2.2,000 hectares, Goa ranks tenth with an area of 16,000 hectares, Mizoram ranks eleventh with an area of 13,000 hectares, Andhra Pradesh ranks twelfth with an area of 0.1'000 hectares and Pondicherry ranks thirteenth with an area of 0.3,000 hectares respectively.

INTRODUCTION

Coconut and arecanut are cultivated in India since ages and they play an important role in the social, economic and cultural activities of the people. Plantation crops occupy nearly four million hectares of cultivated area in India, which forms about 23 percent of the total cropped area. Despite its low proportion to the total cultivated area, its share in GNP is highly conspicuous constituting about 27 percent of the total agricultural production. India is the third largest producer (28%) of coconut in the world with a production of about 23 million nuts from a total area of around 1.9 million hectares Indonesia, the world's top producer of, coconut, accounts 30percent of the world output it is followed by Philippines which has a share of 26 percent. Coconut is an important food item in the southern part of India and also an important oil crop. Cultivation is mostly carried out in small holdings of less than two hectares the area of 1 million hectares under coconut in India during 1971 has increased to 2.9 million hectares by the end of2014-15 and during the corresponding period the production is increased from 6 million nuts to 23 million nuts. The decomposition analysis shows that the increase in production is mainly due to the increase in area and the effect of yield is very less compared to the area effect. There was not much change in area and production during the period 1971-80 and thereafter both area and production have been rising at a steady pace in most states. Presently in India(2014-15), coconut is grown in an area about 2,93,37,000hectares and about 22147.6 million ton nes produced with a productivity of 8285 nuts per hectares Though the modern technologies are

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available for increasing the productivity in the country, it is still managed to a great extent by the same way it was managed earlier. Arecanut is an important commercial crop in India. Arecanut is the seed of the arecanut palm. It plays a prominent rote in the religious, social and cultural functions and economic life of people in India. The economic produce is the fruit called 'betel nut' and is used mainly for masticatory purpose. Presently in India [2014-15], arecanut is grown in about 51,00,000 hectares and about 13,85,000 million tonnes are produced with a productivity of 224.1 kgs per hectare. India is the highest producer of arecanut in the world.

A Brief Account of Coconut and Arecanut

The coconut (Cocosnucifera Linn) is a majestic perennial palm. Itis an important commercial crop of the world and also in India. The coconut does not appear to have been known to classical writers and, yuleand Burnell were not aware of any creek or Latin mention of it before cosrnos(545 AD). Attempts to connect the name with ancient Egyptians etymons are fanciful and Ethiopian palm described by the Theophrastus. Underthe name Kovkioopa or Koilwas certainty the Doum palm (Hyphainethebaica-Mart) Hardly more successful attempt of O.F Cook in connection with this advocacy of American origin for the coconut to connect the world coco with several central American language. Arecanut (Areca catechu Linn.) is one or the main ingredients of Tambala, of chewing of which is a habit farming luxury of the rich and poor alike. Being closely interlinked with the religious and social customs of our country, its use has spread fast. In India, use of Tambala is known from pre-vedic times having been very popular with the tantric cult. It attained universal popularity by about the first century B.C. Use of Thambula in India, in which arecanut is an ingredient is known from Vedic times, whether arecanut imported or grown in India. Its cultivation in India appears to be well known much earlier to the Christian era. It is mentioned in Rigveda as 'Devajutha', or 'Kalpavriksha', a creeper like grass which has assumed an upright position after attaining strength and is thus facing the skies. In case of area under arecanut in Karnataka ranks first with23,60,000 hectares, Kerala ranks second with an area of 9,80,000 hectares, Assam ranks third With an area of 8,33000 hectares, Meghalayaranks fourth with an area of 1,42,000 hectares, WestBengal ranks fifthwith an area of 1,03,000 hectares Tamil Nadu ranks sixth with an area of58000 hectares, Andaman and Nicobar Islands ranks seventh with anarea of54,000 hectares, Tripura ranks eight with an area of 44,000 hectares, Maharashtra ranks ninth with an area of 32,000 hectares, Goaranks tenth with an area of 16,000 hectares, Mizoram ranks eleventh withan area of 1.3'000 hectares, Andhra Pradesh ranks twelfth with an area of0.1'000 hectares and Pondicherry ranks thirteenth with an area of 0.3,000 hectaresrespectively.

This article deals with a review of the past studies relating to this review study topic is presented under the following headings.

- Variability of Productivity and prices of coconut and arecanut
- Optimum replacement age of perennial crops
- Sustainability and indicators of its measurement and
- Constraints in the production and marketing of perennial crops.

Variability of Productivity and Prices of Coconut and Arecanut

Venkataramanna and Lakshmanchar (1960), analyzed the average monthly prices of coconut, copra and coconut oil for seasonal variation at Cochin market from 1949 to 1958. Results of the analysis showed that in case of coconut, the monthly values remained above average from the last quarters of the year up to February During other months the prices remained below average. The maximum range of variation between July and August price was 8 percent of the annual mean. They also indicated that in addition to market supply, the demand for copra making and the size and quality of the nuts harvested in different months determined the prices of coconut. Copra and coconut oil prices followed almost similar trends being minimum in March and maximum in November. The maximum range of variation in prices of copra was 11 Percent of the annual mean and that in case of coconut oil 10 percent. Lakshamachar and Shamanna (1965), studied the trend and seasonal pattern of arecanut prices in the important assembling markets of Kerala and Karnataka for the period 1950-51 to 1962-63, they found that the wholesale prices of arecanut showed an increasing trend since 1954-55 in the assembling markets of Kerala and Karnataka. They also indicated that the maximum and minimum monthly prices were different in different markets.

Kahlon and Sandhu (1968), fitted a near trend using average annual prices of potatoes in Puniab. They indicated a rise of 2.65 per quintal every year and the time co-efficient was significant at one percent level. The seasonal price variation of potato was lowest in March and reached the peak in October. The price index was as low as 66.62 in March and rise to l43.17 in october, The extent of irregular fluctuations ranged from 72.49 to 144,44. Parikh (1971), analyzed the short-term fluctuations in coffee prices in the world market with the help of a spectral analysis Further, he also computed coherence and phase measures to detect linear association between the two series at each of the frequency components and to measure the time difference between the corresponding frequency components. He concluded that there was a periodic component of less than 12 months in coffee prices, which causes short-term fluctuations He suggested that the spectra remain insensitive to various trend domination procedures.
According to George and Mukherjee (1986), the growth ratio of area yield and production of rice in Kerala indicated considerable variation across the districts. He concluded that it was unlikely that the area under Paddy could be increased in the state. However, there was a scope for increase in production with the advent of technological changes. A study conducted by Das (1986), revealed high erratic nature of movement of whole sale prices of coconut, copra and coconut oil in Kerala for the period starting from 1960 to 1986 the different fluctuations in the prices were found to be caused by more than one reason The major factor behind this was the uncertainty of weather which led to Volatility in the supply demand gap in the edible oil sector in general and coconut oil sector in particular. NSP Rebello, P.G. chengappa and LalithAchuth in (1987), attempted to estimate the cyclical

patterns in arrivals and prices of coconut in four important regulated markets of Karnataka. The price series in all the markets were dominated by the prices prevailing during the years 1983-85 The trends in prices were reflected by a trend in arrivals as well, which indicates the long run supply adjustment to price The arrivals were characterized to long cycles, which extended to about 5 years in Kadur and Hosadurga and 3.1/2 years in Bangalore. By and large the amplitudes of the price cycles indicated a degree of instability in the price. However, it is observed that these cycles in qualities did not have price dependence. Bogahawatte (1988), studied the seasonal variations in retail and wholesale prices of rice in Colombo market, Sri Lanka results of universities analysis revealed that both retail and wholesale market prices exhibited seasonality in prices, Which was more Prominent in retail prices than wholesale Prices. Viiu and Prabhakaran (1988), inferred that the increasing prices and yield of rubber might have accelerated the planting of rubber in new areas and resulted !n substitution of coconut by rubber in Kerala. The author concluded that, the agrarian relation bill of Kerala which exempted rubber from the land ceiling level might have resulted in the conservation of large areas under other crops into rubber areas. Satyabalan (1993), analyzed the yield variation in west coast tall coconut palm in Kerala. He suggested mother palm selection should be restricted to those palms which yield 80 nuts or more per year as they would be able to give high yielding progeny, which won't show much yield variation., Jose (1996), analyzed the yield variability in cocoa in Kerala, based on time series model it could be seen that the yield variation of a particular quarter had an inverse relationship with yield deviation in the previous two flowering seasons of the corp. Harridos and Chandran (1997), while studying the price behavior of coconut and coconut oil in Tamil Nadu, inferred that the percentage increase in the price of coconut oil was found to be higher than that of coconut.

Optimum Replacement Age of Perennial Crops

Perin (1972), derived a set of replacement criteria using a general model of asset replacement. These criteria could be applied to both appreciating assets such as forests and depreciating assets such as equipment machinery. He demonstrated the theoretical implications of changing discount rates and market forces on the replacement decisions for various types of perennial / long term assets. Using a stochastic model for the optimal replacement age for rubber (RRIM variety) under Malaysian condition, Etherington (1977), recommended 32 years as the optimal replacement age. Tisdel and Desilva (1986), in an effort to analyze the supply maximizing and variation minimizing replacement cycles of perennial crops argued that maximum sustainable yield rather than net present values often needed to be considered for the replacement policy. They identified the length of the replacement cycle required for achieving maximum sustainable yield. They concluded that it was worthwhile exploring systems that were dependent upon multiple production units, where productivity of each unit varies with age. Nagaraj (1991), studied the replanting of coconut garden in dry land orchards. The capital budgeting technique based on net present value model indicated a replacement age of 58 years, at 10 percent discount rate. However, the regression analysis revealed that the replacement should occur at the 49th year. Based on these two approaches, it was Concluded that the optimum replacement cycle could be around 50 years rainfed condition. Asha Lama (1993)[16], identified optimum replacement time for cardamom in Sikkim by using capital budgeting technique. Baseed on the NPV model replacement could be effected at the 10th year for cardamom.

Sustainability and Indicators of its Measurement

Lynan and Herdt (1989), opined that sustainability as an objective in international agricultural research should be mandatory. They explained that how to use sustainability as a criterion to evaluate agricultural research. They illustrated the difficulties in applying the criterion. Allen (1991), defined sustainable agriculture as the one which makes use of low cost inputs, less amount of chemical fertilizers maintains soil fertility and ecological harmony. Further they concluded that the sustainability should maintain a steady increase in the biological productivity. Jordha (1991), considers sustainability as a chrematistic feature of agricultural system. He defines sustainability as the ability of the system to maintain a certain well-defined level of performance overtime and if required to enhance the same through linkage with the system without damaging the ecological integrity of the system. Rusiel (1992), in an attempt to measure sustainability, enlisted three aspects of sustainability i.e. boundaries, trends and determinant. According to him sustainability is a temporal concept. In trying to measure it need to assess trends in output overtime to ensure that they are declining. Saleth (1993), used in his study, the concept and methodology of sustainable livelihood security index (SL, SI) proposed by Swami Nathan (1991), He empirically illustrated the practical utility and policy relevance of SLSI as a litmus test for evaluating the relative agricultural sustainability of eighty agro-climatic sub-zones of India. Chopra (1993), identified sustainability as the desirable method of achieving growth while maintaining natural capital intact. Garforth (1993), observed that a farming system was sustainable if the inputs required were always available and if those components of the physical environment on which the system depends remained unchanged. Kiresur (1996), develop a mode! for estimation of the economic sustainability of improved oilseed crop production technologies. This model uses both the actual yield of the improved technology as well as the co-efficient of the regression on the site or environmental indices which in turn represent the yield levels of local farmer's practices or the production environment. They evaluated each trial or demonstration against a standard or hypothetical yield or net returns to assess the economic sustainability of a specific technology. Gopala Krishnan Remany (1998), studied the sustainable coconut farming in Kasaragod district of Kerala. She suggested that among themselves or various means to achieve sustainability. Organic matters played a key role. Organic manure application had various statutory effects on physical, chemical and biological characteristic of the soil.

Constraints in the Production and Marketing of Perennial Crops

Vigneshwara, V. (1990), identified that the constraints in the production of areca nut in Channageri and Thirthahallitaluks of Shimoga district in Karnataka. He concluded that areca nut

growers in both the taluks felt that there were lot of difficulties i.e., soil erosion and land leveling, labour for processing, irrigation management, availability of seedlings, availability of manures, availability of credit, pests and diseases and marketing. The farmers for both the taluks faced the problem of labour for processing of areca nut. Irrigation management (100 percent), problem of availability of seedlings (50 percent), manures (50 percent) and credit (50 percent) were the major problems faced by Channagiri farmers. In Thirthahatlitaluk the major problems faced were soil erosion (100 percent), occurrence of pests and diseases (100 percent) and non-availability of FYM (62.50 percent). Mahabala (1990), identified the constraints in the production of cardamom in Chickmagalur district of Karnataka. He conducted an opinion survey and classified the constraints into technical and input constraints. Among cardamom mono crop and cardamom areca nut intercrop growers 12% and 22% of the respondents felt that there was a difficulty in getting the planting material. About 10 percent of the respondents in the case of cardamom intercrop opined that disease incidence was a major problem. For 30% of the growers getting credit from different sources was a problem. For the growers 9% felt that labour was not a constraint in cardamom production.

Ashwatha Reddy (1992), identified the major constraints limiting coconut production in Trivendrum district as absence of remunerative price for the product frequent occurrence of drought and lack of irrigating; high cost and non-availability of labour in time; and occurrence of pest like rhinoceros betel and bed rot diseases. Constraints in the production of coconut was identified by paramesha (1996), as low level of input were use lack of irrigation facilities, wide spread prevalence of root wilt diseases and slow rate of replacement of the diseased and unproductive palms. HipparaziKulpathi (1998), studied the production constraints in coconut cultivation in Karnataka. The important production constraints identified by them were imbalanced use of fertilizers and poor past management. They suggested the development of integrated pest control practices to supplement biological control measures. Study made by H.I. Dalvi[31] and others on the cost of marketing margins has shown that marketing of coconut in Sindhudurg district in Maharashtra is simple and not involving many intermediaries as the demand was restricted to the district only. Most of the produce was consumed locally and hence nuts were sold by local producers to consumers. Direct selling to the consumers was found to be the most profitable one than selling through the wholesalers. The farmers got maximum share in consumers rupee, while in case of latter it was minimum. Co-operatives must therefore be encouraged to come forward in the marketing of coconuts as this channel offers better share to the producers in the consumer's price.

Conclusion

India annually produces about 23 billion nuts from an area of 209 million hectares, which is distributed in 18 states and 3 union territories. More than 90% of the area under the production of coconut in India is emanated from 4 southern states of, Kerata, Karnataka, Tamit Nadu and Andhra pradesh The crop once considered to be grown on coastal areas has now made in roads into the non-traditional areas of central and North Eastern parts of the country. Coconut contributes more than U.S $ 2400 million to the country's G.D P. Apart from an export earning of U.S. $90 million. It also provides livelihood securities to more than 20 million people in the country. Despite all these advantages, the small and medium farmers in the country who for the backbone of the coconut economy have often been pushed towards a situation of object economic deterioration which has been aggregated due to various reasons during the recent past. India is the largest producer of arecanut in the world. It is a traditional growing crop of the nation. India ranks first in area of arecanut in the world. It is estimated that more than 10 million people depend on this crop for their livelihood. Cultivation of plantation crops play an important role in the prosperity of a region. The standard of living of people engaged in plantation crops can be judged by the per unit area, productivity and income. Arecanut is an important plantation crop cultivated in peninsular and Eastern India. It is believed that India is its centre of origin. Arecanut is one of the most popular plantation crops because of its extensive use by masses for mastication. It occupies an important place in socio-religious life of our people. Arecanut is grown in the states of India are Andhra pradesh, Assam, Meghalaya, Tripura, Mizoram, Andaman and Nicobar Islands, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, West Bengal and Pondicherry. The total production of arecanut in India is 38,50,000 million tonnes with an area of 51,00,000 hectares with productivity of 224.1 kgs per hectare.

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