CHAPTER III
CHAPTER III

PALM WEALTH IN INDIA

3.1 Introduction

3.2 Palm wealth

3.3 A Palmyrah Palm Tree

3.4 Palmyrah Products

3.5 Palmgur Industry - Key to Rural Economy
CHAPTER – III

PALM WEALTH IN INDIA

3.1 INTRODUCTION

In India, the coconut (Cocos nucifera), palmyrah palm (Borassus flabellifer), Indian sago palm (Caryota urens) and the wild date (Phoenix sylvestris) are the most common palms tapped. Palmyrah (Borassus flabellifer) is the native of tropical Africa. Borassus is a genus of four species and B.flabellifer is the only species found in India. It is found in many dry parts of India, Myanmar, Sri Lanka and Malaysia. The palms grow to a height of about 40 to 60 feet and sometimes as tall as a hundred feet, with a girth of 3.5 to 7 feet. It is one of the palms which produce a sweet sap called neera, or sweet toddy, a nutritious beverage. The sap is being used as a stimulant and antiphlegmatic and for inflammatory affections and dropsy.
One tree gives approximately 0.5 gallon (2.25 litres) neera a day during the season, but it varies from month to month. The yield of neera will be more during winter. As well, there are male and female palms and the latter produces relatively more neera. Male tree produces only two-thirds of a female tree can produce. When a tree is 25 to 30 years old, it is ready for tapping and it will yield for about 30 years. In some places, tapping begins around the 15th year. Every three years, the trees are left to recover.

The palm is described as the “Princess of Vegetables kingdom” in the British Encyclopedia. It is the only palm whose wood is valuable, its roots and fruits are edible and leaves are used for thatching houses, and for making handicraft articles. Annually, a palm can, on average, produce 150 litres of neera, one kg. fibre, 1.5kg. cark and eight leaves. Out of this, one can make 24 kg. jaggery, two baskets, two brush and six mats.

The Nadar (also known as shanars) community of south Tamil Nadu is believed to have migrated from the northern coast of Sri Lanka and entered Tirunelveli in Tamil Nadu through Ramnad. They brought with them the seeds of the Jaffna palmyrah tree. Later, on their arrival in Tamil Nadu, the Pandyan rulers granted them the little over the sandy wastelands which were found to be suitable for the cultivation of palmyrah palms.
Palmyrah industry is mainly labour intensive, the operations being performed by hands with the help of suitable small trade. They do not need either big machines or power for driving machines.

Tapping of neera which is the raw material for the manufacture of edible products viz. jaggery, palm candy, and sugar, extraction of the various like products fibre, leaf, nar, cark and the manufacture of a large variety of artistic articles are the important operations involved in the palmyrah industry.

The manufacture of jaggery and sugar out of palm juice has been a cotton industry in certain parts of India since time immemorial. In the states of Tamil Nadu, West Bengal, Andhra Pradesh and Kerala jaggery was manufactured in the villages even 4000 years ago; long before the advent of sugarcane crushing in sugar mills. History of palm as a sugar-yielding source lies in the unrecorded field of antiquity. But there are records and mention of production of jaggery and palm sugar, since the 13th century with its origin in India only.

In Tamil Nadu the palmyrah, by the utilization of nearly 14 per cent of the palmyrah wealth, provides employment to 2 lakh artisans. Needless to emphasize that, more than 10 lakh workers will be provided with employment if the remaining wealth is fully utilized.

The palmyrah industry is earning valuable foreign exchange. Although jaggery is not exported, the other products of the industry, palmyrah fibre in the
form of artistic articles are exported. Palmyrah fibre has today a great export potential. It is exported to more than 33 countries like Japan, USA, UK, Germany, Belgium and Poland accounting for over 80 per cent and thus contributing over 3 crores of foreign exchange per year.

Palmyrah (Borassus flabellifer L.), a tropical palm, adorns the dry landscape of the semi arid regions of Tamil Nadu, Andhra Pradesh, Orissa, West Bengal, Bihar, Karnataka and Maharashtra. It is a multipurpose tree of great utility and occurs extensively in Tamil Nadu. It is exploited for food from the fruit and tuberous seedlings; beverage and sugar from the sap; fibre from the fruits and leaves for brushes, cordage weaving and plaiting; and trunk wood for construction and fuel. Due to its multifarious uses, the government of Tamil Nadu has declared it as a ‘state tree’.

Palmyrah is a dioecious palm with the great majority of its economic products such as immature endosperm, mesocarp pulp, tuberous seedlings obtained only from female palms. But sweet sap from the inflorescence, toddy, palm sugar, brush fibre and wood are obtained irrespective of whether the palms are male or female. However, differences in their yield or quality have been reported. Thus female palms are supposed to yield more toddy on tapping from the inflorescence and the female tree gives better and hard timber than the male tree, and is also more expensive.
Palmyrah industry is known to be one of the oldest traditional village industries in India. The Khadi and village industries commission classifies palmyrah industries as one of the important village industries in India. The process of industrialization of an under developed and a developing economy like ours, involves the development of not only the basic industries but also the village and cottage industries because of the shortage of capital, technical know-how, inadequate transport facilities and the need for employment opportunities.

The work related to palmyrah trees is done only for six months. The climbing of trees is done three times a day. In a single tree, 6 to 10 vessels are placed. Out of ten litres of neera, three kilos of jaggery is prepared. The trees are mostly taken for lease and the work is done in the study area. One kilogram of jaggery is sold at ₹30 to ₹40. From palmyrah, dry palm leaves, palm roots, palm candy are obtained. By tapping neers, different edible products are produced—jaggery, palm candy, sugar. By products like fibre, leaf, nar cark and the manufacture of artistic articles are also produced. The neera is sold through cooperative societies only. Out of 10 litres of neera, 2kg of jaggery is got.

The first product from palmyrah is candy and then, after adding calcium carbonate, neera is produced. People say that candy is food for health. But government does not allow people to extract and use candy. So the profit in this area is restricted. This work related to palmyrah is a risky and dangerous one and so people are not interested in doing this work.
Every day the workers should climb every tree three times. If the times are reduced to two, there is no use of the particular tree. Heavy wind also will disturb the collection of neera in the pots of the trees. Even the rain will affect the neera very much. There is a cry for support from the government to permit the extraction of candy which is food for health for all ages. There is also a question, when the foreign imported alcoholic drinks are fully permitted in the economy, why not the government permits the candy extraction and its sales.

The work of a tapper starts in the morning with the climbing of trees for tapping neera, bringing the neera from different places to the house, boiling it to convert it into jaggery. Not only the tapper but also the whole members of the family have to engage in this occupation. The palmyrah tappers and their family are backward in education. Proper and alternative employment is not available to the palmyrah tappers in the off-season. They cannot meet even their basic requirements of food, clothing and shelter because of their low income. Most of them lived in thatched huts without proper sanitary, lighting and drinking water facilities.

In the Bible, there is a simple but beautiful parable of a seed. The seed falls to the ground, covered by the dust, then sprouts and stretches forth its branches to given shelter to many birds. In the same way, one can say that here is the parable of the palmyrah nut, despised, disregarded, discarded and thrown into the dust, only to sprout as a hardy and formidable palmyrah palm that will shelter the downtrodden of our society.
Neera can be converted into jaggery, sweet as honey itself. This jaggery is superior to cane jaggery. Cane jaggery is sweet but palm jaggery is sweet and delicious. Palmgur gives mineral salt too. Where there are the way of banishing poverty from our land; this is an antidote to poverty. - Mahathma Gandhi

The family of palm constitutes nearly 1,100 species, widely scattered over the world with their concentration in tropical countries. However only 9 species yield sweet juice known as Neera, the basic raw material for the manufacture of jaggery, sugar and candy besides its direct consumption as a health beverage.

3.2 PALM WEALTH

India is one of the countries blessed with rich growth of palms. In India, palmyrah trees are grown in the states of Tamil Nadu, Andhra pradesh, West Bengal, Kerala and Mysore. They are widely planted in the district of Coimbatore, Kanyakumari, Tirunelveli, Thoothukudi, Thiruchirapalli and Ramanathapuram in Tamil Nadu. The khadi and village industries commission classified palmyrah industry as one of the important village industries in India. Palmyrah juice is not only a good liquid food but is an excellent food for typhoid both at an early as well advanced stages. Jaggery contains chemicals like calcium and phosphorous which is good for health.

Palms produced a sweet sap, neera in abundance. People turned to these palms in hope of making a living, since their options were limited in the absence of suitable employment avenues. Jaggery is used as sugar. However it did not bring
sweetness to the lives of the tappers. Instead, the tappers and their families experienced misery and sorrow. Children were laboured with their parents for their daily bread. Schools were out of the reach of boys and girls. Boiling neera required not only the labour of the tappers, but the entire family.\(^5\)

Palmyrah palm tree is a tall and swaying tree well known as “Borassus Flabellifer”. The word ‘Borassus’ was derived from a Greek word and it means the leathery covering of the fruit and ‘Flabellifer’ means fan-bearer. This tree bears a lot of names in various languages in India. For instance, in Hindi and Bengali, the tree is called as Tal, Talgachh and Tarkajhar. It is known as Pannei in Tamil language. In Telugu, it is called as Lulu or Tati and in Malayalam this tree is named as karimpana. In English, the tree has some other names except the palmyrah palm tree and these names are the Fan palm, Brab Tree, Toddy palm and Tala Palm. This tree is found in the drier areas of India, Sri Lanka, and Burma and also in most of the tropical countries.

Borassus Flabellifer, also known as the Asian palmyrah palm, toddy palm, sugar palm, or cambodian palm, is robust and can live 100 years and more and reach a height of 30 m, with a canopy of leaves several dozen fronds spreading 3 meters across. The large trunk resembles that of the coconut tree and is ringed with leaf scars. Young palmyrah palms grow slowly in the beginning but then grow faster. Its growth pattern, large size, and clean habits make it an attractive landscape species. Palmyrah a tropical palm, adorns the dry landscape of the semi arid regions of Tamil
Nadu, Andhra Pradesh, Orissa, West Bengal, Bihar, Karnataka and Maharashtra. The palmyrah tree is the official tree of Tamil Nadu. Highly respected in Tamil Culture, it is called “Karpaga” (“celestial tree”) because all its parts without exception have a use.

3.3 A PALMYRAH PALM TREE

The palmyrah palm is a large tree up to 30m high and the trunk may have a circumference of 1.7m at the base. There may be 25-40 fresh leaves. They are leathery, gray green, fan-shaped, 1-3 m wide, folded along the midrib, and are divided to the center into 60-80 linear - lanceolate, 0.6-1.2 m long, marginally spiny segments. Their strong, grooved petioles, 1-1.2 m long back - margined when young, are edged with hard spines. It grows wild from the Persian Gulf to the Cambodian Vietnamese border is commonly cultivated in India, Southeast Asia, Malaysia and occasionally in other warm regions including Hawaii and Southern Florida. In India, it is also used as a natural shelter by birds, bats and wild animals. Palmyrah is a palm with a great majority of its economic products such as immature endosperm, mesocarp pulp, tuberous seedlings obtained only from female palms.

3.3.1 Cultivation

a. Palmyrah is generally propagated by direct sowing at the time of monsoon.

b. Palmyrah thrives well in arid zones and it is a tree of sub-tropical region.
c. Palms, unlike broad leaved woody trees, complete stem caliper growth before beginning substantial height increase.

d. Palms have been cultivated in Hungary as in most central European countries since the baroque period.

e. Palmyrah palms are found in abundance in the peninsula. In some places they grow wild and in others they are cultivated.

3.3.2 Climate and soil

Palmyrah thrives well in arid zones and it is a tree of sub-tropical region. Though it grows well in sandy plains, it is suited to red, black soils and river alluvium. The palm is fit to arid regions with annual rainfall of less than 750 mm. However, it also flourishes well in wet conditions and it does not suffer from flooding. It can come up at elevations up to 800 m. Since, the palm has deep and extensive root system it contains soil erosion and prevents shifting of sand dunes. It is commonly used on and field bunds to strengthen. The tree also serves as fire-breaker in Savanna where wild fires are common.

3.3.3 Sowing

A spacing of 3 m x 3 m is adopted to establish plantations accommodating 1110 palms. Pits are formed to a size of 30 x 30 x 60 cm³. The pit is filled half with a mixture of 10 kg farmyard manure and field soil. The seednut is positioned at 5 cm deep in the pit with its narrow conical end facing down or sidewise. To prevent the
damage by termites. 100 gm of Malathion 4 percentage dust is sprinkled around the nut and covered with soil. Since, the germination of seed nuts is normally 60-65 percentages, gap filling is essential in the subsequent year when fruits become available.

3.3.4 Watering

Since, planting coincides with monsoon, watering is not required during that period. However, if there is a failure of rain, pot watering immediately after planting and at alternate days has to be done up to a month. For uniform establishment, watering at weekly intervals is essential during non-rainy periods for one year. To increase neera and fruit yield in grown-up palms pitcher irrigation is recommended twice a month during the tapping season.

3.3.5 Ploughing

The interspace between palms has to be ploughed before monsoon and the basin is to be rectified to a radius of 45 cm around young seedling to facilitate water harvest. It is essential that the basin has to be widened to 2 m for older palms. Leaves should not be cut from trees. When they reach a height of 2 m, few leaves can be removed. Defoliation up to 50 percentage, leaving 16-22 leaves is recommended in adult palms. Normally, senesced leaves and butts are removed and tree cleaning is done once a year before tapping.
3.3.6 Intercropping

During rainy season groundnut, cowpea and green gram are grown as intercrops. Fruit trees such as custard apple and West Indian cherry can also be planted as intercrops.

3.3.7 Crop protection

Palmyrah suffers as coconut, due to the infestation of Orycles rhinoceros (rhinoceros beetle), Rhynchophorus ferrugineus (red palm weevil) and Opisina arenosella (leaf-eating caterpillar). These insects can be effectively managed by adopting the control measures recommended for coconut. Unlike coconut, palmyrah does not suffer due to diseases. Though bud rot caused by Phytophthora palmivora was a constraint in palmyrah during the earlier periods of twentieth century, the disease was effectively eradicated. Few minor foliar diseases caused by Pestalolbio palmarum, Stigmina palmjvora and Gvaphiola borassi can be controlled by foliar application of copper oxychloride.

3.3.8 Yield

If the palm is properly taken care of, it starts flowering at 10 to 12 years. Though flowering is seasonal, it varies in Tamil Nadu among tracts from March-April to October-November. In Kerala, the tree flowers in August-September. A mud pot coated with slaked lime is tied to the spadix for collecting the sap. In a tapping duration ranging from 3 to 4 months, a palm yields 100 to 200 litres of neera commencing from 12 to 15 years of age. Female palms if left untapped, can bear 70
to 200 fruits. Intensive cultivation once followed will pave the way for extensive cultivation, bringing large areas of wastelands under this productive palm.

### 3.3.9 Multipurpose Palmyrah Palm

Palmyrah palm tree has numerous uses. Almost every part of the tree has some kind of utility. In the young age, the wood of the tree is soft and it slowly hardens. The tree has some religious values as well. They use the leaves and fruits on their ceremonial occasions by hanging them on doorways and also they use them on marriage shamianas. It can be said that, the palmyrah palm tree also provide inestimable value to the people of the country.

### 3.3.10 Seedlings

The peeled seedlings are eaten fresh or sun-dried, raw, or cooked in various ways. They also yield starch, which is locally made into gruel, with rice, herbs, chilli peppers, fish, or other ingredients added. It has been proposed for commercial starch production. Small fruits are pickled in vinegar. In April and May in India, the shell of the seed can be punctured with a finger and the sweetish liquid sucked out for refreshment like coconut water. Immature seeds are often sold in the markets. The kernels of such young seeds are obtained breaking them open. The half-grown, soft shelled seeds for the hollow jelly-like kernels are sliced longitudinally to form attractive loops, or rings and these, as well as the whole kernels, are canned in clear, mildly sweetened water, and exported. Tender fruits that fall prematurely are feed to cattle. The pulp of mature fruits is sucked directly from
the wiry fibers of roasted, peeled fruits. It is also extracted to prepare a product called punatoo in Ceylon. It is eaten alone or with the starch from the palmyrah seedlings. The fresh pulp is reportedly rich in vitamins A and C.

3.3.11 Trunk

The stalks are used to make fences and also produce a strong, wiry fiber suitable for cordage and brushes. The black timber is hard, heavy, and durable and is highly valued for construction. And also, the young plants are cooked as a vegetable or roasted and pounded to make meal. People generally, use the hard outer wood to posts, beams and for domestic purposes. The vacant stem of the palmyrah palm tree is considered as best for making water pipes.

3.3.12 Crown

When the crown of the tree is removed, the segment from which the leaves grow out is an edible cake. This is called pananchoru in Tamil.

3.3.13 Sprouts

States of Andhra Pradesh and Tamil Nadu, India, and in Jaffna, Sri Lanka, the seeds are planted and made to germinate and the fleshy stems (below the surface) are boiled and eaten. It is very fibrous and nutritious, known as “Panai Kizhangu” or “Panamkizhangu” in Tamil and “Thegalu” in Telugu. The germinated seeds hard shell is also cut open to take out the crunchy kernel, which tastes like sweet water chestnut. It is called “Dhavanai” in Tamil.
3.3.14 Leaves (Tala Patralu)

The leaves of the tree itself have a large number of uses. Palmyra palms were used in ancient India to write on, as a kind of papyrus. Leaves of suitable size and shape and texture, with sufficient maturity are chosen. The leaves are then seasoned by boiling in salt water with turmeric powder. This acts as a preservative. The leaves are then dried. When they are dry enough, the faces of the leaves are polished with pumice stone. Then they are cut in the proper size. A hole is cut in one corner. Each leaf will have four pages. The writing is done with a stylus. The writing is very cursive and interconnected style. The leaves are then tied up as sheaves. The leaves are used for thatching, mats, baskets, sandals, fans, hats, umbrellas, and as writing material. Moreover, the midribs of the leaves and the fibers from their stalks has the ability to be used in making brushes and people use the net-like material at the base of the young leaf for making into torches as well.

3.3.15 Fruits

People also enjoy eating the jelly like pulp of the fruit and the soft kernels of young fruit very much. The developed nuts and their enlarged, fleshy embryos are also cooked and eaten as vegetables.

3.3.16 Medicinal uses

There are innumerable medicinal uses for all parts of the palmyrah palm. The young plant is said to relieve biliousness, dysentery, and gonorrhea. Young roots are
diuretic and anthelmintic, and a decoction is given in certain respiratory diseases. The ash of the spadix is taken to relieve heartburn and enlarged spleen and liver and the fruit is popular as aperients. The bark decoction, with salt, is used as a mouth wash, and charcoal made of the bark serves as a dentifrice. Sap from the flower stalk is prized as a tonic, diuretic, stimulant, laxative and anti phlegmatic and amebicide. Sugar made from this sap is said to counteract poisoning, and it is prescribed in liver disorders. Candied, it is a remedy for coughs and various pulmonary complaints. The pulp of the mature fruit relieves dermatitis.

3.4 PALMYRAH PRODUCTS

3.4.1 Toddy

The chief product of the palmyrah is the sweet sap (toddy) obtained by tapping the tip of the inflorescence, as is done with the other sugar palms and, to a lesser extent, with the coconut. Fresh toddy, heated to promote fermentation, is bandaged on all kinds of ulcers. If the fresh toddy is mixed with rice flour and gently heated until it ferments, it makes a precious stimulant poultice. The toddy ferments naturally within a few hours after sunrise and is locally popular as a beverage; it is distilled to produce the alcoholic liquor called palm wine, arrack, or arak. Rubbing the inside of the toddy collecting receptacle with lime pastes prevents fermentation, and thereafter, the sap is referred to as sweet toddy, which yields concentrated or crude sugar (gur in India; jaggery in Ceylon); molasses, palm candy and vinegar.
Palmyrah palm jaggery (gur) is much more nutritious than crude cane sugar, containing 1.04 percentage protein, 0.19 percentage fat, 76.86 percentage sucrose, 1.66 percentage glucose, 3.15 percentage total minerals, 0.816 percentage calcium and 0.052 percentage phosphorus the fresh sap is reportedly a good source of vitamin B complex. Since 1986, Scientific education development for communing development (SEDCO) at Satbankam in Thoothukudi District, is engaged in conservation and development activities of natural resources. Estimation of palm wealth in India, as done by the Khadi and Village Industries, shows that, there were 102 million palms in 1986, of which 69 million were tappable. But, only 12.3 million (12.06 percentage) palms were made use of for tapping purpose. Palmyrah (Borassus Flabellifer) is the native of tropical Africa. Borassus is a genus of four species and found in India. It is found in many dry parts of India, Myanmar, Sri Lanka and Malaysia. The palms grow to a height of about 40 to 60 feet, and
sometimes as tall as a hundred feet, with a girth of 3.5 to 7 feet. It is one of the palms which produce a sweet sap called neera, or sweet toddy a nutritious beverage. (Other sap producing palms include Caryota urens, Cocos nucifera, Nipa fruticans and Phoenix sylvestris). The sap is being used as a stimulant and antiphlegmatice and for inflammatory affections and dropsy.

One tree gives approximately 0.5 gallon (2.25 litres) neera a day during the season, but it varies from month to month. A particular season and its duration varies from place to place within the same state. The yield of neera will be more during winter. As well, there are male and female palms and the later produces relatively more neera. Male tree produces only two-thirds of a female tree can produce. When a tree is 25 to 30 years old, it is ready for tapping and it will yield for about 30 years. In some places, tapping begins around the 15th year. Every three years, the trees are left to recover. It is the Kalpa tree, the Hindu tree of life, and one among the five trees of the Hindu paradise that is used for tapping. The Tamil poet Arunachalam speaks of 801 uses of Palmyrah. Palmgur (Karupetty) palm candy (Panam Kalkkandu) are other major products made from neera. The Tamil proverb is that the tree lives a thousand years and it lasts another thousand years which it dies. It is the only palm whose wood is valuable, its roots and fruits are edible and leaves are used for thatching houses, and for making handicraft articles. Annually, a palm can, on average produce 150 litres of neera, one kg. fibre 1.5 kg. eark and eight leaves. Out of this, one can make 24 kg. gur, two baskets, two brush and six mats.
TABLE 3.2

NUTRITIVE VALUE PALM GUR

<table>
<thead>
<tr>
<th></th>
<th>Nutrient</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thiamine (Vit. B)</td>
<td>21 mgm</td>
</tr>
<tr>
<td>2</td>
<td>Riboflavin (Vit. B)</td>
<td>432 mgm</td>
</tr>
<tr>
<td>3</td>
<td>Nicotinic Acid (Antipallagra Vitamin)</td>
<td>5.24 mgm</td>
</tr>
<tr>
<td>4</td>
<td>Ascorbic Acid (Vit. C)</td>
<td>11 mgm</td>
</tr>
</tbody>
</table>

Source: Wealth from the Palms

Like climbing the palm, tapping, too, is a hard job. In male trees, the flowering shoots are bruised using wooden sticks called Kadippu. Once it is bruised, two or three days later in the evening, it is scraped and the tips are pared off with the tapping knife (katthi). Throughout the night, neera will be collected drop by drop into a small earthen pot tied to the stalk. In the case of female palms, the inflorescence is cut when the nuts are very small, but only the tips are squeezed, beaten and pared off. Palmyrah juice is a good liquid food. Though climbing is not liked by all people, the demand for palmyrah juice and the final product called jaggery is universal. It is very useful and is part of the regular diet of a considerable number of people. The nutritive values of palmgur are given below based on an analysis (out of 100Gms) of the Nutritional Research Laboratories, Indian Council of Medical Research.
### TABLE 3.3

**COMPOSITION OF PALM GUR**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Moisture</td>
<td>8.61</td>
</tr>
<tr>
<td>2.</td>
<td>Sucrose</td>
<td>76.86</td>
</tr>
<tr>
<td>3.</td>
<td>Reducing Sugar</td>
<td>1.48</td>
</tr>
<tr>
<td>4.</td>
<td>Fats</td>
<td>0.19</td>
</tr>
<tr>
<td>5.</td>
<td>Proteins</td>
<td>1.04</td>
</tr>
<tr>
<td>6.</td>
<td>Total minerals</td>
<td>3.15</td>
</tr>
<tr>
<td>7.</td>
<td>Calcium as CaO</td>
<td>0.86</td>
</tr>
<tr>
<td>8.</td>
<td>Phosphorus as P2O5</td>
<td>0.052</td>
</tr>
</tbody>
</table>

Source: Primary data

### TABLE 3.4

**COST STRUCTURE OF PALM GUR**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tree rent</td>
<td>15</td>
</tr>
<tr>
<td>2.</td>
<td>Fuel</td>
<td>11</td>
</tr>
<tr>
<td>3.</td>
<td>Chemicals</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>Depreciation</td>
<td>7</td>
</tr>
<tr>
<td>5.</td>
<td>Overheads</td>
<td>4</td>
</tr>
<tr>
<td>6.</td>
<td>Earnings</td>
<td>61</td>
</tr>
</tbody>
</table>

Source: Wealth from the Palms, p. 17.
Jaggery has long been known in India. The liquor extracted from the palmyrah tree is converted into a black rock of sugar called jaggery. Jaggery contains chemicals like calcium and phosphorus. Jaggery is generally prepared and consumed in the states of Tamil Nadu, Andhra Pradesh, Bengal, Mysore and Kerala. Kerala tops in the list of maximum consumption of jaggery.

3.4.2 Palm Candy and Sugar

Palm candy, panam kalkkandu in local parlance, is a crystalline form of sucrose contained in neera. Neera is first heated to 40⁰ - 60⁰C in order to remove its impurities. It is then delimed to bring the pH around 8, and filtered to remove the sediments. Again, it is boiled up to 108⁰C when it turns into a syrup form. This syrup is then transferred to a specially mode container, crystallizer, and kept intact for 41 days. During this period, the syrup undergoes a process of crystallization and pearl-like candy crystals grow in the crystallizer. The remaining molasses in the crystallizer is again boiled at 108⁰C to repeat the same process. The crystals can be harvested on the 41st day. They are to be washed and dried in the sun before packing. On the basis of the color and size, candy is graded into five categories of export quality, Parumani, Salankai, Saral and Podisaral.
TABLE 3.5

NUTRITIONAL ANALYSIS OF PALM CANDIES

<table>
<thead>
<tr>
<th>Nutritional value</th>
<th>Palmyrah Neera</th>
<th>Palmyrah Sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture %</td>
<td>0.7</td>
<td>0.06</td>
</tr>
<tr>
<td>Protein %</td>
<td>0.2</td>
<td>0.06</td>
</tr>
<tr>
<td>Fat. 0.04% (Ether extracts.)</td>
<td>0.04</td>
<td>0.07</td>
</tr>
<tr>
<td>Minerals</td>
<td>0.3</td>
<td>0.06</td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>98.76</td>
<td>99.76</td>
</tr>
<tr>
<td>Calcium (Ca) mg. %</td>
<td>58.7</td>
<td>18.9</td>
</tr>
<tr>
<td>Phosphorus (P) mg. %</td>
<td>5.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Iron (Fe) mg. %</td>
<td>1.4</td>
<td>5.2</td>
</tr>
<tr>
<td>Caloric Value for 100 gms.</td>
<td>396</td>
<td>400</td>
</tr>
<tr>
<td>Riboflavin mg/100 gm.</td>
<td>8.2</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Source: Nutritional Research Laboratories Indian Council of Medical Research

Palm candy is manufactured from boiled neera. It is widely used for medicinal purposes as well as for other domestic uses. Making palm candy is a traditional art of Tamil Nadu. A training centre has been started (at Tiruchendur, Tuticorin District) by the State Federation to provide training in the manufacture of palm candy by using improved techniques. As the neera in Tiruchendur area contains more sucrose than elsewhere, the centre is efficiently run at Tiruchendur with an annual production of one ton of candy. The Nutrition Research Laboratories, Indian
Council of Medical Research, Coonoor (Madras State) has analyzed a sample of palmyrah jaggery.

### 3.4.3 Fibre

It is one of the important by-products of the industry extracting fibre from the palmyrah tree. During the months of April, May and June the artisans engage in fibre making. A variety of articles like brushes, foot rugs and mats are manufactured out of fibre. The Tamil Nadu State Palmgur Federation has an export wing at Colachel with branches at Tuticorin dealing with fibre export trade. Palmyrah fibre has today great export potential and earning about two crores in foreign exchange annually.

### 3.4.4 Palmyrah Leaf Eark and Naar

A variety of fancy and utility articles can be made from palmyrah leaf and its mid rib called eark. Articles like fans, bags, mats, wall mats and many other decorative articles are made out of leaves. Artistic and beautifully made palmyrah leaf articles are in great demand both in our country and abroad. A unit was started by the Tamil Nadu state Palmgur Co-operative Federation in 1974 at Meignanapuram in Thoothukudi District. Nearly 125 persons are employed of which 50 have studied upto S.S.L.C. They are trained in the manufacture of leaf articles like fans, garlands, tablemats etc. Also, a palm leaf Co-operative Industrial Society functioning at Manapad is helping the fisher-women to utilize their spare
time profitably and supplement their income. The goods are exported mainly to London. The word 'naar' originated from Tamil language. Outer and inner skins of the petiole are known as agani and putani respectively. It is used for making baskets of different shapes, mats, cots, and chairs. Even the waste fibrous material is coloured and made into mats. It is carried out as a house-hold industry in Tamil Nadu.

3.4.5 Palm Sugar

This dense textured, full flavoured sugar is tapped from palm trees across tropical South East Asia in the same manner as maple syrup has been tapped for thousands of years. The palms produce the sweet sap once they have commenced flowering and this can take up to 15 years or more. The agile harvesters have to shimmy up the palm trees to a height of 15 to 25 metres and soften the trunk by banging it for several days with a mallet. The tree is then tapped and a receptacle is left to catch the sap, which is known as sweet toddy, giving the harvesters the name toddy tappers. A good tapper can collect up to 400 litres a day during the dry season. They work seven days a week and climb each tree twice a day. Several different species of palms are used for gathering sweet toddy, including the kitul palm Caryota urens, the coconut palm Cocos nucifera and the palmyra palm Borassus flabellifer, but the most prized is the sap of the kitul palm.

The sap must be boiled within a few hours to make the palm sugar otherwise it will promptly ferment into potent sly grog. The country where the palm sugar is
being made determines the length of time that the sap is boiled down. In Thailand the desired result is somewhat lighter in colour and texture and is packaged in glass jars so the sugar can be spooned out. It has the texture of a semi-solid liquid glucose and is pale to deep gold in colour. In other countries such as India, Burma, Malaysia and Indonesia the sap is boiled down further, then poured into mould and left to set into a solid block of dense, dark brown sugar.

This form of palm sugar is known as gur in India, jaggery in Sri Lanka and Burma, gula melaka in Malaysia and gula jawa in Indonesia. It is sold in several shapes, generally cylinders and round cakes depending on whether bamboo or coconut shells were used as a mould. It must be chipped or grated before adding to a recipe. Unlike western uses for sugar, in countries where palm sugar is produced it is added to many savoury dishes as well as sweet ones. Most coconut based Thai curries have the twin seasoning of fish sauce and palm sugar towards the end of cooking to round out and increase the depth of flavour.⁹

3.4.6 Palm Wine

Palm wine, also called palm toddy or simply toddy, is an alcoholic beverage created from the sap of various species of palm tree. The drink is particularly common in parts of Africa where it is known as Legmi, South India (particularly Andhra Pradesh, Kerala and Tamil Nadu.
3.4.7 Neera Super Cleanse

Neera’ or ‘padaneer’ is a transparent sweet juice with pleasant aroma. A natural product tapped from the inflorescence of palmyrah (Borassus flabellifer L.), it is nutritious and rich in sugars, mostly essential amino acids, vitamins like ascorbic acid and B complex, minerals and salts. Owing to its medicinal value, it is popular among the rural and urban population, especially in Gujarat, Maharashtra, Orissa, West Bengal, Andhra Pradesh, Kerala and Tamil Nadu. As a natural and residue-free drink, it builds the body and keeps it cool, improves the appetite and digestion. It will do a lot of good to the asthmatic, anaemic and leprosy patients, and cures digestive disorders.10

The Neera Super Cleanse works to alleviate toxicity and excess weight. The Neera Super Cleanse is a fasting diet that stimulates the body's cleansing process, while satisfying hunger by replacing solid food with pure, nutritious liquid food.

During a fast the digestive and eliminative organs of the body are able to rest and focus on internal cleansing. The body also gets a chance to remove accumulated toxic substances and break down damaged, diseased and unneeded cells. Studies have shown that during a fast the primary cleansing organs of the body, the liver and kidneys, become more active.
The Neera Super Cleanse is not a traditional fast. It was invented to stimulate the body's natural cleansing ability while offering liquid nourishment to keep us from feeling hungry and to give us energy during the cleansing process.

The Neera Super Cleanse is a fasting diet where solid foods are replaced with the pure and nutritious neera drink. The special ingredients invigorate the body's cleansing process, eliminating excess fats, wastes and accumulated toxins, while satisfying hunger, giving the body a break from the work of digesting solid food and allowing it to focus on cleansing. Also, most people really like the added benefit of losing excess weight. During the program the body moves towards its optimal weight as it detoxifies and eliminates toxins.

3.4.8 Methods of Tapping

Though the methods of tapping differ in different places, the essential principles remain the same throughout. On the West Coast of India, the inflorescence suitable for tapping is first trained. Training consists of gentle uniform beating all over the surface of the spathe twice a day, in the morning and in the evening. Then three-fourths of the lower length of the spathe is wound round with a strong string, commonly the fibrous cord of the coconut leaf petiole. In some cases, where there is the fear of the spather bursting, typing precedes beating. After a week's beating, about 7cm to 10 cm of the tip of the spathe is cut off. In some places this naked surface is pounded with the handle of the tapping knife. This process is
continued in the morning and evening for about a week according to necessity. By this time, the surface appears moist due to the oozing of juice.

The early and proper flow of juice depends mainly upon the skill of the tapper; special care is taken not to reduce the flower buds inside the spathe to a pulp in which case the spadix becomes useless. In some places, a 2cm to 7cm wide ring of the spathe from the tip is removed carefully without in any way injuring the spikes. This fresh portion is tied up with tender leaflets. The tapper pares a thin slice off the end of the spathe both morning and evening or once a day. The naked surface is often protected with a cap made of leaf stipule. When the above operations are continued for a few days, the juice begins to trickle. When the flow of juice starts, the paring of the tip is done thrice a day. A receptacle, such as an earthen pot specially made for the purpose, is just hung from the spadix so as to enable the juice oozing from the cut surface to collect in it.

The interval from the commencement of tapping to the dripping of juice depends on the skill of the tapper, the method of tapping adopted, the seasonal conditions prevailing and the nature of the trees. This period varies from about ten to twenty-five days. In the Laccadives and in the Phillippines, when the juice begins to drip, the spathe is removed carefully exposing the inflorescence which is tied together and operated upon. Such complete stripping of the spadix is done to prevent rotting of the tender tissues by contact with the toddy. In some other countries this
purpose is served by making a longitudinal slit in the spathe at the base of the spadix with the tapping knife.

3.5 PALMGUR INDUSTRY - KEY TO RURAL ECONOMY

Palmgur industry is the most primitive traditional village industry in our country. During freedom struggle, Mahatma Gandhi, the Father of Nation declared his determination to implement the Palmgur Industrial activities in an organized way. There are crores of palm trees which can be exploited for production of palmgur and allied palm products, thereby providing opportunities to thousands of rural unemployed youth, especially from the SC/ST community and other weaker sections. With a little training and a small investment capital, one can be gainfully self-employed/employed in this sector. For development of palmgur industry the State Government had established an Apex Cooperative Federation viz., Orissa Rajya Talgur Samabaya Sangha Ltd. way back in 1959. There are 51 Palmgur Cooperative Societies affiliated to this Apex Society. The apex organisation is coordinating the production activities of the primary societies, imparting training to the artisans, providing tools/implements, arranging finance from banks, providing marketing support to palmgur and palm products produced by the artisans. The palm-linked industrial activities are mainly restricted to the SC/ST/ Women and other weaker sections of the society. In the sales outlets, products like neera, palmgur, palm leaf articles, palm fibre brushes, palm candy, palm wood sticks, alongwith broomstick (Jhadu), honey, handicraft items and other products of village industries
are sold. Besides, the federation is also supplying various conservancy articles to the urban local bodies.

A large number of utility and decorative articles are being produced from the leaves of palm trees. Most of these products are attractive having artistic value, and having very good market potential in urban areas and metropolitan cities. Range of palm leaf articles produced in our state are many. Recently palm jaggery as well as sugar cane jaggery has been supplied to state government in the Supplementary Nutrition Feeding Programme. Efforts are taken to extend these activities to all districts, so that a large number of beneficiaries can earn their livelihood in this sector. The state of Orissa has occupied the second position in the country, after Tamil Nadu, in palmgur industrial activities. In Orissa, palm Juice, palm gur, palm Candy and palm fibre brushes, and palm leaf articles are being manufactured from palmyrah palm, date palm and sago palm trees. Like other states, coconut palm trees are not being used for production of neera and gur.

The economic potential of palm trees has been ascertained from the range of various items produced. It has been estimated that a single palmyrah palm tree can yield neera, gur, fibre and palm leaf articles worth of ₹600/- per annum. Similarly, about ₹400/- can be realised from a single date palm/sago palm tree per annum. It has been ascertained from a survey that about 22 lakh palmyrah palm trees, 10 lakh date palm trees and 1 lakh sago palm trees exist in our state. Out of these available resources, only around 20 percentage trees are being exploited for production of
neera/gur and other products; and about 25,000 persons are earning their livelihood depending on this sector. If all our efforts are made to exploit/utilize all the existing palm trees, then about one lakh unemployed poor artisans could be suitably engaged to earn their livelihood, thereby helping a significant improvement in the socio-economic conditions of people living in poverty in rural and tribal communities.

A large number of products are being manufactured from the juice and leaf/trunk of palm trees. palmgur, palm sugar, and palm candy are the direct products obtained from processing of palm juice (neera). Palmgur is obtained by evaporation of juice (neera) to a semi-sold stage. Palm sugar and palm candy obtained by evaporation of juice (Neera) to a semi-sold stage. Palm sugar and palm candy are obtained in crystal form prepared out of palm syrup at the appropriate stage of concentration and adopting suitable crystallization techniques. These products are having valuable nutrients. The aerated beverages (Neera) are delicious, nutritious, rich in sugar, vitamins and mineral. It contains all the constituents of a healthy and refreshing drink.

The nutritive value of neera and gur has been analyzed in different national laboratory and it has been established that it is highly rich in carbohydrate, minerals, protein and iron than handicraft and utility that of sugar cane juice/gur. Because of its medicinal value, palm candy is being used in ayurvedic medicines. Palm toffee/chocolates and soft drinks (Palm Cola) are also manufactured from palm sugar and other ingredients. Recently new milk products i.e. palm milk (flavored milk) in
the market using palm gur which has been widely accepted. Besides the above, fibers from the palmyrah palm trees are being extracted and varieties of eco-friendly products like palm brushes having wider applications (cleaning purpose) are being produced by the artisans. The palm woods are also used as building materials, palm wooden hand sticks and long sticks are in good demand in the market. Considering the utility and food value of various palm products, there is immense potential/scope for further growth and development. By strengthening extending the palm gur industrial activities, the flow of rural poor to urban cities will be restricted. To boost rural economy, and generate huge employment in the rural area there is absolute necessity for growth of this industry. The palm industry deserves promotional support from all corners as it proves to be a key to rural economy.

The Central Palmgur and Palm leaf Products Institute at Madhavaram not only trains people to weave fancy knick-knacks but also promotes palm leaf as an eco-friendly alternative to plastic. The fancy hats, stylish fans and pretty mats are all completely hand-made and have a huge export market. Palm fibre brushes and brooms, also made by the institute, used to be in demand but have lost out to plastic, which is not only easily available but also more durable. Palm brushes are acid proof, environmentally friendly and cost just ₹12 a brush. Export of palm fibre to South Korea, Japan and Africa has increased. The Tamil Nadu Pollution Control Board has developed a sudden fascination for the industry because it sees palm articles as a substitute for plastic. The board has sanctioned funds to the institute to aid research and training for palm products. Palm sugar contains minerals and
vitamins galore, including vitamin C, riboflavin, thiamine, proteins, phosphorus and calcium. It has low sugar content and is beneficial for asthma, anaemia, high blood pressure and heart disease. Neera also has nutritive and therapeutic properties.

The main problem facing the industry is lack of infrastructure and technology. The traditional methods of boiling, straining and crystallising are still followed methods that cannot be used for mass production. Recently, the institute has started making visiting cards and greeting cards out of palm leaves. These have become a rage among ministers but a little more attention to product design and printing techniques would make them more sophisticated. While the fans are exquisitely woven, the handles are rather clumsy. The simple but elegant baskets, trays, pen stands and other items are perfect as gifts or decorations. Re-organisation, planning, focus on product design and gearing up to face the commercial market will not only save a traditional industry but also generate revenue for the government.\textsuperscript{11}

There should be a mass scale promotion programme to make people aware of the economic value of the palmyrah palm. To develop palmyrah industries from the cottage level to large-scale industry, the necessary support services have to be in place. These services include extension advice, credit supply of raw material, training suitable techniques and marketing facilities. Marketing is an important aspect that needs attention for the further development of the palmyrah industry. Possibilities of marketing the various palmyrah products in the foreign market should be explored and interested parties should be encouraged to export the identified
products. Palmyrah products should be used as value added to the various export commodities. For example, palmyrah raw material could be used as packaging material in the form of bags and boxes; fruits, tea, vegetables, coffee and spices could be packed in these.¹²

Export markets should be carefully selected. Applying a permanent quality control system therefore, is strongly suggested. Identifying attractive export markets, estimating the export potential for different products, characteristic of demand, consumer requirements, social differences etc. have to be seriously studied and evaluated in this connection. Attractive returns have to be planned and executed in order to keep people within the trade and to uplift the industry. Establishing small industrial units as cottage industries and introducing appropriate technology with suitable small machinery are stressed. Active marketing divisions handle the entire marketing system with authority. Mechanization of the industry is an appropriate policy to increase returns by reducing unit cost and increasing productivity. The mechanization can be implemented by organizing small production units under the umbrella of the palmyrah producers' association.¹³

The Khadi and Village Industries Commission (KVIC) is promoting 'neera', extract from palmyrah trees, as a health drink, so as to uplift the depressed toddy-tappers economically. If an initiative could be worked out to market neera as an alternative soft drink, the toddy tappers could see the light of the day. Fermented neera is toddy, which is facing stiff competition from IMFL (Indian make foreign
liquor). If neera could be filtered properly using a simple scientific method and if
some preservatives added as prescribed by the pune-based national chemical
laboratory, immediately after extraction, neera could be bottled or canned and stored
for six months.

Chilled neera is a very nutritious drink. It contains a number of minerals and
salts; acids like ascorbic acid, nicotinic acid and riboflavin; and also proteins and
vitamin C. It has less calorific value, apart from being sweet and delicious. It has
been medically proved that neera is better than mineral water. The problem is lack of
initiative both from the government and the private growers and the non-existence of
a proper marketing network. If bottling neera was a problem, initiative could be
taken to encourage farmers and tappers for bulk extracts for converting them into
palm sugar. The central palmgur and palm products of Chennai and the palm sugar
federation of Niddavole specialised in manufacturing palm sugar, which has a good
export potential if tapped properly. If the extract of neera was limited to five months
in a year, KVIC got a programme in collaboration with the district rural development
agency to train people in fancy articles from palm leaves and that could act as an
alternative source of income for the rest of the year.  

Toddy was a Swadeshi liquor and even the sangam period, toddy had been a
part of people’s diet. There were several evidences in sangam literature. Fresh toddy
and sugarcane juice were similar because they don’t give any intoxication. They will
intoxicate only on fermentation. Further, total prohibition was quite impossible. The
Federation of Tamil Nadu Agricultural association has threatened to launch an agitation if the state government failed to lift the ban on toddy extraction that would "up-lift rural economy". Considering the abundant availability of palmyrah products in our country and considering our population, if this campaign is being taken up vigorously by Ministry of Agriculture through advertisements in dailies and medias will definitely increase the consumption of palmyrah products.

Since ancient period to till today the palmyrah palm is a friend of rural folk. Directly, it provides employment to the toddy tappers, indirectly a significant section of people who lives in the rural segment gets livelihood through abundant source of palmyrah palm by marketing the products and products of the tree. And also it is a tree of eco-friendly and ultimately most economical one.
References


10. palm sugar@Everything2_com.htm

