Chapter II

COCONUT FARMING IN INDIA, TAMILNADU AND KANNIYAKUMARI DISTRICT

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2.1 INTRODUCTION

Cocount is one of the oldest crops grown in India. It has a recorded history of over 3000 years\(^1\). This crop occupies a unique position in the socio-economic structure of the country and it is intimately related to the prosperity of a vast multitude of small and marginal farmers especially along the coastal states of this country. It is a food crop as well as a cash crop. Although the coconut tree is grown mainly for its nuts and it provides many by-products of immense utility and industrial application.

The coconut industry in India provides livelihood to 10 million people engaged in cultivation, processing, trading, transportation and other related activities\(^2\). Coconut makes a significant contribution to the national economy.

Taking into consideration the increased demand for fresh coconuts due to the growing population and also the greater demand for convenience-oriented products owing to the increased pace of urbanization and change in life-styles, the coconut industry has great promise of growth in this country.

The growth of the coconut industry in India was marked by ups and downs during different periods of the last century. The first stage of expansion in the cultivation of the crop in India could be traced to the use of coconut oil in the production of soap and margarine in the early 19\(^{th}\) century when Europe saw an unprecedented demand for coconuts resulting in large scale planting of coconut. At the beginning of the 20\(^{th}\) century copra was the king among the oilseeds and was even called "green gold". By the end of the
20th century coconut had been dethroned from the position it held in the international trade due to low production and productivity\textsuperscript{3}.

At the beginning of the 21st century the situation has become worse due to the advent of substitute for vegetable oils and synthetics. Coconut oil is thus going to have stiff competition in the domestic and international markets. Therefore, it is the necessary to increase the production and the productivity of coconuts. The establishment of separate government institutions for the development of the industry and coordination among the various agencies dealing with coconut helped the industry very much. In India, the Coconut Development Board came into existence in 1981. The Board is playing a pivotal role for the overall development of the coconut industry in India and its programmes are integrated with the objective of increasing production and productivity besides value addition to the produce\textsuperscript{4}.

In this chapter an attempt has been made to analyze the coconut industry in the world, in India, Tamilnadu and Kanniyakumari District in general. The data used in this chapter are all secondary, collected from professional journals, research studies and technical reports and books.

2.2 HISTORICAL PERSPECTIVE

The coconut tree needs certain conditions for its growth viz., aeration of the root provided by the movement of the air through the sandy soil produced by rising and falling tides; moisture at the crown afforded by the sea breeze; and the nearness to water or sea for its efficient dispersal. Its high degree of tolerance for salinity and saline moisture, and its high degree of adaptability to dispersal by sea prove that it is a sea-side plant. It could not
altogether be termed an exclusively littoral plant as it is seen far inland at
Merida of Yucatan, at Patna in India and Timbuktu in Afira. Humboldt (1817)
cited its cultivation in Rio Magdalena more than a hundred leagues from the
coast. Blatter indicated that wherever the coconut ventured beyond the limits
of the tropics, it lost its elegance and power of productivity and sickened off
and died after eight or ten years. In support of this, he pointed out that in the
Sandwich Islands at the edge of the Torrid Zone; the coconut had a 'mean'
look. He therefore stated that the plant could be grown successfully only in the
tropics at medium and low elevations where there was either a high water
table or facilities for irrigation.

It would, therefore, appear that the area of equatorial calms
characterized by light and varied winds, heavy and regular rainfall, extreme
humidity, equable climate and warmth without undue heat could alone be the
home of the coconut.

The palm admittedly has a far wider spread in the tropics than
most other crop plants. Sampson (1929) dealing with the distribution of this
crop pointed out that it was indigenous or introduced very early in the history
of the world in India (Madras, Bombay, Bengal, Orissa and Mysore), Ceylon,
Burma, Africa (Zanzibar, Tanganyika and Kenya), federated in Malay states,
Java, Sumatra, Borneo, the Ocean Islands, Papua New Guinea, Trinidad,
British Honduras, the Ellice Islands, Fiji, the Gilbert Islands, Gold Coast,
Grenada, Jamaica, the Nauru Islands, New Hebrides, St. Kits, Swarawak,
Seychelles, the Solomon Islands and Monserrate. According to him, its
introduction into Gambia, Mauritius, Nigeria, Nyasaland, St. Vincent and
Sierra Leone was much later and its introduction into Tropical Australia was most recent. It will, therefore, be interesting to consider to which of these places the origin of the coconut may be assigned.

2.2.1 Origin of coconut

The conspicuous absence of the species of Cocos, other than the coconut, either in its wild or cultivated, from anywhere else except on the continent of America and the discovery of a grove of coconuts by Oviedo [cited by Ridley, 1930] at the Isthmus of Panama at the time of the discovery of America by Colombus in 1515, led many botanists to believe that it was of American origin. Marril [1936] also believed that the coconut having no affinities to the Asiatic genera of palm could not have evolved in Asia. Grisebach (1864) entertained no doubt on its American origin. Cook (1910) was the most emphatic advocate of this theory and he believed that the primitive agricultural people from America distributed it on the shores of the Islands of the Pacific and Indian Oceans. Thor Heyerdahl [1954] also adduced evidence to show that the coconut was introduced into the Polynesian Islands from Peru. Martius (1850) was among the first who placed the probable origin of the coconut on the West Coast of Central America somewhere near the Isthmus of Panama.

The bulk of the botanical evidence in favour of its American origin, had to be abandoned later for the following reasons. The discovery of some new forms of palms of the Cocoineae is South Africa and Madagascar; the existence of the coconut in Africa at the time of its discovery by Vascodo da Gama in 1498 (cited by Child, 1953); the record of cultivation of the
coconut in about 300 B.C in Ceylon and in India in the post-vedic times, the
discovery of fossil cocos in the Pliocene deposits [one to fifteen million years
age] in north Auckland in New Zealand (Hill, 1929) and in the Eocene
deposits (15 to 40 million years ago) in the deserts of Rajasthan in India [Kaul,
1951] very much earlier than the discovery of America.

The west coast of America, as pointed out by Mayuranathan, was dry and not conducive to the growth of the coconut trees. This was proved by the observation of Seemann [1856] who cited several instances of failure of trials in cultivation of this crop in the Panama area. Conceding that it originated there, Mayuranathan found it difficult to explain why it failed to reach the West Indies and the shores of the Caribbean Seas at the time of America, till the Spaniards introduced it on the southern parts of Brazil [Blatter, 1926]. He also failed to understand how coconuts could reach distant places by the Pacific and Indian Oceans considering that the American aborigines had neither the skill nor the need to journey beyond the vicinity of their shores.

Its introduction in America in times later than its record of cultivation elsewhere as pointed out by Mayuranathan was also evident from the lack of native names for the coconut as well as the traditional use of coconut in the ceremonies among the oborigines and settlers of tropical America. Federici [1949] thought that the palm was brought to the west coast of America from Polynesia. This is amply proved from the statement of Jennes [1933] who believed that the coconut plants noticed at the Isthmus of
Panama originated from nuts carried there by Polynesian immigrants in comparatively recent times.

The Polynesian and the other numerous islands of the Pacific have attained at present the highest development in regard to the cultivation of the coconut. Mayuranathan points out that with the Polynesians as well as the islanders of the Pacific, the coconut was not only known ever since these islands came to be inhabited, but had also occupied a higher ceremonial status, being worshipped as one of their Gods. Though established in other lands, he showed how the coconut had attained its highest degree of development in Polynesia. According to him the cult of the coconut was so ingrained in the daily life of the Polynesians that they, like the Malays, had definite names for the nut pertaining to various stages of its growth. According to Rangi Hiora (1932) thirteen names distinguished the stages of development of the coconut from the female flower to the dried seed nut. Brown (1931) enumerated over fifty varieties of coconuts in the Marquesas Islands, where every variety was known under a distinct native binomial, while not more than two names were known in America. All the above facts indicated beyond doubt that the cultivation of the coconut in these islands was of much earlier origin than in America, although assigning its origin to these islands is rather difficult. The geographic history of the formation of these islands, as pointed out by Mayuranathan, showed that these being of coralline of a volvanic nature, represented geographically new lands and for this reason the origin of the coconut be assigned to them.
The above evidence, therefore, helps to rule out the probability of its origin in America or other parts of the new world.

The possibility of its origin in the Old World Tropics may now be considered. Merril (1936) contended that although the place of origin of the coconut is somewhat a mystery, it was undoubtedly a native of some part of the old world tropics. Burkill, Patel (1938) and Mayuranathan pointed out how research workers were all agreed that the home of the coconut was somewhere between Zanzibar and New Caledonia. An examination of the facts in this connection would indicate to which part of this region the home of the coconut could be assigned.

2.2.1.1 The Indian Ocean

The notable areas of the Indian Ocean include tropical Africa, India, Ceylon and the prehistoric area now under the seas in the western part of the Indian Ocean. The claims of these areas may now be considered.

2.2.1.2 Prehistoric area now under the seas

Patel pointed that it was generally recognized that the prehistoric area from Madagascar to the Philippines should have been the home of the coconut. Beccari (1913) and Werth (1938) adduced evidence to assign the origin of the coconut to the submerged lands of the Indian Ocean on South West Asia. Burkills, however, did not agree with this view. The general opinion of other workers also was not in favour of its origin in this area.
2.2.1.3 Tropical Africa

It would appear that none of the workers thought of assigning its origin to Africa. According to Mayuranathan, the Arabs from very early times called it an Indian fruit. Chiovenda (1923), an Italian historian, interpreted certain references in the work of the Arab historians Abu Zaid, Ibn Wahab and Alibiruni as indicating that the original home of the coconut was not far from India. Child (1953) has suggested its possible introduction there by the Arabs who were trading with India, or through sea drift. The biological evidence presented by Lepesme (1947) pointed out that the coconut could never have originated in Africa.

2.2.1.4 Ceylon

The coconut was of ancient origin in Ceylon and its cultivation there was as early as 300 B.C. Coconut was known there by a variety of names, mostly derivative of the names by which it is known in India. Mayuranathan believed that the Singhalese names Pol and Nirali for the coconut were probably derived from the Sanskritic Phala and Narikela respectively, while the names Kotta Pol for the dry coconut and Kurumba for the immature fruit were derived from the Tamil name Kotta Thengai and Kurumai respectively.

According to Patel, a King of Ceylon in the hoary past, seeing the palms flourishing almost in a wild state on the Malabar Coast, is said to have been instrumental in its cultivation there. Mayurnathan cited a Ceylonese legend according to which the coconut is supposed to have been
brought to India from Naga Loka, the blissful region beneath the sea, by an illustrious king for worship, from where it was introduced into Ceylon.

2.2.1.5 India

Considerable historical evidence is available to prove the antiquity of the coconut in India. According to Mayuranathan the coconut in the sixth century described it under its Sanskrit name Cosmos. He also pointed out that John Monte Carvino and Macro Polo in the thirteenth century considered it an Indian fruit. He cited instances of reference to the coconut in post-vedic works, viz., the Mahabharata, the Ramayana, the Vishnu, Matsya, Markhandeya and Brahmanda Puranas. He cited a reference to it in the ancient Tamil work Porunarattupadai and post-vedic works like the Tantras where it had been referred to as a favourite of Lord Shiva. He mentioned instances of worship in India to Varuna, the Lord of the Seas, represented by a pot of water with a coconut placed over it. The offering of the coconut to the seas in worship on the coconut day (Narial Poornami Day) is still a popular event with the inhabitants of the Konkan Coast. Menon (1933) pointed out a popular belief that the coconut represented the Deva Vriksha or the 'Tree of Heaven', brought down by Lord Parasurama for the prosperity of the people of the Malabar Coast. This strip of land is known as Kerala which literally means the land of the coconut.

While its antiquity in India is fairly well established, its origin in India remains disputed for many reasons. Although most of the post-vedic works contain references to the coconut, the Vedas, the oldest work of the Hindus, do not. This indicated later introduction possibly in the post-vedic
period. Apart from this, its possible introduction into India by oceanic currents in the monsoon drift from Malaysia cannot altogether be ruled out. Its later origin in India is supported by the fact pointed out by Bartiett (1927) that among the names of the coconut in Malaya, those of Sanskrit derivation were of a later origin than others already prevalent there. This would indicate that the coconut was introduced into India during the post-vedic period and that in spite of the discovery of fossil cocos species in Rajasthan (Kaul, 1951), India cannot be considered the original home of the coconut. According to geographical history, the Rajasthan desert (Wadia, 1919) was once covered by the sea and it is possible that remnants of trees could have been brought down there by oceanic currents.

2.2.1.6 South-East Asia

These facts leave the claim of the region of South-East Asia comprising Malaysia and Melanesia as the only probable home of the coconut. The former, according to Mollengraph, an eminent Dutch Geologist, comprised the two continental regions and an intermediate group of islands. The first consisted of continental areas of the Asiatic banks which included the Malayan Peninsula, Sumatra, Java, Bali, Borneo and the Paluvian Calmian group of Philippines. The second continental area of the Australian banks includes the Papua (Eastern) New Guinea. The insular group of islands comprised the unstable area between the continental banks consisting of the lesser Sunda Islands, Moluccas, Gilolo, Celebes and all Philippines except the Paluvian Calmian group and had been subjected to great upheavals and depressions from early times, thus excluding the possibility of the origin of the
coconut there. The Melanesian region extended from the equator southwards to the tropic of Capricorn and between 145° and 189° E. longitude roughly extending from New Guinea to the Fiji Islands.

It is in this region that the coconut has attained its highest development. Besides this, as pointed out by Wagner (1924), the equatorial climate of the Malaysian region which was conducive to the growth of the coconut has also been constant through ages. This region according to Merril (1936) formed an important center of the origin of plant and animal life. Biological evidence is also in favour of its origin in this region. Child (1953) cited a close biological association between the coconut and certain animal species like the Robber Crab (Birgus latro). He believed that its association with the crop could be considered as long-standing. The chemical examination of the fat of this crab revealed that it closely resembled coconut oil while it had very little affinity towards animal fat. He advanced a theory that it could reasonably be presumed that when the coconut spread from this original habitat to other areas, it carried with it these crabs and, therefore, a survey of the crab would afford some clues to locate the original home of the coconut. A careful examination of the spread of the crab showed that it extended from the Cocos Keeling Islands as far as the Purdy Islands in the Bismark Archipelago and from the New Hebrides to the Pilynesian Islands of the Pacific in this region. Child also observed that a number of insect species which are specific to the plant could afford clues for locating its place of origin. He was of the opinion that the areas where the number of insect species specific to the coconut are at the maximum could be suspected to be the
place of origin of the plant. He cited results of Lepesme (1947) which indicated that 90 per cent of the insects specific to coconuts were met with in Melanesia, while in Africa and in America, it was only four per cent respectively, which helped to assign the Melanesian region as its probable place of origin.

It is in this region that the coconut was known by the maximum number of names. Heyn (1927) recorded that there are 180 names for the coconut in the Dutch East Indies mostly known by one or more variants of the names, viz., Niyur, Nira, Niog, Nyol and all connected with the coconut prevalent in the region of South-East Asia.

The weight of evidence is, therefore, in favour of the original home of the coconut being located somewhere in South-East Asia. To trace its precise original home further and to localise it appears to be merely speculative, although DeCandolle (1885) traced it to the Dutch East Indies, Vavilov (1935) assigned it to the Malayan region (Siam, Malaya, and Java), Mayuranthan traced it to the North-West of New Guinea and Child considered it of Melanesian origin.

2.2.2 Dispersal of coconut in the World

Having originated at some place in South-East Asia, the coconut would now appear to have moved eastwards towards the Pacific and further into America. Towards the west it moved to India and Madagascar over the calm tropical waters. Although it is often referred to as an ‘ocean-going’ nut (Vanderlock, 1937) due to its capacity to float and to germinate even after floating in sea water for 110 days (Edmondson, 1941) the possibility of its
dispersal through water alone looks altogether improbable. The seednuts in
salt water lost their viability after several days, due to infiltration of salt water
into the husk (Weaver and Clements, 1929). This was confirmed from
observations of Thor Heyerdahl (1952) who found that coconuts packed for
the Kontiki expedition on the raft out of contact with sea water were found
capable of germinating, while nuts stored below the raft were ruined on
exposure to sea water. Therefore, the agency of man must also have been
responsible to a large extent to its introduction and spread. This is significant
from the fact that the Spaniards introduced it into the West Indies and the
southern shores of the Caribbean Sea, the Portuguese introduced it into Bahia
and other parts of Brazil, Polynesian seafarers spread it to the different
Islands of the Pacific, the Arabs disseminated it on the African Coast and
maritime Tamils together with the mariners of the Bengal Coast distributed it
into the lands of the Indian Ocean.

2.3 CLIMATIC REQUIREMENTS

The climatic requirements of the coconut palm is not very
fastidious or exacting in its. In fact, it is highly adaptable to a variety of
environments. But, for ensuring the development of a profitable and
prosperous coconut industry, it is necessary that the likes and dislikes of the
palm are given due consideration, particularly when establishing plantation in
new regions where it was not grown before. The coconut palm derives its
characteristics from the fact that it is essentially a tropical plant. In this
connection, factors such as latitude, altitude, rainfall, temperature, humidity
and sunshine require detailed consideration6.
2.3.1 Latitude

The coconut palm occurs widespread in the tropics. The six primary centres of coconut cultivation, viz., Philippines, India, Indonesia, Ceylon, South Sea Islands and Malaya which together account for over 90 per cent of the world's total acreage and production of the crop lie in this zone between $20^\circ$ N and $20^\circ$ S latitudes. The palm is being grown even beyond this region, as far as $27^\circ$ N and $27^\circ$ S but not on an extensive or commercial scale or with much success. The extreme south at which the coconut is reported as growing is South Dauphin in Madagascar while the northernmost point is in Assam in the north-east corner of India. In Florida (U.S.A), situated at about $25^\circ$ N latitude, attempts at growing the crop on a large scale did not meet with success. In these extreme latitudes the palm is reported to put on good vegetative growth, but not to bear fruits satisfactorily.

2.3.2 Altitude

The limits to altitude up to which coconut can be grown successfully are set by the latitude also. The farther one goes from the equator, the more is the palm confined to lowlands. In India, flourishing coconut plantations are met with in parts of Mysore state situated at elevation of 600 m to 900 m above the sea level. In Ceylon, though the major part of the coconut area is confined to within an altitude of 600 m, palms are under cultivation even at an altitude of 750 m. According to Cooke (1936), the altitude of 600 m appears to be the limit for commercial cultivation in the Philippines. At this elevation the palm has poor and stunted growth, takes a considerably long period to bear, and yields only a few nuts of small size.
Recently, it has been reported that productive coconut plantations have been established at Tabora in Tanganyika (Africa) at an elevation of 1,350 m. The general opinion is that it may be possible to grow the palm at elevation higher than 600 m to 900 m in areas near the equator, where the temperature remains favourable for coconut growth.

2.3.3 Rainfall

Of all the climatic factors affecting the coconut, rainfall and temperature appear to be the more important ones. While temperature conditions may be uniform over comparatively large areas, rainfall can cause considerable variation even within short distances. The coconut palm can grow and bear fruit with a well distributed rainfall of 100 cm but for profitable cultivation, 100 cm to 225 cm per annum, evenly distributed throughout the year, appears necessary. It can stand even much higher precipitation if the soil is well drained. As the tree stores little moisture and has no trap roots, it is not suited for regions with long and pronounced dry spells during which the water table goes down considerably. On the other hand, a water table that is too high and remains stagnant over long periods is definitely harmful to the palm.

In the Philippine Islands the annual rainfall varies from 100 cm to 250 cm and is reported to be spread so evenly throughout the year that there is no dry spell or drought. This is one of the reasons for the very high yields at Zamboanga in the Philippines which receives only about 100 cm of rainfall annually. On the West Coast of India wherein lies the major coconut belt, rainfall increases from the south to the north; but its distribution becomes
less and less favourable. Thus in Travancore, situated in the south, the annual rainfall is 300 cm or less per annum, but the dry period extends to only two or three months in the year, whereas in the South Kanara district, further north, the annual rainfall is about 350 cm, with the dry or rainless period extending to over about five months. This difference in the distribution of rainfall is actually reflected in the general productivity of the crop.

In Ceylon, the annual rainfall varies from as low as 100 cm to as high as 425 cm in different parts of the Island. In Chilaw district, noted for coconut cultivation, the annual rainfall is only 150 cm to 175 cm, but the distribution is so very satisfactory that there are few months during which some rainfall is not received. In Puttalam and Batticaloa Districts where the rainfall is low in quantity and erratic in distribution giving rise to recurrent droughts, growth and yield of the coconut are not satisfactory.

In Indonesia, the rainfall is high in most parts of the Archipelago. It ranges from 700 cm in the west to 200 cm per annum in the east with a corresponding increase in the duration and severity of the dry season.

In the South Sea Islands which form another important centre of coconut cultivation, rainfall is generally satisfactory both in quantity and distribution to permit good growth of the coconut palm.

In Malaya, the average rainfall varies from 212 cm to 250 cm in the interior to about 250 cm in the coastal areas and it is distributed fairly evenly throughout the year.
Under some very favourable conditions, it may be possible to raise the crop successfully even in areas which may not appear to be quite suitable for the crop because of inadequate rainfall. For example, Tiptur and Arsikere in Mysore receive only an annual rainfall of 50 cm to 62 cm, but still good coconut plantations are seen in these areas. The reason is that the coconut gardens are situated in the depressions of rolling lands or adjacent to tanks where water accumulates during rainy seasons and there is a steady supply of soil moisture to the palms through seepage.

It may be stated in a general way that when the total rainfall falls below 100 cm per annum or where the rainfall distribution is very uneven, the coconut can be grown successfully only under irrigation. In parts of Saurashtra and Kutch (India), receiving only 25 cm to 50 cm of rainfall per annum, good coconut gardens have been raised because of the availability of abundant supply of sweet water for irrigation.

The palm cannot stand prolonged drought and therefore adequate soil moisture should be ensured either through well distributed rainfall, percolation water or irrigation. The adverse effect of drought is very pronounced in the coconut plantations of the dry zones. The extent of devastation that can be caused to coconut plantations by successive droughts in areas where the rainfall even in normal years is low and badly distributed can be gauged from the experience of Puttalam District in Ceylon. As a result of an unusual succession of four exceptionally dry years (1947 to 1950) some 300,000 palms were estimated to have died and another 700,000 very adversely affected. It can thus be seen that where rainfall is meager and
chances of its failure great, coconut should be grown only with great care and circumspection.

2.3.4 Temperature

Temperature is another important weather factor that has great influence on the growth and productivity of the palm. The palm requires an equable climate, neither very hot nor very cold. The optimum mean annual temperature for the best growth and maximum yields is stated to be 27°C with a diurnal variation of 6°C to 7°C. Nowhere is the palm grown extensively where the range of temperature is considerable.

On the west Coast of India, the monthly mean of the minimum temperature does not fall below 20°C and the monthly mean maximum rarely goes above 32°C. In Malaya also the temperature is more or less uniform. The maximum temperature is reported to be 30°C to 32°C on the coast and 34°C to 35°C inland. The diurnal range of temperature varies from 6°C to 9°C on the coast to 8°C to 11°C in the interior. A temporary steep fall or rise in temperature, which probably happens occasionally in all places, does no harm. The temperature should not, however, remain at these extremes for long periods at a stretch. High temperatures might cause the young developing inflorescences to dry up, and limit production to those months in the year when the temperature remains at a satisfactory level.

2.3.5 Humidity

The coconut palm, in general, tolerates a climate characterized by warm and humid conditions. On the West Coast of India, the average
monthly humidity recorded at 7.30 a.m. (I.S.T) rarely falls below 70 per cent. According to Copeland (1931), the persistence of highly humid conditions right through is not good for the palm from two angles. One is that it reduces transpiration and the uptake of nutrients. The other is that it provides congenial conditions for the rapid spread of the fatal diseases of the palm, viz., 'bud-rot' and the like. Copeland cites the instance of the coconut country immediately around Mount Banahao where coconut cultivation has been made difficult by the persistence of 'bud-rot' in a severe form under the high humidity conditions which prevail there right through the year. The leaf disease of the coconut palm in Kerala is found to spread rapidly during the rainy months when the atmospheric humidity is high. In Sumatra, too high humidity is reported to cause premature decay of the fruit.

2.3.6 Sunshine

The palm requires plenty of sunlight and does not grow well under shade or in too cloudy regions. The lean and lanky growth and unproductiveness of palms growing in shade and the way they try to turn away from obstruction to expose their crowns to the sun, afford sufficient evidence of the avidity of the palm for sunlight. Copeland (1931) has established from experimental data that cloudiness arrests the rate of transpiration considerably. A light haze has been found to reduce transpiration by one third to one-half and a heavy cloud to one-quarter of what transpires in direct sunlight. Sunlight has also been shown to raise the temperature of the leaf surface and thereby to promote better activity in the tree.
2.3.7 Nearness to sea

The fact that the coconut palm is largely grown in regions bordering the sea coast has often created the mistaken impression that the palm does not thrive in interior land. As already pointed out, good gardens are to be found in the Mysore plateau about 240 km to 320 km away from the sea. Similarly in Ceylon, flourishing coconut gardens are found within the Kandy area situated in the interior.

However, nearness to sea has considerable effect on the climate as well as on the soil. The coastal climate is always more humid and less subject to wide fluctuations of temperature and these conditions are favourable to the palm. In Saurashtra (Bombay), the range of temperature is very wide in the interior (50 C and below, to 430 C and above) while it is equable in the coastal area, the mean monthly maximum rarely going beyond 350 C, and the mean monthly minimum never falling below 140 C. In the coastal areas, the growth of the coconut is excellent while it is comparatively poor in the interior.

Another favourable feature of coastal areas is that they generally possess better sub-soil water supplies than those in the interior, because they have at their back a higher country and the rain which falls there partly sinks into the soil and moves towards the sea bringing with it dissolved nutrients for the palm's nourishment. The ground water near the coasts is also kept in constant movement by the ebb and flow of the tide and this condition is considered suitable for the growth of the palm.
2.3.8 Soil

The crop is grown under extreme conditions of soil which vary from sand to the heaviest clays and on elevations which range from lagoon swampland to hilltops and is found to be exceptionally tolerant to its environment. It should, however, be considered a sea-side palm flourishing in a sea-washed, well-drained coast with constant moving water in the soil and in an atmosphere of saline moisture. John (1952) has described the coconut as essentially a tropical palm thriving well within 23° north and south latitudes and up to an altitude of about 900 m above the sea level. Tempany (1954) believes that the palm grows only in tropical climates and does best on light, easily permeable soils with slowly moving subsoil water at a shallow depth. It can, however, grow well on heavier soils provided they are well drained. There are vast areas of coastal land throughout the tropics which have been and could be used for coconut cultivation (Martyn, 1955).

The coconut palm had been found on all soils irrespective of the parent material from which these soils have originated. Thus it has been found to grow well on white or gravelly sand, alluvial soils, laterite or lateritic soils, peaty or kari soils, volcanic and pumice soils and marine and coral soils.

The best soil for the coconut is rich alluvium or loam with proper soil moisture and drainage which are found in the backwater areas of Travancore-Cochin, Malabar, South Kanara and the Deltaic tracts of the important rivers of India. The coconut also thrives and yields well in lateritic, loamy or black clayey soils on bunds of canals, channels or tanks and on the banks of rivers. It is also found to come up well on sandy soils especially of
the littoral type, provided there is an assured supply of good underground water within easy reach of the roots and the trees are properly manured.

2.3.8.1 Characteristics of coconut soils

John and Menon (1947) state that a major portion of the coconut acreage in India lies in certain well defined zones on the west and east coasts and the tableland of Mysore, more than two thirds of it being in the strip of land between the Western Ghats and the Arabian Sea. Based on the soil, climate and certain other conditions under which coconuts are grown in India, the area can be grouped into the following well defined zones:

i) The coastal sandy tract with fairly high water table (1 metre to 2½ metres) of the West and East Coasts of the Peninsula lying mostly in Kerala, Tamilnadu, Andhra, Orissa and Maharashtra;

ii) The clayed reclaimed areas of the backwaters of Travancore-Cochin and Malabar with high water table (one metre);

iii) The midland or the upland region lying between the coast and hill slopes of South Kanara and Kerala area with sandy soil with low water table (about 6m);

iv) The laterite and loamy soils of hill slopes of the West Coast with varying percentages of gravel and sand with low water table (about 6 m to 9 m);

v) The sandy loam soils of Tanjore with high water table during rains and low water table in summer;
vi) The alluvial deltaic soils of the Godavari;

vii) The loamy soils of Mysore, lying at an elevation of about 600 m to 840 m and with rainfall of 50 cm to 100 cm but with a fairly good supply of subsoil moisture; and

viii) The forest soil of the Anadans and the coral soils of the Laccadives.

2.3.9 Growth

In spite of its wide adaptability to soil and climatic conditions the coconut palm does show certain growth preferences. Anandan et. al. (1950) have cited evidence to show that good growth of the coconut palm and high yields could be obtained only when it is raised under suitable soil conditions. A variety of factors including drainage, soil depth, lay-out of the land as well as soil fertility are indeed involved and have a pronounced influence on the growth of the palm.

Soil texture is a very dominant factor, good coconut soils being of open texture to ensure a very extensive root system and good aeration. Deep alluvial loams and sandy terraces near the coast are particularly suitable. Near the sea, the ebb and flow of the tides produces movements in the subsoil water which appear to be ideal for coconut growth. This movement of water through the soil also takes place when drained low land soils are backed by higher ground as at the foot of hill or mountain slopes.

The land around the base of the mountains or hills whether near the sea or far from it, supports the growth of coconuts fairly well. Thus one of the largest coconut forests in the world is found situated surrounding Mount
Banahao. Copeland (1931) states that in this district with only a few breaks between groves there are more than ten million bearing trees. He also says that the country around the foot of an old volcano is more certain to be suitable than at the foot of mountains of other origin because the effluvium from volcano is usually porous. The water which falls upon it sinks more than the water which falls on ordinary mountains and comes back to the surface well charged with dissolved food from below.

2.4 COCONUT FARMING IN THE WORLD

The principal coconut growing areas of the world lie geographically within about 22° N and S. Outside this limit the palm, generally tend to grow more slowly, is mainly vegetative and has little or no commercial value. Coconut is grown in more than 93 countries of the world. At present, Philippines is the largest producer of coconut in the world. Indonesia occupies the second place and India the third place. Other countries cultivating coconut in the world are Sri Lanka, Africa, America, Thailand, Vietnam, Malaysia and Papua New Guinea.

The main coconut producing areas in the world are shown in Appendix D.

Efforts of research and development made in past years have witnessed significant progress in coconut cultivation all over the world. To recognize its importance September 2nd of every year has been designated as World Coconut Day. It is aimed at creating more awareness on the importance of the coconut and focusing world attention to this crop to enhance its potential in alleviating poverty, encouraging investments in the
sector and promoting total development of the coconut industry in the member countries.

2.4.1 Area and production trend

Statistics on the world acreage and production of coconuts are generally meager, incomplete and of doubtful accuracy. There is no uniform standard for estimating the area and production of the crop. In some countries, the entire area where coconut is grown is reckoned as the area under the crop, disregarding the question of the intensity of the plantation or the fact whether it is largely raised in association with other crops. In other countries the acreage is calculated on the number of trees as the basis. Similarly the production figures are subject to considerable inaccuracies and therefore can be taken only as rough estimates.

An early attempt at estimating the world acreage under coconut was made by Leo Schnurmacher in 1938. Details of country-wise world acreage and production furnished in the study were collected from the publication entitled *Coconut Statistical Year book* brought out by the Asian and Pacific Coconut Community (APCC). It is published in the *Coconut Statistics* by the Coconut Development Board, Kochi, Kerala State.

The world's area, production and productivity of coconut for the year 2004 are presented in Table 2.1.
<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Country</th>
<th>Area (in ‘000 ha)</th>
<th>% share</th>
<th>Production (in million nuts)</th>
<th>% share</th>
<th>Productivity (nuts/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>APCC countries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>F.S.Micronesia</td>
<td>22</td>
<td>0.21</td>
<td>43</td>
<td>0.08</td>
<td>1955</td>
</tr>
<tr>
<td>2</td>
<td>Fiji</td>
<td>57</td>
<td>0.53</td>
<td>152</td>
<td>0.29</td>
<td>2667</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>1,933</td>
<td>18.06</td>
<td>12078</td>
<td>22.86</td>
<td>6248</td>
</tr>
<tr>
<td>4</td>
<td>Indonesia</td>
<td>2960</td>
<td>27.66</td>
<td>14107</td>
<td>26.70</td>
<td>4766</td>
</tr>
<tr>
<td>5</td>
<td>Malaysia</td>
<td>176</td>
<td>1.65</td>
<td>470</td>
<td>0.89</td>
<td>2670</td>
</tr>
<tr>
<td>6</td>
<td>Papua New Guinea</td>
<td>268</td>
<td>2.50</td>
<td>1047</td>
<td>1.98</td>
<td>3907</td>
</tr>
<tr>
<td>7</td>
<td>Philippines</td>
<td>3140</td>
<td>29.34</td>
<td>13256</td>
<td>25.09</td>
<td>4222</td>
</tr>
<tr>
<td>8</td>
<td>Solomon Islands</td>
<td>55</td>
<td>0.51</td>
<td>327</td>
<td>0.62</td>
<td>5946</td>
</tr>
<tr>
<td>9</td>
<td>Sri Lanka</td>
<td>438</td>
<td>4.09</td>
<td>2985</td>
<td>5.65</td>
<td>6815</td>
</tr>
<tr>
<td>10</td>
<td>Thailand</td>
<td>347</td>
<td>3.24</td>
<td>1109</td>
<td>2.10</td>
<td>3196</td>
</tr>
<tr>
<td>11</td>
<td>Vanuatu</td>
<td>90</td>
<td>0.84</td>
<td>318</td>
<td>0.60</td>
<td>3533</td>
</tr>
<tr>
<td>12</td>
<td>Vietnam</td>
<td>171</td>
<td>1.60</td>
<td>1026</td>
<td>1.94</td>
<td>6000</td>
</tr>
<tr>
<td>13</td>
<td>Samoa</td>
<td>84</td>
<td>0.79</td>
<td>180</td>
<td>0.34</td>
<td>2143</td>
</tr>
<tr>
<td>14</td>
<td>Palau</td>
<td>38</td>
<td>0.36</td>
<td>96</td>
<td>0.18</td>
<td>2526</td>
</tr>
<tr>
<td>B</td>
<td>Other countries</td>
<td>922</td>
<td>8.62</td>
<td>5643</td>
<td>10.68</td>
<td>6120</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>10,701</td>
<td>100.00</td>
<td>52837</td>
<td>100.00</td>
<td>4938</td>
</tr>
</tbody>
</table>

Source: Dept. of Economics & Statistics, Govt. of India

The world production of coconut for the year 2004 is estimated at 52,837 million nuts from an area of about 10,701 thousand hectares. The major coconut growing countries in the world are Philippines, Indonesia, India and Sri Lanka.

In the matter of the area under coconut in the world, Philippines is at the top with an area of 3140 thousand hectares. Indonesia stands second with an area of 2960 thousand hectares and India is in the third place.
with an area of 1933 thousand hectares. Sri Lanka (438 thousand hectares) gets the fourth place.

In the matter of production of coconuts, Indonesia stands in the first place, Philippines in the second place, India in the third place and Sri Lanka in the fourth place. The production of the four countries is 14,107; 13,256; 12,078 and 2,985 million nuts respectively.

In the productivity of coconuts among the four countries Sri Lanka tops with 6815 nuts per hectare followed by India with 6248 nuts per hectare. The productivity of Indonesia is only 4766 nuts per hectare while Philippines has the lowest productivity of 4222 nuts per hectare. Table 2.2 shows the share of the major coconut growing countries in the world.

### TABLE 2.2
Position of Major Coconut Growing Countries
2004

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Countries</th>
<th>% share of area</th>
<th>% share of production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Phillippines</td>
<td>29.34</td>
<td>25.09</td>
</tr>
<tr>
<td>2</td>
<td>Indonesia</td>
<td>27.66</td>
<td>26.70</td>
</tr>
<tr>
<td>3</td>
<td>India</td>
<td>18.06</td>
<td>22.86</td>
</tr>
<tr>
<td>4</td>
<td>Sri Lanka</td>
<td>4.09</td>
<td>5.65</td>
</tr>
<tr>
<td>5</td>
<td>Others</td>
<td>20.85</td>
<td>19.70</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Dept. of Economics & Statistics, Govt. of India

In the matter of area, Philippines, Indonesia and India occupy three-fourths of the area (75 per cent). Sri Lanka occupies only 4.09 per cent of the total area of coconut in the world.
In the matter of production also Indonesia, Philippines and India contribute three-fourths of the production (75 percent). Sri Lanka with about 5.65 per cent of the production occupies the fourth position.

The change in area, production and productivity of coconut in the world from 1984 to 2000 is presented in Appendix E.

The area under coconut has increased from 10496 thousand hectares in 1984 to 12782 thousand hectares in the year 2000 and the production of coconuts has also increased from 37059 nuts in 1984 to 54802 nuts. The increase in the area was 21.78 per cent and increase in production was 47.88 per cent. The Compound Growth Rate in the area is 0.95, in production it is 2.12 and in productivity it is 4.64.

2.5 COCONUT FARMING IN INDIA

In India the coconut tree is considered the tree of heaven and its fruit is the fruit of prosperity. Despite its confined distribution, the demand for coconut is spread throughout the country. The high demand for edible and non-edible purpose induces interest in people of even non-traditional belts which inspire them to plant at least two or three saplings in their homesteads.

Coconut is found growing under varying soils and climatic conditions although it is at home in humid tropics with evenly distributed rainfall. Soil moisture conditions, temperature and humidity largely determine the adaptability and productivity of coconut. In areas with poorly distributed rainfall it is grown with supplemented irrigation. Based on soil, physiography, climate and length of growing period, India is broadly divided into twenty
agro-eco regions and sixty eco sub-regions. Except for subtropics and temperature regions coconut is grown in most of the zones which include 19 states and 3 union territories out of the 25 states and 7 union territories. However it is more adapted to the coastal agro-eco-system with a coastline of 8129 km and its peninsular region is bounded by the Arabian Sea on the west, the Bay of Bengal on the east and the Indian Ocean on the south. The district inland eco-systems which grow coconut are the Andaman and Nicobar Islands in the Bay of Bengal and the Lakshadweep Islands in the Arabian Sea. In the last two decades the area of cultivation of coconut has expanded to the humid subtropical and peninsular regions.  

There is a clear difference in the pattern of the distribution in the country. The major portion of the coconut production in the country comes from the Western plains and the Ghat regions comprising the states of Kerala, Karnataka and Maharashtra followed by the Eastern coast plains and hill regions comprising of Andhra Pradesh, Orissa, Tamilnadu and Pondicherry. The Andaman and Nicobar and Laksadweep Islands and the state of Gujarat are the other traditional areas. Certain tracks of Karnataka and Tamilnadu and the states of Assam, Tripura, West Bengal, Bihar and Madya Pradesh are the non-traditional areas where coconut cultivation has made inroads rapidly. In other North Eastern belts like Mizoram, Maipur, Nagaland and Arunachal Pradesh the introduction of the crop is successfully gaining momentum.

2.5.1 Organisational setup of coconut industry

The early years of the twentieth century saw India as one of the leading exporters of copra and coconut oil. With the onset of the First World
War prices of commodities started going up losing the international markets resulting in the erosion of exports and post-war India became an importer of coconut products. The period coinciding with the Second World War also had a dampening effect on the growth of the coconut industry in the country. Sensing the need for revamping the crop situation and desirous to put it back on the rails, the Central Government set up the Indian Central Coconut Committee in 1945 by enacting the Indian Coconut Committee Act of 1944. The Committee was given statutory powers for the systematic development and research aspects of the crop. During the period from 1945 to 1966, the Committee did yeoman service to the growth of the coconut Industry in India.

In 1966 the Committee was abolished and the development of the coconut crop was entrusted to the erstwhile Directorate of Coconut Development, a Central Government organization under the Ministry of Agricultural Research. The functions of the directorate included planning and coordination of programmes pertaining to the development, processing and marketing aspects of the crop in India. The directorate functioned in close liaison with the State Agricultural Departments as well as the Central Government. The Directorate of Coconut Development ceased to exist when the Central Government sanctioned the Coconut Development Board Act of 1979.

The Coconut Development Board is a statutory body established by the Government of India for the integrated development of coconut cultivation and industry in the country with focus on productivity increase and product diversification. The Board which came into service on 12th January,
1981, functions under the administrative control of the Ministry of Agriculture, Government of India, with its headquarters at Kochi in Kerala and Regional offices at Bangalore in Karnataka, Chennai in Tamilnadu and Patna in Bihar. There are eight state centres situated at Coimbatore in Tamilnadu, Bhubaneswar in Orissa, Calcutta in West Bengal, Kondagaon in Madya Pradesh, Guwahati in Assam, Agartala in Tripura, Hyderabad in Andra Pradesh and Port Blair in the Union Territory of Andaman and Nicobar Islands. The main functions of the Coconut Development Board are:

i. Adopting measures for the development of the coconut industry

ii. Recommending measures for improving the marketing of coconut and its products

iii. Providing financial and technical support for the expansion of the area under coconut

iv. Encouraging the adoption of modern technologies for processing of coconut and its products

v. Imparting technical advice to those engaged in coconut cultivation and industry

vi. Adopting measures to get incentive prices for coconut and its products

vii. Recommending measures for regulating imports and exports of coconut and its products

viii. Fixing grades, specifications and standards for coconut and its products
ix. Financing suitable schemes to increase the production of coconut and to improve the quality and yield of coconut

x. Assisting, encouraging, promoting or financing agricultural, technological, industrial or economic research on coconut and its products

xi. Collecting statistics on coconut and its products and publishing them

xii. Undertaking publicity activities and publishing books and periodicals on coconut and its products

2.5.2 Area and production trend in India

The major coconut growing state in India is Kerala, the southern tiniest state lying along the West Coast. Except in Kerala and a few other small states / union territories, coconut does not grow continuously but is limited to only congenial belts accounting for only an insignificant portion of the total agricultural area. Kerala's contribution to the total area is 47.32 per cent. Other major contributing states are Karnataka, Tamilnadu and Andhra Pradesh, the three neighbouring states. The contribution of these states is in the order of 19.32 per cent, 18.07 per cent and 5.50 per cent respectively, thus aggregating the total share of these four major states to 90.21 per cent. The contribution of other states and union territories is only 9.79 per cent. The contribution of the Coconut Development Board to the expansion of the area is widely acknowledged and there is enthusiasm to introduce and expand the crop in non-traditional belts, which have disproved the belief that coconut could only be grown in coastal lands.
Facts relating to the area, production and productivity of coconut in India for the year 2004 - 2005 are furnished in Table 2.3.

**TABLE 2.3**

**Area and Production of Coconut in India 2004-2005**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>State/ Union Territories</th>
<th>Area (in '000 hectare)</th>
<th>% share</th>
<th>Production (Million Nuts)</th>
<th>% share</th>
<th>Productivity (Nuts per hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Andhra Pradesh</td>
<td>104.0</td>
<td>5.37</td>
<td>1199.3</td>
<td>9.35</td>
<td>11532</td>
</tr>
<tr>
<td>2</td>
<td>Assam</td>
<td>21.3</td>
<td>1.10</td>
<td>154.3</td>
<td>1.20</td>
<td>7244</td>
</tr>
<tr>
<td>3</td>
<td>Goa</td>
<td>25.2</td>
<td>1.30</td>
<td>123.5</td>
<td>0.96</td>
<td>4901</td>
</tr>
<tr>
<td>4</td>
<td>Gujarat</td>
<td>16.4</td>
<td>0.85</td>
<td>138.3</td>
<td>1.08</td>
<td>8433</td>
</tr>
<tr>
<td>5</td>
<td>Karnataka</td>
<td>385.4</td>
<td>19.92</td>
<td>1209.6</td>
<td>9.43</td>
<td>3139</td>
</tr>
<tr>
<td>6</td>
<td>Kerala</td>
<td>897.8</td>
<td>46.40</td>
<td>5727.0</td>
<td>44.63</td>
<td>6379</td>
</tr>
<tr>
<td>7</td>
<td>Maharashtra</td>
<td>18.0</td>
<td>0.93</td>
<td>273.4</td>
<td>2.13</td>
<td>15189</td>
</tr>
<tr>
<td>8</td>
<td>Nagaland</td>
<td>0.9</td>
<td>0.05</td>
<td>1.2</td>
<td>0.01</td>
<td>1333</td>
</tr>
<tr>
<td>9</td>
<td>Orissa</td>
<td>50.8</td>
<td>2.63</td>
<td>274.8</td>
<td>2.14</td>
<td>5409</td>
</tr>
<tr>
<td>10</td>
<td>Tamilnadu</td>
<td>357.1</td>
<td>18.45</td>
<td>3243.5</td>
<td>25.27</td>
<td>9083</td>
</tr>
<tr>
<td>11</td>
<td>Tripura</td>
<td>3.3</td>
<td>0.17</td>
<td>7.0</td>
<td>0.06</td>
<td>2121</td>
</tr>
<tr>
<td>12</td>
<td>West Bengal</td>
<td>24.3</td>
<td>1.26</td>
<td>310.9</td>
<td>2.42</td>
<td>12794</td>
</tr>
<tr>
<td>13</td>
<td>A &amp; N Islands</td>
<td>25.6</td>
<td>1.32</td>
<td>87.1</td>
<td>0.68</td>
<td>3402</td>
</tr>
<tr>
<td>14</td>
<td>Lakshadweep</td>
<td>2.7</td>
<td>0.14</td>
<td>53.0</td>
<td>0.41</td>
<td>19630</td>
</tr>
<tr>
<td>15</td>
<td>Pondicherry</td>
<td>2.2</td>
<td>0.11</td>
<td>30.0</td>
<td>0.23</td>
<td>13636</td>
</tr>
<tr>
<td></td>
<td>All India</td>
<td>1935.0</td>
<td>100.00</td>
<td>12832.9</td>
<td>100.00</td>
<td>6632</td>
</tr>
</tbody>
</table>

Source: Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India.

Table 2.3 indicates that coconut is grown in most of the states in the country and about 90.14 per cent of the area and 88.68 per cent production are confined to the four southern states, viz. Kerala, Karnataka, Tamilnadu and Andhra Pradesh.

With regard to productivity Lakshadweep occupies the first place followed by Maharashtra and Pondicherry.
The changes in the area, production and productivity of coconut in India from 1950-1951 to 2004-2005 are furnished in Appendix F. While looking over, it is found that there has been an unprecedented increase in the area, production and productivity of coconut in India in the past 50 years. The area under coconut has increased from 626.5 thousand hectares in 1950-51 to 1935 thousand hectares in 2004-2005 and the production from 3281.7 million nuts to 12832.9 million nuts during the same period. The increase in area is 208.86 per cent and the increase in production is 291.04 per cent. The Compound Growth Rate in area is 2.31, in production 2.52 and in productivity 0.24.

2.5.3 Profile of the export market

The major coconut-based export items from India are coir and coir products. Of late ice cream cups, spoons and forks made of coconut shell, coconut oil in small packs, desiccated coconut, shell-based charcoal and activated carbon, coir pith manure, coconut-cake-based cattle feed and coconut-based handicrafts are also exported to the Middle East and European countries on a limited scale. Table 2.4 shows the export of coconut products from India to various countries.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item</th>
<th>Exported to</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coconuts (fresh)</td>
<td>Bangladesh, Nepal, UAE, Kuwait, Mauritius, Qatar, Netherlands, Bahrain, Saudi Arabia, Germany &amp; UK</td>
</tr>
<tr>
<td>2</td>
<td>Coconuts (dried)</td>
<td>Italy, Oman, Kuwait, Saudi Arabia, Spain, UAE, Iran, Mauritius, UK, USA, Nepal, Canada, Japan, Hongkong &amp; Russia</td>
</tr>
<tr>
<td>3</td>
<td>Copra</td>
<td>Germany, Iran, Oman, Pakistan, UAE, Malaysia &amp; USA</td>
</tr>
<tr>
<td>4</td>
<td>Desiccated coconut</td>
<td>Afghanistan, Argentina, Kuwait, UK, Brazil, Italy, Japan, Spain, Sudan, Oman, Saudi Arabia, Qatar, UAE &amp; USA</td>
</tr>
<tr>
<td>5</td>
<td>Coconut oil</td>
<td>Australia, Bahrain, Bangladesh, Jordan, UAE, Oman, Kenya, Kuwait, Nepal &amp; Saudi Arabia</td>
</tr>
<tr>
<td></td>
<td>a. Crude oil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Refined oil</td>
<td>Bangladesh, Bahrain, Brazil, Italy, Kuwait, Nepal, New Zealand, Oman, Saudi Arabia, USA &amp; UK</td>
</tr>
<tr>
<td>6</td>
<td>Oil cake (defatted)</td>
<td>Malaysia &amp; Nepal</td>
</tr>
<tr>
<td>7</td>
<td>Coconut shell (raw)</td>
<td>Canada, Italy, Japan, Kuwait, Saudi Arabia, Spain, Sri Lanka, Sweden, UK &amp; USA</td>
</tr>
<tr>
<td>8</td>
<td>Shell charcoal</td>
<td>Bhutan, Germany, Oman, Saudi Arabia, Italy, Singapore, Sri Lanka, Kenya, Netherland, Malaysia, Mauritius, Japan, USA, UAE &amp; UK</td>
</tr>
<tr>
<td>9</td>
<td>Shell hukah</td>
<td>Bahrain, Germany, Spain, Sri Lanka, Pakistan, Italy, USA &amp; UAE</td>
</tr>
</tbody>
</table>

The export earning from coconut is mainly from coir and coir products. There has been substantial growth in the export of coir and coir products during the past 5 years in India. A major change that has happened in the Indian coir export arena is the change in the Minimum Export Price Policy. This policy will enable the exporters to get a minimum price for their produce.

The export of coir and products from India in the past five years is shown in Table 2.5

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantity (Tonnes)</th>
<th>Value (Rs. In crores)</th>
<th>Growth rate (in value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2001</td>
<td>67493</td>
<td>313.66</td>
<td>3%</td>
</tr>
<tr>
<td>2001-2002</td>
<td>71335</td>
<td>320.58</td>
<td>2%</td>
</tr>
<tr>
<td>2002-2003</td>
<td>84183</td>
<td>352.71</td>
<td>9%</td>
</tr>
<tr>
<td>2003-2004</td>
<td>102254</td>
<td>407.50</td>
<td>13%</td>
</tr>
<tr>
<td>2004-2005</td>
<td>122927</td>
<td>473.40</td>
<td>14%</td>
</tr>
</tbody>
</table>

Source: Coir Board, Govt. of India.

The export of coir and coir products for the last five years shows an increasing trend in terms of value. The export value for the last financial year reached the highest - ever recorded figure - Rs.473.40 crores.
India has no regular export trade in coconut oil. In India, the domestic demand for oils is more than the supply. The tendency, therefore, is to consume the entire production within the country itself. In the coconut oil export trade, Philippines has the monopoly position controlling 60 per cent.\textsuperscript{12} From India, a small quantity of coconut oil is exported to Bangladesh and Nepal as part of trade agreements. The figures relating to the export of coconut products from 1997-1998 to 2001-2002 are also given in Appendix G.

The export market of coconut in India shows an increasing trend over the past five years from 1997-1998 to 2001-2002. So there is wide scope for improving the export of coconut from India. The Government has to take necessary steps for the improvement of coconut cultivation, maintenance, modernization and to explore the possible opportunities for the betterment of Indian economy.

2.5.4 Import of coconut products into India

India is popular and is known to be one of the biggest producers of coconuts in the world. But it depends upon the import market. Table 2.6 shows the import of coconut products into India from various countries.
TABLE 2.6
Import of Coconut Products into India from Various Countries

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Item</th>
<th>Imported from</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Coconut (dried)</td>
<td>Myanmar &amp; Thailand</td>
</tr>
<tr>
<td>2</td>
<td>Copra</td>
<td>Malaysia, Papua New Guinea, Sri Lanka &amp; Philippines</td>
</tr>
<tr>
<td>3</td>
<td>Desiccated coconut</td>
<td>Sri Lanka, Malaysia &amp; Netherland</td>
</tr>
<tr>
<td>4</td>
<td>Coconut oil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Crude oil</td>
<td>Sri Lanka, Indonesia, Malaysia, Nepal, Singapore &amp; Denmark</td>
</tr>
<tr>
<td></td>
<td>b. Refined oil</td>
<td>Indonesia, Philippines, Malaysia, Singapore &amp; UAE</td>
</tr>
<tr>
<td>5</td>
<td>Oil cake</td>
<td>Sri Lanka, Nepal, Indonesia &amp; Philippines</td>
</tr>
<tr>
<td>6</td>
<td>Shell charcoal</td>
<td>Japan</td>
</tr>
</tbody>
</table>


The import of certain products shows a decreasing trend while a few others still show an increasing trend. The import of coconut oil and oil cake is going on an increasing trend. However, the overall growth rate of the import amount is 460 per cent. So, import is larger than export. Appendix H shows the import of coconut products into India from 1997-1998 to 2001 - 2002.

2.6 COCONUT FARMING IN TAMILNADU

Tamilnadu is situated at the south-eastern extremity of the Indian peninsula bounded on the North by Karnataka and Andhra Pradesh, in the East by the Bay of Bengal, in the South by the Indian Ocean and in the West by the State of Kerala. It has a coastal line of 922 km. It lies between
8°5’ and 13°35’ at the northern latitude and 76°15’ and 80°20’ of the eastern longitude with an area of 1,30,069 sq.km. (50,154.7 sq. miles).

The climate of Tamilnadu is basically tropical. Due to its proximity to the sea, the summer is less hot and the winter is less cold. The maximum daily temperature rarely exceeds 43° C and the minimum temperature does not fall below 18° C. The state is exposed to the both South West and the North East monsoons. It depends on the North East monsoon rains between October and December. The average number of rainy days is 50 per year and the highest rainfall is 106.2 mm in the Nilgiris and the lowest is 45.8 in Ramanathapuram. The annual normal rainfall is 925 mm.

The predominant soils of Tamilnadu are red loam and laterite block, alluvial and saline soils. The total area under forest is 21,072 sq.km of which 17,264 sq.km are reserved forests and 3,808 sq.km are reserved lands. This constitutes only 16.6 per cent of its total geographical area.

Tamilnadu has a good track record of performance in agriculture whose production and productivity have increased manifold. In recent years in Tamilnadu among all crops, coconut as a commercial crop has recorded a very high degree of performance in both area under cultivation and production of nuts.

2.6.1 Area and production trend

Coconut is grown almost in all the 28 districts of Tamilnadu. Among these districts Coimbatore stands first in the area under coconut; Thanjavur gets the second place, Dindigul comes in the third place and Kanniyakumari gets the fourth place. In productivity Thiruvarur ranks first with 16,432 nuts per hectare.
The details relating to the area, production and productivity of coconut in Tamilnadu during the year 2003-2004 are given in Table 2.7.

**TABLE 2.7**

Area and Production of Coconut in Tamilnadu 2003-2004

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Districts</th>
<th>Area (in hectare)</th>
<th>% share</th>
<th>Production (in lakh nuts)</th>
<th>% share</th>
<th>Productivity (nuts per hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kancheepuram</td>
<td>4115</td>
<td>1.17</td>
<td>276</td>
<td>1.08</td>
<td>6701</td>
</tr>
<tr>
<td>2</td>
<td>Thiruvalluver</td>
<td>1093</td>
<td>0.31</td>
<td>68</td>
<td>0.27</td>
<td>6226</td>
</tr>
<tr>
<td>3</td>
<td>Cuddalore</td>
<td>2652</td>
<td>0.75</td>
<td>391</td>
<td>1.53</td>
<td>14742</td>
</tr>
<tr>
<td>4</td>
<td>Villupuram</td>
<td>1933</td>
<td>0.55</td>
<td>106</td>
<td>0.41</td>
<td>5466</td>
</tr>
<tr>
<td>5</td>
<td>Vellore</td>
<td>21805</td>
<td>6.18</td>
<td>1068</td>
<td>4.17</td>
<td>4900</td>
</tr>
<tr>
<td>6</td>
<td>Thiruvanamalai</td>
<td>776</td>
<td>0.22</td>
<td>57</td>
<td>0.22</td>
<td>7386</td>
</tr>
<tr>
<td>7</td>
<td>Salem</td>
<td>11523</td>
<td>3.27</td>
<td>760</td>
<td>2.97</td>
<td>6596</td>
</tr>
<tr>
<td>8</td>
<td>Namakkal</td>
<td>3715</td>
<td>1.05</td>
<td>364</td>
<td>1.42</td>
<td>9788</td>
</tr>
<tr>
<td>9</td>
<td>Dharmapurai</td>
<td>21461</td>
<td>6.08</td>
<td>1099</td>
<td>4.29</td>
<td>5123</td>
</tr>
<tr>
<td>10</td>
<td>Coimbatore</td>
<td>99381</td>
<td>28.18</td>
<td>6902</td>
<td>26.96</td>
<td>6945</td>
</tr>
<tr>
<td>11</td>
<td>Erode</td>
<td>17486</td>
<td>4.96</td>
<td>1019</td>
<td>3.98</td>
<td>5830</td>
</tr>
<tr>
<td>12</td>
<td>Thiruchirappally</td>
<td>5927</td>
<td>1.68</td>
<td>473</td>
<td>1.85</td>
<td>7987</td>
</tr>
<tr>
<td>13</td>
<td>Karur</td>
<td>4487</td>
<td>1.27</td>
<td>278</td>
<td>1.09</td>
<td>6192</td>
</tr>
<tr>
<td>14</td>
<td>Perumbalur</td>
<td>872</td>
<td>0.25</td>
<td>92</td>
<td>0.36</td>
<td>10528</td>
</tr>
<tr>
<td>15</td>
<td>Thanjavur</td>
<td>5199</td>
<td>1.47</td>
<td>421</td>
<td>1.64</td>
<td>8093</td>
</tr>
<tr>
<td>16</td>
<td>Thiruvurur</td>
<td>24240</td>
<td>6.87</td>
<td>2585</td>
<td>10.10</td>
<td>10664</td>
</tr>
<tr>
<td>17</td>
<td>Nagapattinam</td>
<td>4918</td>
<td>1.39</td>
<td>808</td>
<td>3.16</td>
<td>16432</td>
</tr>
<tr>
<td>18</td>
<td>Pudukkottai</td>
<td>3808</td>
<td>1.08</td>
<td>389</td>
<td>1.52</td>
<td>10212</td>
</tr>
<tr>
<td>19</td>
<td>Madurai</td>
<td>10611</td>
<td>3.01</td>
<td>740</td>
<td>2.89</td>
<td>6978</td>
</tr>
<tr>
<td>20</td>
<td>Theni</td>
<td>14466</td>
<td>4.10</td>
<td>1814</td>
<td>7.08</td>
<td>12539</td>
</tr>
<tr>
<td>21</td>
<td>Dindigul</td>
<td>23987</td>
<td>6.80</td>
<td>974</td>
<td>3.80</td>
<td>4060</td>
</tr>
<tr>
<td>22</td>
<td>Ramanathapuram</td>
<td>8343</td>
<td>2.37</td>
<td>457</td>
<td>1.78</td>
<td>5480</td>
</tr>
<tr>
<td>23</td>
<td>Sivaganga</td>
<td>8574</td>
<td>2.43</td>
<td>641</td>
<td>1.50</td>
<td>7480</td>
</tr>
<tr>
<td>24</td>
<td>Virudhunagar</td>
<td>6065</td>
<td>1.72</td>
<td>701</td>
<td>2.74</td>
<td>11552</td>
</tr>
<tr>
<td>25</td>
<td>Tirunelveli</td>
<td>15500</td>
<td>4.40</td>
<td>866</td>
<td>3.38</td>
<td>5588</td>
</tr>
<tr>
<td>26</td>
<td>Thuthukudi</td>
<td>6057</td>
<td>1.72</td>
<td>396</td>
<td>1.55</td>
<td>6537</td>
</tr>
<tr>
<td>27</td>
<td>Nilgiris</td>
<td>52</td>
<td>0.01</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>Kanniyakumari</td>
<td>23664</td>
<td>6.71</td>
<td>1860</td>
<td>7.26</td>
<td>7860</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>352710</strong></td>
<td><strong>100.0</strong></td>
<td><strong>28607</strong></td>
<td><strong>100.0</strong></td>
<td><strong>7260</strong></td>
</tr>
</tbody>
</table>

Source: Department of Economics and Statistics, Chennai.
Facts relating to the changes in area, production and productivity of coconut in Tamilnadu from 1976-1977 to 2003-2004 are presented in Appendix I. The area under coconut has increased from 1,08,903 hectares in 1976-1977 to 3,52,710 hectares in 2003-2004. The production of coconut has increased from 10,949 lakh nuts to 25605 lakh nuts during the same period. The area and production show an increasing trend of 223.87 per cent and 133.86 per cent respectively. But the productivity of coconut comes to a decreasing trend of 27.78 per cent. The Compound Growth Rate of area is 5.28, of production it is 5.11 and of productivity it is 0.38.

2.7 COCONUT FARMING IN KANNIYAKUMARI DISTRICT

Kanniyakumari is the smallest district in Tamilnadu. Even though it is the smallest in terms of area (1672 sq.km.) its density of population is the highest. By its very location the district occupies a unique place amongst the districts of Tamilnadu. It is the land’s end of the Indian peninsula, where waters of the Arabian Sea, the Indian Ocean and the Bay of Bengal embrace one another. It is the only place in the entire world where one can witness both the rising and the setting of the sun. It has a coast line of 68 km stretched on the three sides. This small district is famous for its vast green stretches of paddy fields, coconut groves and luxurious forests and the rare earths of the western sea shore.

The district is surrounded by Tirunelveli district in the north and northeast, by the state of Kerala in the northwest and the confluence of the
Arabian Sea and the Indian Ocean in the west and the south and by the Gulf of Mannar in the east respectively.

The location of this district is 8.3⁰ to 8.35⁰ Northern latitude and 77.05⁰ to 77.36⁰ Eastern longitudes. This district generally has a humid climate. The temperature of this district is minimum 22.1⁰ celsius and maximum 32.8⁰ celsius. It gets rain both from the south West monsoon and also from the North East monsoon. June to September and October to December are the rainy seasons in the district.

Kanniyakumari District is densely populated with 16,69,763 people, and accounts for 2.86 per cent of the total population of Tamilnadu. The density is 957 persons per square kilometre which is the highest in the state. The urban population works out to 17 per cent whereas the rural population is 8.3 per cent. In literacy it stands first in the state with 71.78 per cent.

The district has two revenue divisions, Padmanabhapuram and Nagercoil, with their headquarters at Thuckalai and Nagercoil respectively. There are four Taluks: Agastheeswaram, Kalkulam, Thovalai and Vilavancode. This district has four municipalities - Nagercoil, Padmanabhapuram, Colachel and Kuzhithurai. There are six blocks namely Melpuram, Munchirai, Killiyoor, Thiruvattar, Thuckalay and Kurunthancode which form part of the Padmanabhapuram Development Division and the remaining three Agastheeswaram, Rajakamangalam and Thovalai come under the Nagercoil Development Division. There are 67 town Panchayats in this district whereas there are only 631 town panchayats throughout the state.
The district comprises of seven assembly segments and one parliament constituency and the Kanniyakumari assembly segment forms part of the Thiruchendur Parliamentary constituency.

The district is purely agro based and its economy depends solely on agriculture. It is industrially backward. Based on the topography it can be divided into three - a mountainous terrain, plain lands and undulating valley. In the hilly areas of the Western Ghats plantation crops like rubber, coffee, tea, spices, coconut and tapioca and horticultural crops like mango, pineapple and jack fruits are raised, whereas in the plains paddy, banana, coconut and vegetables are grown.

Paddy is the most important food crop of the district and it is extensively cultivated in an area of 44,000 hectares. Next to paddy, coconut is cultivated on 22,667 hectares and rubber on 21,249 hectares. Tapioca which is the food of the working class is in the fourth rank with 9,337 hectares. Among the commercial crops rubber, coconut and cashew occupy the major areas. Dams, government canals and canal-fed tanks are the major sources of irrigation. Kodayar, Pattanamkal and Neyyar are the main systems of the district.

Kanniyakumari attracts tourists belonging to both Indian States and foreign countries. The Gandhi Mandapam, the Vivekananda Rock Memorial, the Bhagavathi Temple at Kanniyakumari, the Suchindrum Temple, Vattakotai, the Padmanabhapuram Palace with an Architectonical Museum, the Mondaikadu Bagavathy Amman Temple, the Muthalar flume, the St. Xavier Church at Kottar, the Thuckalai Mosque, the Pechiparai and
Perunchani Dams and the Thiruparappu Waterfalls are the major points in the district which attract both inland and foreign tourists. Maruthuvamalai attracts spiritualists seeking solace in solitude. The Kodayar Hydrel Project is a power-generating scheme. It is supplemented by a number of windmills in Aralvoimozhy of this district.

2.7.1 Agricultural activities in Kanniyakumari District

Kanniyakumari District is predominantly an agricultural district. Of its total geophysical area of 1,67,184 hectares, 80,944 hectares are under cultivation. The climatic conditions and the fertility of the soil are very favourable for the cultivation of cash and food crops. The climatic conditions are suitable for dairy farming, goat rearing, poultry farming and duck farming, floriculture, aquaculture, seaweedculture, pisciculture, verniculture, musselculture, algalculture, tissue culture, horticulture and sericulture and the like.

The district falls in the high rainfall zone where both the southwest and the north east monsoons are active. The normal rainfall zone in the district is 1457 mm as compared to the state average of only 943 mm. A major portion of the available land resources is put to use and specifically, plantations dominate the cropping pattern. The district is suitable for almost all types of plantation and horticulture crops.

The Horticulture Department has been undertaking various programmes every year for the development of horticulture. Also it has programmes for improving the productivity of various crops. To develop the schemes under horticulture and plantation, seven farms have been developed
in the district at different places. They are the seed farm at Thirupathisaram, the fruit farm at Kanniyakumari, the pineapple farm at Pechipparai, the pepper farm at Pechipparai and the coconut farms at Puthalam, Parapattu and Manavalakurichi.

The farmers sell their agricultural produce in the Regulated Markets – Eathamozhy, Vadasery, Kaliyakkavilai, Monday Market, Thoduvetty and Kulasekharam. They also sell their produce in the nearest local markets at Mylaudy, Perumalpuram, Friday Market, Karungal, Thuckalay and Marthandam. In addition to these agricultural markets a large number of Mini-markets (Koozhakadai) are spread throughout the district. These regulated markets, local markets and mini-markets ensure a better economic life for the local population and lead to the rural economic upliftment of these regions.\textsuperscript{16}

2.7.2 Major crops

The major crops cultivated in this district are paddy, tapioca, betelwine, blackgram, horsegram, ginger, turmeric, arecanuts, cardamom, clove, pepper and cinnamon. The fruits cultivated throughout the district are cashew, banana, mangoes, jack fruits, pine apple, custard apple, lemon, papaya, guava and blackberry. The important long term cash crops cultivated in this district are coconut, tamarind, cocoa, tea, coffee and rubber. The vegetables cultivated in this district are brinjal, bitter-gourd, pumpkin, snake-gourd, cucumber, luffa, amarphophalus, campanulatus, lady’s finger, green chillies, sweet potato, mint and coriander leaf.\textsuperscript{17}

Table 2.8 shows the area of cultivation and the approximate annual production of major crops in Kanniyakumari District during 2002-2003.
<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Major Crops</th>
<th>Area of Cultivation (Hectares)</th>
<th>Annual Yield (Tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Paddy (Two seasons)</td>
<td>44,000</td>
<td>1,07,300</td>
</tr>
<tr>
<td>2</td>
<td>Coconuts</td>
<td>22,667 (nuts in lakhs) 3382</td>
<td>22,000</td>
</tr>
<tr>
<td>3</td>
<td>Rubber</td>
<td>21,249</td>
<td>22,000</td>
</tr>
<tr>
<td>4</td>
<td>Tapioca</td>
<td>9,337</td>
<td>1,48,000</td>
</tr>
<tr>
<td>5</td>
<td>Blackgram</td>
<td>8,500</td>
<td>280</td>
</tr>
<tr>
<td>6</td>
<td>Banana</td>
<td>3,448</td>
<td>25,000</td>
</tr>
<tr>
<td>7</td>
<td>Cashew apple</td>
<td>2,149</td>
<td>45,000</td>
</tr>
<tr>
<td>8</td>
<td>Cashew nut</td>
<td>2,149</td>
<td>10,000</td>
</tr>
<tr>
<td>9</td>
<td>Tamarind</td>
<td>1,883</td>
<td>500</td>
</tr>
<tr>
<td>10</td>
<td>Mangoes</td>
<td>1,759</td>
<td>35,000</td>
</tr>
<tr>
<td>11</td>
<td>Jackfruits</td>
<td>836</td>
<td>500</td>
</tr>
<tr>
<td>12</td>
<td>Arecanuts</td>
<td>769</td>
<td>37,85,00,00,00</td>
</tr>
<tr>
<td>13</td>
<td>Coconut</td>
<td>630</td>
<td>180</td>
</tr>
<tr>
<td>14</td>
<td>Palmyrah</td>
<td>246</td>
<td>22,000</td>
</tr>
<tr>
<td>15</td>
<td>Vegetables</td>
<td>211</td>
<td>24,000</td>
</tr>
<tr>
<td>16</td>
<td>Betelwine</td>
<td>205</td>
<td>10,000</td>
</tr>
<tr>
<td>17</td>
<td>Spices</td>
<td>140</td>
<td>400</td>
</tr>
<tr>
<td>18</td>
<td>Pepper</td>
<td>74</td>
<td>1,050</td>
</tr>
<tr>
<td>19</td>
<td>Lemon</td>
<td>39</td>
<td>12,000</td>
</tr>
<tr>
<td>20</td>
<td>Pineapple</td>
<td>14</td>
<td>200</td>
</tr>
</tbody>
</table>

Source: Office of the Joint Director, Agriculture Department, Nagercoil.
2.7.3 Coconut-based industries in Kanniyakumari District

The coconut crop supplies raw materials for oil crushing and coir industries. Traditionally oil crushing and coir production were carried on as cottage industries. Oil crushing was carried out in the village settlements of Vaniyars and Checkkalas. They used bullock-drawn country oilchekku. Asaripallam, Colachel, Eethenkadu, Eraniel, Kannamangalam, Manavalakurichi, Perumcode and Pudukkadai were important centres of production of coconut oil as cottage industry. Since 1970 there has been a phenomenal expansion of coconut cultivation, resulting in increased production of copra. Though the mechanized oil chekku has replaced the country oilchekku, the coconut kernel-based industry in this district has not made any headway. Coconut powder manufacturing, oil crushing and tender coconut packing industries have a bright future.

Coconut husks form raw materials for coir and coir-based industries. Coir production has been carried out for long time as a cottage industry. Coir-based industry has growing opportunities on the coastal belt from Manakudi in the east to Kollencode in the west on account of the soaking facilities in backwater canals, lagoons and the like. Coir is supplied for local use and sent to the commercial centres of Karnataka, Kerala, Andhrapradesh, Orissa and Tamilnadu and also exported to foreign countries in the form of mat and mattings.

Thamaraikulam, Pozhikkarai, Ethamozhi, Dharmapuram, Ganapathypuram and Kannakkurichi in Agastheeswram taluk, Manavalakurichi, Parappatu and Colachel in Kalkulam taluk, Painkulum,
Eazhudesam and Kollencode in Vilavancode taluk are thriving centres of coir spinning cottage industry. After 1970 the quantity in the production of coconut husks multiplied and husk processing mills have replaced the hand-beaten husk processing.

In this district, by utilizing the husks about 5,000 metric tonnes of white fibre and 18,000 metric tonnes of brown fibre are produced. The Major portion of the brown fibre is taken to Kerala for the production of various quality coir products for exports. There are 300 registered small scale industrial units engaged in coir defibring.¹⁸

Coir spinning and coir-based industries have witnessed many changes and rapidity of growth. The Kanniyakumari District Central Coir Marketing and Industrial Society Ltd., Eethamozhi, was started on 19th January 1977. This society has 10 affiliated societies spread all over the district.

In the private sector, the TAC-Floor Company, Ammandivilai, a coir-based and coir products manufacturing company, was established in 1975. It is an off-shoot of the reputed Allepuzha Company of Kerala. It is totally a mechanized large scale unit engaged in the production of coir mats, matting carpets and rugs, for local use and mainly for export markets. With the establishment of the TAC-Floor Company, coir based industry has made headway in this district.¹⁹
2.7.4 Area and production trend

Kanniyakumari District is divided into four taluks namely Agastheeswaram, Thovalai, Kalkulam and Vilavancode. The total area, cultivated area and area under coconut farming are presented in Table 2.9.

TABLE 2.9
Area Covered by Four Taluks

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Taluks</th>
<th>Headquarter</th>
<th>Total area (in hectare)</th>
<th>Cultivated area (in hectare)</th>
<th>Area under Coconut farming (in hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agastheeswaram</td>
<td>Nagercoil</td>
<td>27739</td>
<td>17104</td>
<td>7417</td>
</tr>
<tr>
<td>2</td>
<td>Kalkulam</td>
<td>Thuckalay</td>
<td>59363</td>
<td>29794</td>
<td>8985</td>
</tr>
<tr>
<td>3</td>
<td>Thovalai</td>
<td>Boothapand</td>
<td>36907</td>
<td>8972</td>
<td>1305</td>
</tr>
<tr>
<td>4</td>
<td>Vilavancode</td>
<td>Kuzhithurai</td>
<td>43175</td>
<td>25074</td>
<td>4960</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>167184</strong></td>
<td><strong>80944</strong></td>
<td><strong>22667</strong></td>
</tr>
</tbody>
</table>

Source: Department of Statistics, Govt. of India, Nagercoil.

The cultivated area in total area is 48 per cent and the area under coconut cultivation in cultivated area is 28 per cent.

Details of the area, production and productivity of coconuts in Kanniyakumari District relating to the four taluks are given in Table 2.10.
### TABLE 2.10

**Area, Production and Productivity of Coconut in Kanniyakumari District**

2002-2003

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Taluks</th>
<th>Area (in ha)</th>
<th>% share</th>
<th>Production (in lakh nuts)</th>
<th>% share</th>
<th>Productivity (nuts per hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agastheeswaram</td>
<td>7417</td>
<td>32.72</td>
<td>1110</td>
<td>32.82</td>
<td>14965</td>
</tr>
<tr>
<td>2</td>
<td>Kalkulam</td>
<td>8985</td>
<td>39.64</td>
<td>1339</td>
<td>39.59</td>
<td>14903</td>
</tr>
<tr>
<td>3</td>
<td>Thovalai</td>
<td>1305</td>
<td>5.76</td>
<td>191</td>
<td>5.65</td>
<td>14636</td>
</tr>
<tr>
<td>4</td>
<td>Vilavancode</td>
<td>4960</td>
<td>21.88</td>
<td>742</td>
<td>21.94</td>
<td>14960</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>22667</strong></td>
<td><strong>100.00</strong></td>
<td><strong>3382</strong></td>
<td><strong>100.00</strong></td>
<td><strong>14920</strong></td>
</tr>
</tbody>
</table>

Source: Department of Statistics, Govt. of India, Nagercoil.

In Kanniyakumari District, Kalkulam taluk occupies the first position in the area under coconut cultivation (40 per cent). Agastheeswaram taluk gets the second position with 33 per cent, and Vilavancode taluk is in the third place with 22 per cent. Thovalai taluk takes the fourth place in the area under coconut cultivation which is just 6 per cent. But, almost in all areas the productivity is relatively the same.

Details relating to the area, production and productivity of coconut in Kanniyakumari District from the year 1976-1977 to 2000-2001 are presented in Appendix J. Accordingly the growth rate in the area stands at 42.96 per cent, production 219.96 per cent and productivity 123.82 per cent. However the overall performance is good. The Compound Growth Rate in the area is 1.03, production is 4.43 and productivity is 3.36.
2.8 COCONUT PRODUCTS

The coconut plant and its by-product industry on the whole provide employment to about 10 million people in the country.\textsuperscript{20} Each part of the coconut tree is fully utilized. The coconut industry in the country is mainly confined to traditional activities such as copra making, oil extraction, coir manufacture and toddy tapping. Products such as desiccated coconut, shell charcoal, coconut milk are also manufactured.\textsuperscript{21}

2.8.1 Coconut toddy

Toddy tapping is an important rural industry in states like Kerala and Goa. This toddy is a popular intoxicating drink. Some of the products like jaggery, vinegar and fenni are made from coconut toddy.

2.8.2 Coconut leaves

Coconut leaves after drying are used as fuel. Plaited coconut leaves are used as thatching material in rural areas for thatching huts. The leaflets of the spindle leaf are used for decoration and to make head dress in many folk arts. The midribs of the leaflets are used to make brooms of different types which are used for cleaning rough grounds and floors. Plaited coconut leaves are also used for matching baskets, headgears and for erection of temporary fences.

2.8.3 Coconut wood products

Coconut stems are used as supports and pillars in the construction of huts and houses in villages. Coconut wood is used to manufacture furniture, wall panels, doors and windows and show pieces.
American firm has developed the technology for processing coconut wood into floor tiles and panels, which being eco-friendly materials, offer scope for use in western countries.

2.8.4 Copra

The ripe coconuts when dried, whether sun-dried or dried on a fire-place, are known as copra. There are two types of copra: one is edible copra and the other is milling copra.

Edible copra is made in the form of balls and cups. Different grades of edible copra are available in the market according to the size and colour. Edible copra is consumed as dry fruit and used for religious purposes. It is manufactured in Karnataka, Kerala, Tamilnadu, Andhra Pradesh, the Lakshadweep and the Andaman and Nicobar Islands.

Milling copra is manufactured by adopting sun drying and artificial means. A good number of Farmers' Co-operative Societies are also involved in the manufacture and marketing of milling copra. It is available in different grades. They are used to extract oil. Milling copra is produced in Kerala, Lakshadweep, the Andaman and Nicobar Islands, Karnataka, Tamilnadu and Andhra Pradesh.

2.8.5 Tender coconut water

Tender coconut water is a very popular natural drink. It is used as offering in temples and in making ayurvedic preparations. The water of tender coconut, technically the liquid endosperm, is the most nutritious
wholesome beverage that nature has provided for the people of the tropics to fight the sultry heat. It has caloric value of 17.4 per 100 gram.22

"It is unctuous, and sweet; and it increases the semen count, promotes digestion and clears the urinary path", says Ayurveda on tender coconut water. The major chemical constituents of coconut water are sugar and minerals and minor ones are fat and nitrogenous substances.

2.8.6 Coconut shell

Coconut shell is used in the manufacture of activated carbon which is used for declourising in chemical, pharmaceutical, vegetable oil and allied industries. Shell charcoal, shell powder, shell handicrafts, shell ice cream cups and bear glasses, ladles, forks, show pieces, shell buttons are shell-based products available in the country.

2.8.7 Coconut shell charcoal

Shell charcoal is the raw material required for the manufacture of activated carbon. It is manufactured by burning shells of fully matured nuts. In India the average output is 35 kilogram of charcoal from 1000 whole shells; that is, about 30,000 whole shells yield one tonne of charcoal. To obtain good quality charcoal, fully dried, clean, mature shells should be used.

2.8.8 Coir

The manufacture of coir and coir products is the major agro-based cottage industry in the country. Coconut husks form the raw material for coir and coir products and these products earn foreign exchange.
2.8.9 Coir pith

Coir pith is a waste product obtained during the extraction of coir fibre from husk. It is very light, highly compressible and hygroscopic. It is used as a soil conditioner, surface rooting medium and desiccant. Composted coir pith is excellent organic manure for indoor plants as well as for horticulture crops. Several firms manufacture composted coir pith in the country.

2.8.10 Coconut milk

Coconut milk is obtained only by wet processing of coconut. It is used in various food preparations as a substitute to milk. It is available in cans and tetra packs. Spray drying is the best method for the preservation of coconut milk. India has not taken up its manufacture on a commercial scale. Some plants have been set up recently in the country for making coconut milk. Philippines, Malaysia, China, Thailand and Indonesia manufacture concentrated, dehydrated and processed coconut milk.

2.8.11 Coconut oil

Copra is crushed in rotaries or expellers to extract oil. Coconut oil is used as a cooking fat, hair oil, body oil and industrial oil. It is marketed in bulk as well as in packs. The branded coconut oil in small packs is mainly marketed as hair oil and body oil. Refined coconut oil is manufactured for industrial uses and it is mainly used in the manufacture of biscuits, chocolates and other confectionery items, ice cream, pharmaceutical products and costly paints. Filtered coconut oil is used for cooking and toiletry purposes. Oil mills are located in Kerala, Tamilnadu and Karnataka.
2.8.12 Coconut cake

Coconut cake is the residue left after the extraction of oil from copra. It is mainly used as cattle feed. It contains four to five per cent oil, which is extracted by solvent extraction process. This oil is used for industrial purposes and there are a few such solvent extraction units in the country, especially in Kerala.

2.8.13 Desiccated coconut

Desiccated coconut powder is obtained by drying ground or shredded coconut kernel after the removal of brown testa. It finds extensive use in confectioneries, puddings and many other food preparations as a substitute to raw grated coconut. In India the product is manufactured by small scale units scattered over Karnataka, Tamilnadu, Kerala and Andhra Pradesh.

2.9 SUMMARY

Coconut is a benevolent crop, which provides all basic necessities of human life. As edible food, oilseed, beverage and as a source of natural fibre and timber, coconut enjoys a unique status among the plantation crops. Today it is grown in nearly 93 countries in the world. India has recorded excellent growth in production during the last decades. It ranks third in the world.

In Tamilnadu among all crops, coconut as a commercial crop has recorded a very high degree of performance in both area and production
in recent years. Coconut is grown in almost all the 28 districts of Tamilnadu. Kanniyakumari District ranks second in the productivity of coconuts.

Kanniyakumari District is poised for a very bright future in coconut cultivation. Available infrastructure, trained manpower and wide range of climatic conditions in the district are indicative of the best capabilities. At the same time, these resources have to be effectively utilized to the best for making coconut industry more competitive and dynamic. Kanniyakumari District will continue to be the premier producer in Tamilnadu and also assume leadership in the trading of coconuts.
FOOTNOTES


19. Thiruvaranganathan, ibid., pp.81-83.

