

AN INTRODUCTION TO PLANTATION CROPS

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INTRODUCTION

Plantation crops are high value commercial crops which play very important role in India's export trade. These crops including coconut, arecanut, cocoa, oilpalm, tea, coffee, rubber and spices occupy an area of about 4 million ha which is only 2.3 percent of the total cropped area but generate an annual income of more than Rs 2,98,500/- million and export earning of approximately Rs 30,925/- million during 1994-95. Cultivation of these crops is mostly confined to tropical region between 20° north and 20° south of equator (Table 1). Coconut, arecanut, cardamom and black pepper have a long history of cultivation in India. Cocoa and oil

palm are comparatively recent introductions. Large cardamom is an important cash crop of north-eastern India particularly in Sikkim. Among the plantation crops coconut, arecanut, cashewnut, black pepper and cardamom are known as small holder plantations whereas rubber, tea and coffee are known as estate crops or the conventional plantation crops which are generally large plantations. This group of crops serve a variety of human needs not only as food, oil, and industrial raw materials but also pungency, aroma, and flavour to food, beverages, and confectionery items. Plantation crops generate considerable employment opportunities to millions of people during on-farm operations and off-farm processing activities.

Table 1 : Plantation crops - area and production [1995 - 1996]

Crop	INDIA		INDIA'S Position in the world	EXPORT FROM INDIA	
	Area ('000 ha)	Production ('000 tonnes)		Quantity ('000 t)	Value (Mil. Rupees)
Coconut	1795.5	13967.9*	Second	43.6**	1238
Arecanut	235.5	272.4	First	0.4	36.1
Cocoa	10.6	5.7	Very low	0.3	34.2
Oil palm	38.3	10.0	Very low	0.1	5.0
Cashew	635.0	418.0	First	80.5	12400
Small Cardamom	83.7	7.0	Second	0.4	84.7
Black pepper	179.6	55.4	Second	26.2	1963
Ginger	63.5	197.4	First	18.5	389
Turmeric	136.6	435.3	First	29.0	462
Tea	424.5	780.0	First	161.7	-
Coffee	293.1	223.0	Tenth	171.0	15270
Rubber	523.3	506.9	Fifth	0.2 \$	7 \$

* Coconut production in million nuts

** Coir and Coir product

\$ For 1994 - 95

Among the plantation crops, cashew kernel export brings in the largest foreign exchange to a tune of US \$ 362 million (during 1996-97). Similarly, spices also fetch large export earnings which are estimated at US \$ 223.08 million.

Ginger and turmeric though annuals are also considered as plantation crops. India is the largest producer of arecanut, cashewnut, tea, pepper, ginger and turmeric and second largest producer of coconut and cardamom.

Table 2: Productivity levels of major plantation crops in India.

Crop	Unit	National average	Res. Station yield	Super potential yield
Coconut	nuts/palm	36	175	471
Arecanut	chali kg/palm	1	5	9
Black pepper	kg/ha	283	1100	13465
Cardamom	kg/ha	65	350	900
Cashew	kg/tree	4	16	125

(ii) Lack of adoption of technology: Though technologies are available, their adoption level is very low due to various reasons.

(iii) Fluctuations in prices: Changes in prices in global and domestic markets have caused positive and negative impacts on the industry. Marketing policy as in the case of coffee, vegetable oil import etc. contribute to these fluctuations.

iv) Perennial problems: These perennial crops always have perennial problems. Root (wilt) disease in coconut, yellow disease in arecanut, pepper wilt, ginger rhizome rot, leaf rot in coffee, Blister blight in tea etc., are some of the examples.

in the world. The overall trend in area and production of all these crops are positive and significant.

Constraints common to all plantation crops:

(i) Low productivity: Though India tops in production of coconut, rubber, arecanut, cashew, turmeric and ginger in the world map, the yield levels in some areas are lower than the possible potential yields (Table 2).

PRESENT SCENARIO

Coconut:

Coconut is a multipurpose palm serving the various human needs such as food, fibre, edible oil, feed, beverage, shelter etc.,. Coconut plays an important role in the economic, social and cultural activities of the people of India. With an area of 1.80 million hectares and an annual production of 13,968 million nuts, India ranks second in the world map of coconut. The area under coconut was 0.63 million ha during 1950-51 and it increased to 1.80 million ha during 1995-96. The increase in production for the last ten years alone was about 119 per cent. In India, more than 91 per cent of the area under coconut is in the four southern states viz. Kerala, Tamil

Nadu, Karnataka and Andhra Pradesh sharing about 92 per cent of total production. The trend in productivity of coconut in India is characterised by ups and downs. The average productivity of 5,238 nuts during 1950-51 rose to 7,779 by 1995-96. It is estimated that the production of coconut by 2000 AD may reach 20,000 million nuts from an estimated area of 2.5 million ha.

Production and productivity of coconut in India is influenced by several factors. Diseases such as the dreaded root (wilt) of coconut is affecting its production and productivity. The estimated loss in yield due to root (wilt) disease is 968 million nuts. The productivity can be increased by planting high yielding hybrids and varieties released by CPCRI and State Agricultural Universities and providing irrigation facilities. There is ample scope for product diversification in the crop and area expansion is possible in non-traditional areas.

Arecanut:

India is the largest producer of arecanut in the World, and earns about Rs. 36 million annually by exporting arecanut in various forms. Since we are self sufficient the policy of the Government is not to encourage any expansion in area, but the growers are going in a big way for replanting with the high yielding varieties because of the existing attractive price of the produce.

Arecanut germplasm collection consists of 23 exotic accessions collected from 11 countries and 45 indigenous types. Evaluation of the germplasm has led to the release of four high yielding varieties, namely, Mangala, Sumangala, Sreemangala and Mohitnagar. These varieties yield upto 30 per cent over the local cultivars and have

played a major role in achieving the self-sufficiency in arecanut production in the country. Yellow leaf disease is a most serious malady affecting arecanut productivity in Kerala and Karnataka.

Area and production of arecanut in India showed an increasing trend during the past 40 years. The area under arecanut in India was 0.106 million ha during 1955-56 which has increased to 0.236 million ha during 1995-96, an increase of 123 per cent over a period of 40 years. The production has increased from 0.081 million tonnes to 0.272 million tonnes (236 per cent increase). The productivity of arecanut remained almost constant from 1957 to 1974 with small ups and downs (around 850 kg/ha); and slightly increased thereafter during the next five years to around to 950 kg/ha, and reached the peak level of 1200 kg/ha during 1988-89. By 2002 AD the production of arecanut is estimated to exceed 3.7 lakh tonnes from an estimated area of 2.5 lakh ha.

Cashew:

It is one of the crops that is introduced for soil conservation purpose. It became a gold mine in wastelands. The constraints faced in cashew production are a) Planting in areas unsuitable for cultivation, b) Incidence of Tea-mosquito bug and c) Low productivity. Area expansion is possible in wastelands suitable for cashew. The National Cashew Gene Bank at NRCC, Puttur consist of 363 clonal accessions including 10 exotic accessions from Brazil and Mozambique. In addition, 1012 accessions mostly the local collections are maintained by the Coordinating Centres under the State Agricultural Universities. Germplasm evaluation has led to the release of 22 location specific selections in the country. In

the Crop Improvement programme, 12 hybrids with the yield potential from 1.5 to 2 tonnes of raw nuts per ha were released.

Now India is the largest producer of cashew in the world and earns more than Rs. 12,400 million annually as foreign exchange. Between 1954-55 and 1995-96, the area and production of cashew exhibited a steady of 477 percent and 429 percent respectively. During the year 1955-56 the area under cashew was only 0.11 million ha. It has increased to 0.635 million ha in 1995-96 and the production rose from 0.79 to 4.18 lakh tons. Because of the Indian monopoly of cashew in world market and the ever increasing demand and high price for cashew, the State Governments of Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra and Orissa have taken up large scale expansion programme under the Multistate Cashew Project. However Kerala continues to be the largest producing State in India with a contribution of 40 per cent.

The concerted efforts taken by Cashew Directorate, All India Coordinated Project for the improvement of cashew (established in 1972) and CPCRI, and National Research Centre for Cashew, helped in improving the productivity of Cashew. Evolving of high yielding varieties, standardization of vegetative propagation technique, increasing the availability of grafts for planting and better management practices have improved the productivity of cashew. With some of the varieties released recently having an yield potential of 10 kg per tree by the 12th year, it would be possible for us to realise an yield of 2 ton/ha if the plants are well managed.

The price of Cashew kernel in the international market is always increasing and the demand is also showing an increasing

trend. Hence the present high rate of expansion in area is likely to continue. Cashew production in India is estimated to reach 0.7 million tonnes from an estimated area of 0.7 million ha by 2000 AD.

Oil palm:

Oil palm was introduced into India in the 19th Century, but the actual cultivation was initiated only in 1960s by the Agriculture Department of Kerala. The first commercial planting of oil palm was taken up by the Oil Palm India Limited in 1971 and by the Andaman Forest Development Corporation in 1973. A boost in oil palm cultivation was given by the establishment of demonstration plots by the Department of Biotechnology and later by the effective development support by Technology Mission on Oil Seeds and Pulses. The present area of 39,413 hectares is targetted to increase to 80,000 ha by the end of the ninth plan. Andhra Pradesh, Karnataka and Tamil Nadu are the main states expected to take up oil palm cultivation.

It is possible to produce *dura x pisifera* combinations (*tenera*) with a potential production of 4.5 MT of oil/ha. Two such hybrids viz., Palode-1 and Palode-2 has been released. Simultaneously, efforts were also made to make available, planting material indigenously. Pollinating weevil (*Elaeidobtus kamerunicus*) was introduced to India during 1985 and this has resulted in increase of fruit set by 37 to 56 per cent and weight of FFB by 40 per cent.

The major problems faced by the oil palm growers are lack of processing facilities near the plantations, non-availability of sufficient quality planting material and inadequate management practices. If these constraints are removed, this crop can play a vital role in solving our edible oil problem.

Cocoa:

India produces about 5700 tonnes of cocoa beans from an area of 10600 ha and earns about Rs. 34 million as foreign exchange. It is largely grown as a mixed crop in areca and coconut gardens. The area under cocoa was showing a negative growth since the year 1983-84. The area under cocoa during 1983-84 was 22,230 ha and it has come down to 10,600 ha during 1995-96, whereas the production was fluctuating between 56,100 to 77,100 kg. By 2000 AD, the national requirement of Cocoa is projected as 14,000 tonnes.

The productivity of Cocoa is on the increasing trend. The negative trend in area under cocoa is mainly due to the lack of interest of the farmers because of severe price fluctuation and unremunerative price. The marketing of cocoa is controlled by a handful of big companies who preferred to import cocoa at lower rates rather than supporting the Indian growers.

Problems faced by the cocoa growers are inadequate collection points and processing facilities, fluctuation in prices, vertebrate pest problems and lack of availability of grafts for planting. Remedial measures are now attempted to remove these constraints.

Spices:

(i) Black Pepper:

India is the largest producer of black pepper in the world with an annual production of about 0.055 million tonnes from an area of 0.180 million ha. The country earned about Rs. 1963 million as foreign exchange during the year 1995-96. The area under pepper in India which was only 80,000

ha during 1950-51 has increased to 1,80,000 ha during 1995-96. During the sixties, seventies and upto the middle of eighties the area expansion was negligible with ups and downs. However, after 1985 this was considerable and between 1983-84 and 1995-96 there was an increase of 80 per cent.

The production of pepper in India increased from 21,000 tonnes during 1950-51 to 55,190 tonnes during 1989-90. During the past 15 years i.e. from 1983 to 1995, the increase in production was around 156 percent.

The productivity of pepper was stagnant within the range of 250-300 kg /ha with occasional ups and downs during the past 45 years. The positive trend in area as well as production is likely to continue as the demand is high in the International market. By 2000 AD pepper production is expected to reach one lakh tonnes from an estimated area of about 3 lakh ha. India has the largest germplasm accession of black pepper comprising of 2776 cultivated as well as wild accessions. Evaluation of the germplasm led to the release of six varieties and two hybrids viz., Panniyur-1 and Panniyur-4.

(ii) Cardamom:

India is the second largest producer of small cardamom only next to Guatemala. The country produce 7000 tonnes of cardamom from an area of 83,650 ha. India earned a foreign exchange of about Rs. 847 million during 1995-96. This crop is grown in the high ranges of the Western ghats. The expansion of area under cardamom was only 67 percent over the 40 years, indicating that there is not much scope for further expansion because of specific agroclimatic requirements of the crop. The area under cardamom in

India which was only 50,000 ha during 1955-56, increased to 83,650 during 1995-96. The production of cardamom is characterised with an overall increasing trend with almost stagnant production for few years with ups and downs. The trend in productivity was highly fluctuating, from 17 to 84 kg/ha without showing any regular trend. The increasing trend in area as well as production is likely to continue. Though the scope for area expansion is limited, there is scope for increasing the productivity. Five varieties of cardamom with high yield potential have been released so far.

(iii) Ginger:

India tops the world in the production of ginger, producing about 1.97 lakh tonnes from an area of 63,500 ha, and has earned a foreign exchange of Rs. 462 million in 1995-96. Ginger being an annual crop with high export potential, its cultivation depends on its price and demand. Again, it is primarily a rainfed crop and the distribution of rainfall in the cultivated areas also influences the production/productivity. Between 1973-74 to 1995-96, the area under Ginger has increased by about 173 percent.

The production remained around 15,000 tonnes from 1950-51 to 1963-64 with ups and downs and later increased gradually. The production reached the peak level of during 1995-96. The increase in production from 1982-83 to 1995-96 was over 100 percent. The productivity of ginger was found to be highly fluctuating around 1000 kg or below from the year 1950-51 to 1969-70, there after it was showing an upward trend from 952 kg/ha during 1967 to 2996 kg during the year 1995. The productivity of ginger has tripled during the nineties as compared to fifties and sixties.

Turmeric:

India continues to be the largest producer of turmeric producing about 4.35 lakh tonnes of turmeric from an area of 1.37 lakh ha, and earns about Rs 389 million annually. Turmeric being an annual crop with a large export share, its cultivation mainly depends upon the price fluctuation in the domestic and international market. The area under turmeric remained around 55,000 ha with little variation from 1950 to 1962, but there after it was increasing and reached 1,36,600 during 1995-96. The production was found fluctuating without substantial improvement from 1950-51 to 1978-79 and there after it was increasing and reached 4,35,300 tonnes during 1995-96. However the productivity has not improved much and it is less than 2000 kg/ha.

In turmeric the germplasm evaluation led to the release of 13 accessions, namely, Co-1, Krishna, Sugandham, BSR-1, Suvarna, Rome, Suroma, Rajendra Sonia, Sugana, Sudarshana, Ranga, Ranga, Rasmi, Prabha, Prathiba, Mega Turmeric and RCT-1. Some of these have the yield potential of upto 44 tonnes of fresh rhizomes per ha. Tissue culture protocols were standardised for multiplication.

Coffee:

The area under coffee was showing an increasing trend since fifties. The area which was only 92,520 ha during 1950 increased to 2,93,000 ha during 1996. The annual coffee production is about 0.18 million tonnes and the country earned Rs. 15270 million during 1995-96 as foreign exchange. The coffee production in general exhibited an increasing trend and it increased to 2,23,000 tonnes during 1996.

The productivity of coffee which was only 275 kg/ha during 1950-51 exhibited fluctuating trend and reached 760 kg/ha during 1995-96. The Coffee Board has envisaged a production target of 3 lakh tonnes by the end of IX Plan with annual growth rate of 7.5 per cent.

Tea:

India leads the world in tea production. The annual production of tea is about 7,80,000 tonnes from an area of about 0.4 million hectares. The average productivity is about 1790 kg/ha.

For tea, the scope for the expansion of area is very limited. The production may reach 0.95 million tonnes by 2000 AD, through increasing in productivity and target of 1.64 million tonnes of tea is fixed for 2025 AD.

Rubber:

The area and production of rubber were showing an increasing trend. The area was only 59,000 ha during the year 1950-51 had increased to 52,330 ha million during 1995-96, about 34 fold increase over a period of 45 years. During the same period, the production has increased from 0.01 million tonnes to 0.51 million tonnes and the country is self sufficient to meet its domestic requirement. The impressive growth rate in the area and production of rubber is the result of large scale expansion programme implemented by the Rubber Board by way of incentives and subsidies for new planting as well as for replanting with improved clones, supply of planting materials of high yielding varieties and popularizing better plant protection methods.

The productivity of rubber which was only 237 kg/ha during 1950-51 increased to

966 kg/ha during 1995-96. The estimated production of rubber will be around 7 lakh tonnes from an area of 6 lakh ha by 2000 AD and 9.5 lakh tonnes from an area of 7 lakh ha by 2011 AD.

CONCLUSION

While there is no doubt on the economic significance of plantation crops, one cannot set aside the problems faced by the industry in the present context. The major problems to reckon with is the fierce competition in the international market arising out of the policies relating to WTO agreement. Kenya in tea, Brazil in coffee and pepper, Guatemala in cardamom, several African countries in cashew and South East Asian countries in pepper, coconut and oil palm have been our stiff competitors. The available technology has to be therefore used to attain high levels of production efficiency. Since our agriculture largely depends upon monsoons, a large proportion of the produce continues to be produced under stress conditions. This makes it imperative to evolve varieties which can tolerate biotic and abiotic stresses. Other important aspects in plantation crops are conscious efforts to increase the quality of end products, product diversification and value addition.

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