Role of Coconut as a Source of Vegetable Oil in India

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Introduction

Coconut is one of the traditional sources of vegetable oils in India, used for both edible and non-edible purposes. The crop plays a major role in Indian economy and contributes Rs.7000 crores per annum to the GDP of the country. About 10 million people are engaged in its production, processing, marketing and developmental sectors. The coir industry, which is a major coconut based industry earns about Rs. 240 crores per annum as foreign exchange.

India is the second largest producer of coconut in the world and is also the largest consumer of coconut oil. But it stands third to Philippines and Indonesia in the global production of coconut oil. Nearly 61 % of coconuts produced in the country are consumed raw, while 38 % are converted to copra to obtain coconut oil (Singh and Markose, 1999). At present the annual production of coconut oil in India is 4.1lakh tonnes, which is 6.5 % of the total production of vegetable oils. Indian coconut oil industry faces stiff competition, hence, increase in productivity is considered vital.

Trend in production of coconut, copra and coconut oil

The annual production of coconut (in terms of copra equivalent) and copra in India, have exhibited an increasing trend since 1989. During the period 1989 to 1997, the coconut production in the country had increased by 45 % and that of copra by 67 %. However the percentage share of copra in the total production of coconut in India, exhibited a fluctuating trend upto 1992, but the same was 39 % during 1997. During the same period the percentage share of coconut used for other purposes had marginally declined from 66 during 1989 to 61 during 1997.

Coconut oil is the major edible product of coconut and the price of coconut continues to be dependent on the price of coconut oil (Thampan, 1999). In India there are about 1400 oil mills producing 4.1 lakh tonnes of coconut oil annually of which 40 % is used for edible purposes and the remaining for industrial applications. These units are located all over Kerala, Karnataka, Tamil Nadu, Andhra Pradesh, Lakshadweep and Andaman & Nicobar Islands, of which Kerala state alone accounts for more than 85 % of the units.

During the period 1989 to 1997, the total production of coconut oil in the country had increased from 2.9 to 4.1 lakh tonnes (by 41 %). During the same

period the total vegetable oil production in India had increased from 50.65 to 62.50 lakh tonnes (by about 23%). However, between 1989 and 1997, the share of coconut oil in the total vegetable oil production in the country had increased only by 0.75 %.

Consumption pattern of coconut, copra and coconut oil

Coconut and coconut products find a ready market in India. In fact except for coir and coir products, whatever is produced out of coconut is just sufficient for domestic consumption. However, the pattern of consumption of coconut and its products in Kerala is different from the rest of the country. Out of the total annual production of coconut, about 41 % are used as raw nuts in Kerala compared to 79 % in other states. The raw nuts are used for seed nuts, for culinary purposes, as tender nuts and for the manufacture of desiccated coconut. In India on an average, 62 % of the coconut production is used as raw nuts, of which about 49 % is consumed as matured nuts, 11 % is used as tender coconut and 2.4 % for the manufacture of desiccated coconut.

About 38 % of the total annual production of coconut is converted as copra of which 30.9 % forms the milling copra and the remaining 7.5 % constitutes the edible copra. More than 55 % of the total annual production of coconut in Kerala is converted as copra for the manufacture of coconut oil, whereas in other states only about 22 % of the coconut are converted into copra.

Out of the total annual production of 3.55 lakh tonnes of coconut oil during 1993-94, 39 % is used for edible purposes, 46 % for toiletry purposes and 14 % for other industrial use. The use of coconut oil for edible purposes, mainly prevail only in Kerala, parts of Tamil Nadu and Karnataka.

Coconut oil is preferred to other vegetable oils because of its specific biochemical properties. Although it is true that 90-92% of fatty acids in coconut oil is of saturated type, 64 % of them are medium chain fatty acids like lauric acid. As compared to longer chain fatty acids, the medium chain fatty acids, have lower melting point, less calories and are not deposited to any extent in the adipose tissues or other tissues (Bach and Babayan, 1982; Chempakam, 1992). Although coconut oil has low content of essential fatty acids, it is blessed with anti-microbial and anti-carcinogenic effects. Research studies conducted in the Philippines confirmed that lauric acid purified from coconut oil is used to boost the immune response of HIV patients.

The major constraints for coconut oil to emerge as a major edible vegetable oil in the country are the diverse nature of consumption pattern and the relative price disadvantage of coconut oil as compared to other major vegetable oils in the country. A comparative analysis of wholesale prices of coconut oil and

other major vegetable oils for the period 1970-71 to 1994-95, indicated that the prices of coconut oil were higher than other vegetable oils including the groundnut oil for most of the periods. This was mainly due to the fact that unlike other vegetable oils, coconut oil is used for both edible and non-edible purposes and hence has more price inelasticity of demand (Sairam, *et al.*, 1999).

Major challenges

India is the second largest producer of coconut in the world, but to meet the internal demand, import is also resorted to in the form of copra or coconut oil. At the same time the country also exports a small quantity of coconut oil (Table 1). During the period 1993-94 to 1997-98, the quantity of imports of coconut oil did not exhibit any specific trend. However during the same period there was a steady increase in the amount of export of coconut oil. Under the present situations, the domestic demand of coconut oil is stable, however, due to likely international trade liberalization, there could be some serious threats for coconut oil especially in the non-edible sector. One of the major weaknesses of Indian coconut oil industry is the higher cost of production and hence the domestic prices of coconut oil are very high as compared to the international market (Table 2). The difference between the Indian and international prices of coconut oil was the highest during 1990 (304%) and later on the gap had narrowed down to only 59 % during 1995, but again it had reached 120 % during 1997. This exposes India's disadvantageous position with regard to the international trade of coconut oil. If this trend continues in future and unless necessary precautions are taken, the domestic prices of coconut oil would crash affecting the millions of coconut farmers in the country.

Table 1 Trend in international trade of coconut oil in India

Year	Import			Export		
	From	Qty	Value	To	Qty	Value
1993-94		3186.0	534.7		318.1	28.5
1994-95	Malaysia,	403.0	783.1	Australia, Gulf, USA, UK, etc.	542.0	379.2
1995-96	Singapore, Sri Lanka,	3601.6	809.5		544.5	392.4
1996-97	Indonesia, Philippines	4759.5	1297.8		786.9	554.3
1997-98		1318.6	382.6		1255.9	1020.6

Qty : Quantity in MT includes crude and refined coconut oil
Value : Rs. In lakhs
Source : Coconut Development Board, Kochi

Table 2 Comparative prices of coconut oil in Indian and International markets in US $/MT

Year	Indian market	International market	% increase of prices in India over International prices
1989	1488	517	187.81
1990	1558	337	362.23
1991	1749	433	303.90
1992	1753	578	203.24
1993	1284	450	185.34
1994	1031	608	69.56
1995	1065	670	58.95
1996	1258	752	67.25
1997	1448	657	120.41

In order to compete in international market, Indian coconut products are to be made cost effective and at the same time it is necessary to maintain the quality parameters. It is interesting to observe that while the demand for coconut oil in the international market is for industrial purposes, the Indian oil finds its major applications in the edible and toiletry sectors. The special aroma, flavour and quality of Indian oil always fetches a premium price. However to meet the challenges arising out of WTO, it is necessary to reshape all the sectors of coconut industry to achieve higher technical and economic efficiency through higher productivity. In addition, it is necessary to stream line the import policy of other edible oils since the past experiences indicate that imports and availability of other cheaper oils in the open market had adversely affected the price of coconut oil.

Competitiveness through higher productivity

Competitiveness through higher productivity at a reasonable cost is the only way to tackle the challenges facing coconut sector. Increase in productivity could considerably reduce the cost of production of coconut; copra and coconut oil reduced thereby benefitting both the producers as well as the consumers. Coconut palms are committed to the land for a longer period of time and it is well accepted that more productive genotypes are a good catalyst for increasing the productivity. There are about 14 high yielding varieties as well as hybrids released by the Central Plantation Crops Research Institute and the coordinating centers of State Agricultural Universities, which are suitable for cultivation in different agro-climatic conditions of the country. The basis for improvement in coconut productivity is to increase the availability of good quality planting materials of these high yielding varieties and hybrids. Adoption of management practices considerably increases the nut productivity as well as economics of coconut cultivation (Table 3 and 4). Other major factors responsible for increasing the coconut productivity are the nutrient and water

management practices. Studies conducted by CPCRI and other centers revealed that nitrogen application increased the yield of coconut by 16.9 % and that of copra by 6 %. Survey conducted in farmers' fields indicated that under *ceteris paribus*, irrigation alone increased the nut yield by over 25 %. Certain diseases like root(wilt) and basal stem rot as well as insect pests such as leaf eating caterpillar and eriophid mite are serious limiting factors in realizing full production potential. Adoption of coconut based farming systems is an effective way of increasing the coconut production. This involves the cultivation of compatible crops in the interspaces of coconut and its integration with other enterprises like dairy, poultry etc, which would increase the productivity per unit area as well as augment the gross farm income per year. Tuber crops, rice, banana, pulses, oilseeds, spices, pineapple, ornamental plants fodder crops etc., can be successfully grown as intercrops in coconut gardens. In Kerala, vegetable crops such as brinjal, amaranths and chilli were found to be suitable intercrops in coconut gardens during summer (Nampoothiri, 1999). However, the choice of these crops would necessarily depend upon the agro-climatic and edaphic factors of the region. In addition, farm resources, socio-economic aspects like labour cost and their availability and the market demand and the price stability of inter/mixed crops proposed to be taken up are also to be considered.

Table 3 Influence of management practices on yield of West Coast Tall Coconut

Management practices	Nut/palm/year
Cultivation + Organic + Inorganic manuring	117
Cultivation + Inorganic	101
Inorganic + Forking basins	113
Cultivation alone	60
Weed control with herbicides	48
No cultivation + No manuring	27

Source : CPCRI Annual Report, 1997

Table 4 Economics of coconut cultivation at different levels of productivity (Rs/ha)

Particulars	Yield levels (Nuts/palm)				
	40*	80*	100	150	200
Gross cost	11300	17000	26180	26180	26180
Gross return	28000	56000	70000	105000	140000
Net return	16700	39000	43820	78820	113820

* under rainfed conditions Based on 1998-99 prices

Value addition

Better price stability of coconut oil could be achieved by maintaining equilibrium between its demand and supply. For this, production of diversified coconut based products are to be encouraged. Diversified and value added coconut products fetch higher market prices as compared to raw nut. For example if market price of coconut is Rs.5/nut, the return could be increased to Rs.10/nut if the same is sold as Snow Ball Coconut or Coconut cream. The technologies for the manufacture of coconut-based products like coconut milk, coconut cream, desiccated coconut etc have been perfected and it is a welcome trend that industrial units are being set up in this sector in different parts of the country. In order to compete in international markets, the research and development in this arena needs further encouragement as thrust areas.

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