CHAPTER - III

AGRO-INDUSTRIES - A CRITICAL STUDY

PART - I

Concept and definition of Agro-industries:

The term 'agro-industries' means industries manufacturing inputs for agriculture as well as industries engaged in processing of agricultural raw material.

Agencies engaged in manufacturing agricultural inputs like fertilisers, pesticides, tractors, trailers, seeds and other farm equipment and machinery as well as servicing centres and repairing workshops are termed as agro-industries; while those processing units directly or indirectly absorbing agricultural output as basic raw material are known as 'agro-based industries'. The agro-based industries aim at the maximum utilisation of primary and secondary agricultural produce such as paddy, wheat, sugar cane, cotton, tobacco, jute, chillies, fruits, vegetables, groundnut and other oil seeds and also industries making use of surplus agricultural waste like straw, shells, husk, sugar cane bagasse, jute stalks, etc. Sometimes taking into account the second and third stage of processing,
the term is said to include industries like bakery, starch making and biscuit making also.

A list of agro-industries has been prepared by a joint group consisting of representatives of the Planning Commission, the Ministry of Food and Agriculture and the Ministry of Industrial Development, Internal Trade and Company Affairs. These industries may be broadly classified as follows:

1) Products of plant and vegetable origin.
2) Products of animal and marine origin.
3) Products of natural and mineral wealth.
4) Inputs required for agro and agricultural industries.

The present study of agro-industries is confined to the products of plant and vegetable origin of Andhra Pradesh with special reference to East Godavari District where all the units under study are located.

**Economic Significance:**

Agriculture plays a dominant role in the economic structure of the country, more so in the state of Andhra Pradesh. Industrialisation is one of the chief objectives of every country. But the relative position of agriculture and industry in the basic factor which determines the difference

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between the developed and developing countries in their economics. In developing countries agriculture generally accounts for the major portion of national income. The level of income derived from agriculture is generally lower than the income derived from Industry, Trade, Services etc. Consequently services, export, manufacturing and other industries play only a passive role in the agro-based economy. In the developed countries non-agricultural sector plays a dominant role. Economic prosperity of a developing nation like India lies in successful integration of agriculture with industry.

In spite planned efforts to put the country on the path of industrialisation, a major portion of India's population is concentrated in rural areas and their mainstay is agriculture. Hence it is agricultural production which largely determines the real rate of growth. The space at which industrialisation can proceed depends mainly upon the agriculture surplus for masses and agricultural raw material for the industry.

The level of economic development of a country mainly depends upon the availability of natural resources and the degree of their exploitation, which constitutes the bedrock of the economy. In most of the developing countries, agriculture provides a market for industrial products, not only for consumer goods but also for a wide range of equipment.
and material used in agricultural production. In an agro-based economy like ours, it is the agricultural sector which is subjected to considerable strain and stress, specially during the period of rapid industrialisation. It is imperative that the rate of growth of agricultural output largely determines the rate at which industrialisation can proceed.1

On the other hand, agriculture depends on industry not merely for consumer goods which give incentive to raise their products but also for the inputs which are needed for modernization of production.

Industrialisation, thus, cannot precede but follow increased agricultural production. The most essential aspect of the relationship is that each sector depends very largely on the demand of the other for its products. This integration of these two important sectors namely agriculture and industry has given birth to an harmonious link which is what we call 'Agro-industries', not only for their development but also for mutual existence.

As long as the productivity of land is low, industrialisation cannot catch up real momentum. It is, therefore, essential to increase the productivity of land on war footing which constitutes a prerequisite for diversi-

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1. For an attempt to determine the rate of growth of agricultural output needed to sustain different rates of growth in industry in India. See Asok Rudra, 'Relative rates of growth, Agriculture and Industry', Economic Weekly; 16(45), November 1964, pp. 1781-1783.
The Director General of the International Labour Organisation in one of his reports said: "The economically underdeveloped countries are rich in people whose skill potential is inadequately developed, who have insufficient opportunities for productive employment, who lack organisations which would enable them to produce more and whose health and living conditions severely limit their productivity".

The same is true in case of India whose economy is stagnant, agricultural techniques still primitive and tools out-dated. Consequently the productivity is low. To bring about marked improvement, we have to make structural and technological changes necessary to develop and intensify agriculture. For this purpose agro-industries are considered as the most suitable agency.

The present state of affairs presents an ugly picture and agriculture remains more or less a way of life rather than a business. When technological development is going on rapidly in advanced countries of the world, we cannot afford to remain idle and allow to continue the present stage of quasi-equilibrium of agricultural development. It is in the best interests of the country that we change our concept and choose mechanisation of agriculture and development of agro-industries. This is the surest way of competing with

1. The Indian Express; Vijayawada, 15 April 1972.
with other developing countries and those countries which are already developed.

It is feared that a large number of people will be thrown out of agricultural sector, in case we choose mechanisation. But the benefits accruing out of the development opportunities to semi-skilled and un-skilled labour in rural areas.

So far no systematic survey has been made in India to assess the anticipated unemployment and the possibility of alternative employment in the industrial sector. But it is admitted by and large that though some persons may be thrown out of employment from the agricultural sector, the cycle of mechanisation will definitely create more and better opportunities for employment in the industrial sector.

Japan which is an Asian country, provides an ideal example in the matter of mechanisation and development of agro-industries. We can thus choose the agro-industries as an instrument to enhance the productivity of land and profitability of activities concerning agriculture in order to exploit the treasures of land to the best advantage of the farmer.

Industries can broadly be classified into two groups: 1) resource based and 2) non-resource based. The resource based industries depend mostly on the indigenous raw material while the latter group cover manufacturing activity largely on materials brought from outside the state(region).
In view of the well developed agricultural base, the N.C.A.E.R. Survey Report for Andhra Pradesh recommended for the development of maximum number of industries based on agricultural products on two broad based objectives: 1) that all the agricultural raw material which is available in the state should be utilised to the maximum extent in the state itself and 2) if utilised within the region, create many indirect and secondary economic benefits through a chain of varied industries based on each product.

The survey conducted by the National Council of Applied Economic Research has identified that "the prospects for the development of the non resource based industries on a large scale in Andhra Pradesh are currently not very bright in view of the state’s industrial backwardness and the absence of a strong entrepreneurial base although there is an immediate need to create the necessary environment for its development to evolve a balanced structure and sustained growth of the industrial sector in the state".¹

At present a substantial part of the raw-material is exported to other states and the products remaining within the state are utilised in the industries, mainly for

¹ Techno-Economic Survey of Andhra Pradesh, op.cit.p.112.
primary processing. Hence the complete chain of industries for each product has not been developed in the state.

It is, therefore, necessary to create congenial atmosphere for the development of a comprehensive agro-industrial complex in the state. The present position of the large scale production of some of the commercial crops in the state offer great possibility for the establishment of agro-industries for making use of agricultural material as well as bye products of some of the industries. Once processing units to absorb agricultural raw material near production centre are established, and the demand for raw material of good quality is assured, the farmers are likely to grow more commercial crops increasingly. Besides, offering a remunerative price will be a motivating factor for the growth of agro-based industries. It is, therefore, necessary to follow a co-ordinated approach between developing plans for agriculture and agro-industries so that all round agro-industrial development is assured in the state.
PART - II

DEVELOPMENT OF VARIOUS AGRO-INDUSTRIES IN ANDHRA PRADESH

The economy of the state is primarily agriculture oriented. Besides rice, jawar, maize and bajra a wide variety of commercial crops are grown in all the district of the state. Of these tobacco turmeric, castor seed, groundnut, sugar cane, chillies, mesta, coriander, coconut, cotton are important. In the following pages an attempt is made to explain the importance of the paddy crop in the economy of the state and the development of the agro based industries.

Paddy Processing:

Paddy is the most important crop of the state. Among the rice growing states of the country, Andhra Pradesh ranks sixth in regard to the area and fourth in respect of production. Paddy is grown in almost all the districts of Andhra Pradesh. Important rice growing districts are West Godavari, Krishna, East Godavari and Nellore in Andhra Region and Nizamabad, Warangal in Telengana region. Rice accounts for 24 percent of the total cropped area in the state. About 94 percent of the area under this crop was irrigated during 1972-73.

Hand pounding of Paddy:

The hand processing of paddy is a very ancient industry concentrated mainly in villages. The hand
processed rice is known for its nutrition value and also for its large employment potential. The implements used are of simple type. During the course of time the implements like pestle and mortar were introduced and are being used even today in large areas of paddy growing areas of India.

At the beginning of the present century, power driven rice mills came to replace the ancient traditional hand pounding industry. From being a simple home and village small scale industry providing self employment to millions of people and also to some more millions of working women in their own homes or villages on a respectable living wage which was mostly paid in kind—paddy processing business has now grown to be a big industry involved fully in all the ramifications of finance, banking, marketing, cornering of stock and price fluctuations, scarcity and glut.¹

It has withstood the onslaught of rice mills and huller and therefore, nearly two thirds of the paddy converted into rice in the country is by hand pounding even today². The marketing of hand processed rice inspite of its higher nutritious value, has become difficult mainly due to higher cost of production and partially because of unfavourable consumer taste to its colour. If we can succeed in bringing down the

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cost by systematic efforts like introduction of better tools and techniques improving the managerial efficiency etc., can put this industry in good shape. Systematic efforts, therefore, have to be made to overcome these difficulties. The important place it occupies among the village industries has brought it under the purview of the Khadi and Village Industries Commission in 1953-54.

Since the inception of this scheme, it has made a steady progress. The scope of the industry has so far been confined to revival as well as development of hand pounding of paddy industry. The specific schemes for providing assistance and technical guidance to the implementing agencies, formulated in accordance with the needs and resources in the initial stages, have since undergone many changes and the final pattern that has now emerged appears to be capable of ensuring more satisfactory results.

Experience gained during the past few years clearly indicates that effective solution to the problems of backward techniques of production, inadequacy of trained personnel and competition from rice mills and hullers will pave the way for an accelerated development of hand processing of paddy industry.

High Nutritious value:

A common feature in rice eating countries of the world, mostly confined to Asian countries is malnutrition. The

1. Ibid.
2. Ibid.
unpolished rice, which is rich in nutrients, loses considerable amount of its nutrients after milling.

In view of its high nutritious value of hand pounded rice, and also because of its highly labour oriented nature, efforts should be made to develop this village industry in places where milling has not yet been established. In areas where the prospects of establishing of rice mills are not bright due to lack of infra structure facilities, hand pounding of rice is bound to make an impact on the rural people. In Andhra Pradesh, there are a large number of small villages where electricity has yet to reach and communications are underdeveloped especially in Agency tracts of forest regions, the development of this industry promises manifold advantages. The government may specify such areas and give protection to this ancient village industry for its development and growth.

**Rice Milling:**

The superiority of the Mills over hand pounding gave great impetus to the present position of the rice milling industry in the country. Rice milling industry is well developed in the state and the entire paddy is processed within the state. Most of the rice mills are in the hands of rich paddy dealers and well to do farmers. The most striking feature of these millers is that they indulge in speculation for their gains and little attention is paid to processing activity. This situation leads to monopoly in paddy trade and price rise. Efforts should be made to break this stronghold not only for price establishment
but also for total elimination of speculation.

Besides, the rice mills are not evenly located in all the paddy growing areas of the state. In certain areas the concentration is more and in other areas less. Where the concentration is heavy, rice mills run for 200 to 220 days in a year. It may be noted that the willing cooperation of marginal and small farmers of the village can be obtained for bringing them under cooperative fold. Besides supply of credit, fertilizers, seeds, equipment, etc., marketing of the produce through a marketing society may result in price stabilization as well as in elimination of speculation in paddy trade.

Most of the mills in Andhra Pradesh are of huller/sheller type. In Andhra Pradesh there are 10,779 hullers, 1005 shellers and 3,568 huller cum shellers and 15 modern rice mills. The total production of paddy in Andhra Pradesh is 71 lakh metric tonnes. In huller type mills, the rice yield is lower. Due to excessive breakages, husk and bran comes out in a mixed form and the same cannot be separated subsequently. Because of this the rice bran got from these mills can neither be used for extraction nor as cattle fodder due to excessive fibre and silica contents. The sheller type is slightly improved and better than the huller type of mills. These rice mills are un-economical as the output

of rice will be as low as 65 percent sheller type rice mills and improved over huller and since better outturn of 69 percent which is an improvement of 4 percent.¹

Modern Rice Milling:

In India rice is used as a staple food by majority of the people. It is produced on more hectares and consumed by more people than any other agricultural commodity. Inspite of its predominant place in the economy of the country, rice milling has remained one of the most neglected industries. We have been importing rice spending valuable foreign exchange. The imports are to the extent of 2 percent of over production in any year. The Planning Commission evaluated that this shortage can be overcome by processing the available paddy by applying modern rice milling methods and scientific shortage techniques.

Under the Rice Milling Industry (Regulation) Act, the Central Government has made it obligatory to change the conventional rice mills into modern mills within a period of three years and in special cases up to five years with effect from May 1970. However, as the existing cooperative rice mills are incurring losses largely on account of state government paddy/rice levy policies, they are not willing to invest funds for modernisation of their plants and to establish rice mills. To remedy the situation whenever necessary the state governments paddy/rice levy policy will have to be suitably

modified.

A new rice milling technology which will result in higher outturn of rice and utilisation of bran for making edible oil has been perfected and is ready for implementation throughout the country. The new technology developed by the Paddy Processing Research Centre at Tiruvuru in Tanjavur district (Tamil Nadu) involves an addition of a few mechanical units to the existing hulling units to separate the function of de-husking from polishing and introduction of new units for grading of de-husked paddy before polishing. According to the ex-chairman of Food Corporation of India, R.N. Chopra, this will bring about a revolution in rice milling technology and legal measures to compel the hullers to go in for such modification are in the offing.

It has been estimated that the country can get at least five lakh tonnes of more rice and at least three lakh tonnes of edible rice bran oil by adopting the new technology.

The Food Corporation of India has examined the new technology in a hired rice mill at Muttaiam in Tanjavur district with an investment of Rs.20,000 for modifications of the mill. The additional recovery of rice and bran fetched

1. Proceedings of the conference of Registrar of Cooperative Societies at New Delhi Sept. 29 and 30, 1972, Govt. of India, Ministry of Agriculture (Department of Cooperation) (Cyclostyled)
2. The Indian Express, Vijayawada, November 4, 1974.
3. Ibid.
an additional return of Rs. 48,587.50 a year. The mill which processes about 8.5 tonnes of paddy per day, now produces an additional quintal of rice daily. It produced 400 kg of bran daily which has 22-23 percent of oil content.

There are thousands of huller mills in our country which need modernisation. The new technology can bring additional income to the millers and higher outturn of rice to the country's buffer stock.

On the basis of an evolution study conducted by an expert team appointed by the Government of India, it has been found that the rice output from a modern rice mill is 6.6 percent higher than that of huller rice mill and 2.5 percent higher than that of sheller rice mill on an average. In case of parboiled paddy the increase in output is 1.6 percent higher than the huller yield on an average and 0.8 percent than the sheller yield on an average, when rice is processed on a modern rice mill. Apart from this, there is a considerable reduction in breakage of rice, when rubber roll shellers are used for dehusking paddy.

Features of modern rice milling:

Modern rice milling consists of the following machinery viz. cleaning and handling equipment, parboiling and charging equipment, milling machinery, grading equipment by product treatment units etc.

1. Ibid.
1) Paddy cleaner: Generally paddy received in a mill for processing will be in the pre-cleaning state. Before it is ready for feeding into a mill, cleaning is done in a scapling machine which helps in removing large slumps of earth, straw etc. But in modern rice mill, care is taken to remove the foreign matters, such as dust, clay, stones, straw, iron particles, sand, chaff etc. For this purpose a cleaner is installed to clear the paddy. Besides cleaning the paddy of foreign matter, it improves the life of the rubber shellers and other parts of the machinery. Consequently the bran that comes out will be free, to a large extent, from the acid insoluble ash content of the bran. Therefore a cleaner is a must for all modern rice mills using rubber roll shellers. An ideal cleaner is expected to remove completely all the impurities. However in practice, any machine that removes a major part of the foreign matter present in paddy is generally acceptable. There is no such cleaning device in conventional rice mills and uncleaned paddy is administered in hullers resulting in the admixture of finished rice with all sort of foreign matter. Even the inert materials comes out in a mixed form in the bran also.

Rubber Roll Shellers:

The rubber roll sheller is an important item of the modern rice milling technology, which to a large extent adds
to the efficiency of rice milling. Even the rubber lined dehusker is being used which serves the same purpose as that of rubber roll sheller. The shelling life of rubber roll shellers, which are being made in the country, is estimated to be of 200 tonnes with par-boiled paddy and 100 tonnes in case of raw paddy. The rice millers are complaining about the wear and tear of the rubber roller shellers, which is considerable. Hence there is a need to undertake research in improving the quality as well as shelling life of rubber roll shellers. Manufacturers are engaged in further research in improving the quality. The use of polyurethane rolls is also being studied for obtaining better service. At present various manufacturers are engaged in making different sizes of rolls to suit the requirements of different types of machines. Even the patent designs vary from one another and have special advantages in each case. Unless a standard and acceptable design is evolved to the satisfaction of one and all, this problem cannot be tackled effectively. It also helps in cost reduction and facilitate inventory control by the millers. At present majority of the mills are being operated by unqualified hands, without special training and knowledge. Most of them gained experience only in huller type mills where it is simple to operate with less technical knowledge.

Rubber roller shellers can be put to good use if certain
precautions are taken such as interchanging the rolls from right to left and vice versa as per the manufacturers instructions, and by cooling the rolls during shelling at proper temperature.

So far 24 modern rice mills have been financed by the Andhra Pradesh State Finance Corporation, out of which 12 mills have already been commissioned. Most of the modern rice mills financed by the corporation could not fare well especially during 1974-75 due to government levy policy and as such the corporation has now stopped financing more modern rice mills in the state.

Suggestions:

The following suggestions are made for speedy implementation of this new rice milling technology in the state:

1. The central government should evolve a National Policy for propagating the new rice milling technology in all the rice producing states of India.

2. The Food Corporation of India/ The Andhra Pradesh Agro-industries Corporation Ltd., as the case may be, should be entrusted with the task of hiring mills for the purpose of modernising at least one unit in a district in all the rice producing states of the country on experimental basis for a period of 5 years initially.

3. Establishment of huller rice mills should be discouraged or stopped completely.

4. The renewal of licenses for old and antiquated mills should be discontinued.
5. In future licenses should be granted only for the establishment of modern rice mills based on new technology.

6. As far as possible, modern rice mills should be located in rural and semi urban areas.

7. While hiring rice mills, huller mills under cooperative sector should be taken up for modernisation.

8. Bank loans should be made available to all rice mills for modernisation.

9. Technical knowhow should be made available to the millers and to all those who are interested in establishing or modernising the existing units.

10. Technically unemployed should be encouraged to start modern rice mills under self employment schemes.

11. Industries based on the utilisation of by products of rice milling industry should be encouraged.

12. Industries manufacturing the machinery and other equipment required for modernisation etc., should be encouraged.

13. Services of technical officers should be made available to propagate modern technology and allied matters.

14. Paddy collected under compulsory levy should be processed in the rice mills so hired.

15. Efforts should be made to coordinate the activities of industries department, revenue department and the Food Corporation of India the Andhra Pradesh Agro-Industries Corporation Limited.

Caution:

The millers are not showing much interest in the modern rice technology as they think that it serves no useful
purpose. Their pleas is that the type of paddy which is presently grown under short duration crop in the state is not suitable for modern rice milling, as the breakages will be more and rice bran yield also may not be substantial. The wear and tear of the rubber roller shellers which are employed in shelling paddy is also considerable. They cited the example of a modern rice mill established at Tadepalligudem in the West Godavari district.

Before we embark on modern rice milling technology in the state, efforts are to be made to examine the feasibility and profitability of its introduction in Andhra Pradesh, taking into consideration whether the objections raised by the rice millers in the state are genuine or fake.

The future policy should be directed towards the modernisation and expansion of the existing mills. At present there is little scope for increasing the number of units as most of the units are having idle capacity. The outturn of paddy also has not made any substantial increased in the state. Unless the real break through in rice is achieved, the prospects for establishing the additional units are not bright.

**Deoiled Rice Bran:**

Andhra Pradesh is one of the richest agriculturally developed states and produces about 4.5 to 5 million tonnes of paddy annually for home consumption and also substantially contributes to the buffer stock. If the entire production of
paddy is processed, an yield of about 270,000 to 300,000 tonnes of rice bran can be obtained and if the entire quantity of rice bran produced in the state is used for extraction of oil, the oil so produced can substantially meet the non-edible oil requirements for the soap industry. At present, the country's non-edible oil deficit is met by imports, causing a drain on the foreign exchange resources.

Bran is one of the by products of rice milling industry. Bran has an average oil content of 15 percent. The oil is rich in fatty materials and it can be processed to yield an edible oil called 'rice bran oil'. It has been found that every quintal of paddy contains, on an average, about 2.5 kg of oil.

De-oiled rice bran is another important agro-based product in the state of Andhra Pradesh. The state produces about 30 percent of India's total production of deoiled rice bran.

The developing of this industry is of recent origin and for a very long time there was no industry to utilise this very important by product of rice milling industry. This industry is mainly concentrated in the coastal Andhra region of the state. The exports have recorded a steady

2. Recent Advances the Rice Processing, Milling and By-Products Utilisation(cyclostyled)
increase from year to year and reached a level of Rs.1.25 crores during 1970-71. The state offers a considerable scope for further expansion. Deoiled rice bran is used as animal feed.

Rice Bran Utilisation:

A peculiar practice in the state not found in other states is the use of rice bran as animal fodder. It has been found to have harmful effects on the health of the animals. Due to the presence of lipase in rice, the oil undergoes very rapid hydrolysis with the result that the free fatty acid of the oil rises up to 40 to 45 percent whereby the acidity starts.

The deoiled rice bran is more nutritious and offers the following advantages:

1) easily digestible;
2) no problem of free fatty acid formation;
3) less chances of fungus growth;
4) Higher nutritive value.

In view of the advantages offered by deoiled rice bran over rice bran, the use of deoiled rice bran should be encouraged for the consumption of cattle. There is need to popularise its utility and convince the cattle breeders of the advantages it has over rice bran.

1. Recent Advances in Rice processing, Milling and By-products utilisation, pp.5,6.
Decoiled Cakes:

Andhra Pradesh produces several varieties of oil seeds; of these, groundnut, castor, cotton, safflower (Kardi), sesamum and linseed are important. The deoiled cake industry has, therefore, assumed importance in the area of exports. The industry is concentrated mainly in Kurnool district, even though the oil seeds are grown in almost all the districts of the state.

The varieties of cakes produced in the state are groundnut cake, cottonseed cake, safflower (Kardi) mohwa cake and castor cake. Besides these, compound cattle feed is also exported from Andhra Pradesh. The annual exports of these cakes range between Rs. 3 to 4 crores.

Deoiled groundnut cake is one of the important agro-based products being exported from India to the tune of 20 percent of the world total demand. This commodity constitutes about 78 percent of India's bulk export of deoiled cakes. Andhra Pradesh is a major producer of deoiled groundnut cake in the country and its exports account for about 0.4 lakh tonnes. The exports during 1971-72 were Rs. 2.53 crores showing a decline, but they have picked up during 1972-73 accounting for about Rs. 4 crores.

2. Ibid.
Paddy husk and its utilisation

The husk and chaff that comes out during processing of paddy would be about 25 percent of the total weight. Thus a rice mill processing 40 tonnes of paddy per day will produce 10 tonnes of husk as a by-product. Out of this, only 25 to 30 percent is being used as fuel for boiler for producing steam in for boiled rice mills. In the country nearly 50 percent of the total rice produced is parboiled. The remaining paddy husk is not put to any useful purpose.

In recent years attention has been paid to the utilisation of paddy husk; some hotels are using it as fuel and the remaining husk is thrown away as waste. It is, therefore necessary that efforts should be directed towards its use at a time when the country is facing an acute shortage of fuel. For generating of steam in parboiled rice mills, paddy husk can be put to economically where turbo-generators are installed, it can also provide power for running the machinery as well. In case there is a bran oil plant attached to it, it can serve the dual purpose of getting power and steam through this source. The husk is used for generating steam through heat exchangers for drying moist or parboiled paddy. The increasing use of heat exchangers for heating the air for drying the paddy has presented many problems. The heat generated by this method is not very high. A large portion of husk which is used is partially burnt with the result that black ash comes out. In
order to get the full value of the fuel used, there is a need to evolve a satisfactory method of designing as well as efficient combustion which can give white ash content.

There is need for more intense research to find means of briquetting or other means of ensuring steady and efficient means of burning husk. Wherever it is feasible, the means of converting husk into forms (like firewood) which can be burnt, without much smoke, as domestic fuel should be taken up. Extruding presses suitable for converting husk into the desired shapes and sizes, with or without suitable binders, should be designed and used for this purpose. This line of development will not only meet a growing need, but also prove to be highly paying. The Food Corporation of India is at present working on the feasibility of producing 'hullite' from paddy husk.

The Regional Research Laboratory, Assam, the Indian Institute of Technology, Kharagpur and other institutions have already taken up the work on the utilisation of paddy husk and brought out a number of project reports.

The Regional Research Laboratory, Assam has developed the following processes for utilisation of paddy husk, which hitherto was/considered as agro-waste, as the chief raw material.

1. Recent Advances in Rice Processing, Milling and byproduct utilisation - Paddy Processing Research Centre, Tirumurur, Tamil Nadu, pp.9-10. (cyclostyled).
1) Bricks from paddy husk
2) Bricks from paddy ash
3) Household detergent based on paddy husk
4) Masonry cement from paddy husk

The Regional Research Laboratory at Hyderabad has evolved a process of utilisation of rice husk for the production of high grade active carbon.

1. **Bricks from paddy husk**

Burnt clay bricks which are used in the construction of houses and other purposes have become very expensive and are out of reach of the common man. In the process evolved the agro-waste mainly paddy husk, can be utilised in making bricks which can be used in the construction of houses. The main feature of this process is that these bricks can be made at the construction site itself using suitable binders and with the help of simple brick making equipment. It has been estimated that the cost of such bricks manufactured with husk varies from ₹80 to 90 per thousand.

**Bricks made from husk have the following advantages:***

1) Light weight
2) Less dead load
3) Saving in foundation due to less dead load
4) Cheaper
5) Easy handling
6) Better insulation and attractive appearance
7) Production not effected by seasonal changes.

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2. **Bricks from paddy husk ash**

Paddy husk ash can be obtained from the mills directly or from other sources and the same is treated. Suitable quantities of paddy husk ash and filler along with binder and other chemicals are mixed together with water. The bricks are moulded in a brick making machine.

Bricks made from paddy husk ash has the following advantages:

1) Light weight—weighs about 2.2 kg against 3.5 kg burnt clay bricks.
2) Reduced dead load
3) Saving in foundation due to reduced dead load
4) Cheaper
5) Easy handling
6) Better insulation and attractive appearance
7) Production not affected by seasonal changes
8) Strength to density ratio higher than burnt clay bricks.

3. **Household detergent based on paddy husk**

In India, dish washing detergent powder (like VIM) is very expensive and hence the same is not within the reach of common man. The production is under taken by companies and their marketing and over head charges makes the product costly. It contains more than 50 percent of Silica flour and the same can be prepared locally with the available raw material like paddy husk along with other raw materials. The detergent powder so manufactured from paddy husk as the chief raw material costs less. By using the available paddy husk in different parts of the country, a large number of

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1. Ibid.
of small units can be started successfully. Andhra Pradesh being a rich paddy growing state offers bright prospects.

4. **Masonry cement from paddy husk ash:**

Cement has become a scarce commodity because of its high cost and limited supply which has placed it beyond the reach of common man. A new process developed by the Regional Research Laboratory, Jorhat (Assam) for the manufacture of cement like material from paddy husk has opened new opportunities for commercial exploitation of the agro-waste like paddy husk in the country on a large scale. The material can be put to a large variety of uses like plastering, foundations, concrete work, masonry mortar etc. About 60 million tonnes of paddy is milled in India per year. In case the entire paddy is husked it will yield 4 million tonnes of ash, and the same can be utilised for processing the cement like product. All the equipment and other machinery required for this purpose is indigenously available or can be fabricated locally. The cost of production is estimated at Rs.100 per ton.

The cement like product has the following advantages:

1) Low cost of production
2) The capacity of plant can be designed according to the availability of raw material.
3) In different milling areas separate mini plants can be set up without much affecting the cost of production.

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1. Cement like product from paddy husk for use in Masonry works, Regional Research Laboratory, Jorhat, Assam. (cyclostyled).

2. Ibid.
5. **Active Carbon from rice husk**

The Regional Research Laboratory, Hyderabad has evolved a process of utilisation of rice husk for the production of high grade active carbon. Active carbon will be of high absorption capacity and low ash content and thus is particularly suitable for the pharmaceutical industry. At present, a part of the requirements of the country are met by imports. It is envisaged that the active carbon made from paddy husk will fill the gap.

Besides, sodium silicate obtained as a by-product of this industry may be useful in the manufacture of soap, paper, and other industries. Thus, a cheaper variety of activated carbon made from paddy husk can be used for the bleaching of oils, sugar, syrups and in other bleaching operations.
PART-III

TOBACCO INDUSTRY

Andhra Pradesh enjoys the pride of place among the tobacco growing states in India. The main varieties of tobacco produced in the state are flue cured Virginia tobacco and 'natu' or desi tobacco. Besides these, varieties like 'Rayala', Harrison special, 'Toka-aku', and white Burley are also grown. Tobacco is largely grown in Guntur, Prakasam, East Godavari, Krishna, West Godavari, Kurnool and Khammam districts. The state has a near monopoly in the cultivation of Virginia tobacco, with more than 95 percent of the country's total production of this variety. It accounts for 95 percent or ₹35 crores worth of tobacco exported from India annually.\(^1\)

Export is done mainly from Guntur and Prakasam districts.

The largest demand in the international market is for flue cured Virginia tobacco of which India is the second largest exporter.\(^2\) Out of the total exports of ₹31.39 crores and ₹42.25 crores in 1970-71 and 1971-72 respectively, flue cured Virginia tobacco accounted for ₹29.24 crores and ₹39.49 crores. The Government of India earns about ₹150 crores yearly by way of excise duties and about ₹3 crores through export duty.\(^3\)

2. Rashad Ahmad Siddqui and M.K. Dalal, The appraisal of grading and standard of some of the important agricultural and agro-based commodities in A.P. op.cit.
The tobacco industry is engaged in purchasing leaf tobacco from the farmers, handling the tobacco purchased by grading, stemming etc. processing the same by what is known as redrying and supplying the processed tobacco to cigarette manufacturers in India and abroad. There are about 150 units in the leaf tobacco industry in Andhra Pradesh. The number of workers employed in this industry (of whom bulk are seasonal workers) is estimated at about 93,000.

The changing trend in the world market in respect of quality and price has made the future position of India somewhat gloomy. In the recent past, a large number of countries have newly entered the market, producing quality flue cured tobacco under more favourable soil and climatic conditions. In India the production is confined mainly to traditional black cotton soils and the type of tobacco which is grown does not suit the requirements of the importing countries. Development schemes have been drawn up in this direction to increase the production of flue cured and other cigarette tobacco to meet the weight and quality targets. The future production of flue cured tobacco on light soils in different parts of the country offer better prospects of quality tobacco.

Marketing problems:

The crisis in tobacco trade has become a regular feature in Andhra Pradesh, causing anxiety to growers, traders, exporters and also to the government. Any year during

which due to favourable trend in the world market, higher prices were paid by exporters/traders, resulted in a steep increase in production in the year followed. Of course, this is a common factor in the cultivation of any crop, more so in case of commercial crops. As a result there will be a slump; this happens in an uncontrolled economy. It is quite but natural that the exporters and traders may not be in a position to offer remunerative prices resulting in an alarmed situation and causing anxiety to growers.

The Virginia tobacco which is grown in Andhra Pradesh is intended either for exports or to be used in the manufacture of cigarettes in the country. Since the local consumption, by and large, is limited we have to depend more on exports.

The growers complain that the prices offered by the purchasing firms are unremunerative resulting in a heavy loss to the ryots. The cost of cultivation is increasing in view of the price rise in inputs like fertilisers, pesticides and insecticides as well as seedlings, apart from the rise in the wages paid to the agricultural labour.

Every year the farmers urge the government to come to their rescue and fix a reasonable remunerative price before stocks are put in the market for sale. In case the purchasing firms fail to concede the demand both the state and central Trading Corporations State/should come to the field to purchase the tobacco and
and pay a reasonable price after a scientific scrutiny of growers' cost. While pressing for a price of Rs.1,200 per quintal for fourth grade tobacco the growers feel that there should be a statutory committee consisting of representatives of the State Agricultural Ministry, Marketing and Export Promotion Department together with growers' and trader's representatives for fixing a reasonable price every year before the commencement of season taking in the account the cost production. Tobacco exports, however, fell recently. The reasons for the fall were attributed to lower imports by USSR and Bangladesh and also lower production of exportable varieties in 1972-73. As against 131 million kg. of flue cured virginia tobacco produced in 1971-72, its production in 1972-73 was estimated at less than 100 million kg.

According to the unions, the leaf tobacco industry is in a flourishing state and there is likely to be further growth. The consumption of cigarettes in this country has increased and the number of exporters has declined from about 62 in 1964 to about 38 in 1969.

2. The Indian Express, Vijayawada, Nov. 26, 1974.
According to the Indian Trade Association and other employers, the tobacco industry has to depend on overseas market as it is an export oriented industry. The quantity and quality of crop depend much on the vagaries of climate. In the export market, increased costs cannot be passed on to the consumer because of severe competition from other countries. In case the cost of production is increased further there is a danger of India being outwitted from the international market. As a matter of fact the exports have gone down from 72 million kg. in 1964 to 55 million kgs. in 1969. The leaf tobacco industry is struggling hard to sustain the level of exports.

The chairman of the Tobacco Export Council, in his address at its 13th annual general meeting has pointed out that "apart from traditional countries exporting F.C.V. (flue cured Virginia) tobacco viz., U.S.A. and Canada, there are other countries such as Thailand, South Korea, Phillipines and Pakistan which have increased and their production of tobacco to a considerable extent and are trying vigorously to have a share for their tobacco in world markets. It is also a matter of concern to us that those countries are in a position to supply F.C.V. tobacco at low prices. U.K., Japan and other countries are increasing their import duties and the export duty levied on export of Indian tobacco adds further to the cost of Indian tobacco, so much so that Indian tobacco becomes more and more non-competitive in the international
markets. There is no gainsaying the fact that by abolition/reduction of export duty, Indian tobacco would become more competitive. The Council has already submitted a detailed note to the government favouring the abolition/reduction of export duty.¹

In addition to the above Pakistan, Thailand, South Korea, Brazil and other countries have increased the production, in recent years. Pakistan has adopted a system of 'bonus' vouchers where 20 to 25 percent of bonus is allowed on the tobacco exported. This system puts tobacco exporters of Pakistan in an advantageous position over the Indian exporters. Besides this, India has to face an uphill task in the event of Southern Rhodesia's entry into the world market and the lifting of trade embargo on tobacco. In such case exports to U.K. may decline considerably. The countries which are competing with India in the tobacco market are in an advantageous position because of higher yield per acre, modern machinery for handling tobacco such as tipping and threshing machines and most up-to-date redrying equipment.

Of the varieties of tobacco grown in the state, high grade Virginia goes to indigenous cigarette making or abroad, while the low grade varieties as well as the waste which are available in large quantities have not been put to commercial use. The state offers a good scope for exploiting the same profitably for the manufacture of nicotine acid much needed

¹. Ibid. p.5.
by the pharmaceutical industry. In fact insecticides obtained from the natural materials are less harmful than synthetic insecticides, as the former do not create the problem of harmful residues.

Suggestions:

It is beyond doubt that there has been a steady fall in the export of tobacco from this country. In the light of the existing circumstances and to put the tobacco industry on sound footing, the following suggestions are made:

1. It is in the fitness of things that the government comes out with a policy to boost exports.
2. Certain concessions should be given to the exporters to enable them to compete in the world market.
3. The government should fix the targets of exports every year, after studying the trends in the other exporting countries.
4. The government should fix the prices to be paid to growers before the stocks are put into the market with consultation of exporters, growers and trade associations.
5. The government should encourage the formation of cooperatives both at farmers as well as exporters level by offering certain concessions.
6. The government should study the feasibility and profitability of introducing new methods of 'plant position grading' in place of the existing 'colour grading'.

7. The government should arrange periodic study tours to different countries to understand the problems connected with the tobacco trade and industry in the right prospective. Representatives of growers/farmers, traders and exporters should be selected and sent. A top official connected with the tobacco industry or research may be sent as secretary or leader of the team.

8. The achievements made at Research Stations and Institutes are not reaching the growers at farm level. Every effort should be made to pass on the modern techniques and knowledge to the farmers. The services of the field staff should be made available to the growers mainly to the marginal farmers.

9. The government should examine the possibilities of modernisation of the machinery and other equipment in the tobacco industry.

10. Industries based on the utilisation of tobacco waste and low grade tobacco should be encouraged.

But we cannot expect the government to solve all the problems starting from the grower to the exporter. It is, therefore, necessary that everyone connected with this export oriented industry should contribute their due share to put it on the right track. At one of the meeting of Tobacco Export Promotion Council held at Madras, the chairman rightly stated "considering all circumstances together I feel confident the
tobacco trade can continue to have its accustomed share of the world market, with a little extra effort which is not beyond its capacity.¹

¹ Report of the Wage Board for the Leaf Tobacco Industry, Govt. of A.P. op. cit. p.4.
PART IV

CASHEW INDUSTRY

The origin of cashew tree can be traced to North Brazil; it was first introduced some 400 years ago by the early Portuguese missionaries for checking soil erosion on the coast. The cashew tree is drought resistant adaptable to different kinds of soils and thrives under a variety of climatic conditions. It flourishes in well-drained soil and warm humid climate. But a horticulture soil preferably deep loam with adequate moisture and drainage is ideal for cashew cultivation.

The economic importance of this crop had been realised in course of time and today it has a prominent place in the exports from India. India started exporting cashew kernels shortly after the First World War. Export raised steadily from a few thousand tonnes to 52,293 M.T. in 1973-74 earning a foreign exchange of Rs.74.43 crores.

India has also exported 3845 M.T. of cashewnut shell liquid (C.N.S.L.) valued at Rs.49.61 lakhs during 1973-74. Our principal buyers are U.S.A., U.S.S.R., U.K., Eastern Europe, West Germany, Australia and Canada. Export earnings

1. 'Export of Cashew Kernels from India', The Cashew Export Promotion Council, Cochin- p.5(cyclostyled)
from cashew can be compared favourably with some of the better known traditional commodities like Jute, textiles, tea and paper. Cashew kernel is India's second largest dollar earner.¹

In India, cashew is grown in a variety of soils and climatic conditions, but grown extensively in Kerala, Karnataka, Tamil Nadu, Goa, Andhra Pradesh and Maharashtra. In recent years the same has been introduced in a few places like Orissa, Assam, Bengal and Andaman and Nicobar Islands.

Cashew is one of the world's most delicious wholesome food stuffs. They are full of vitamins, have good measures of organic iron, calcium and phosphorous.² Cashew Kernel is considered as an ideal snack item in many foreign countries. It is also used widely as a flouring medium in the confectionary and baking industry.

India is foremost in processing raw nuts. From being a very small cottage industry the processing has developed into a highly organised labour-intensive industry.

In the recent past, attempts have been made by other cashew growing countries viz. Tanzania and Mozambique to put up highly mechanised plants. Even though they follow the traditional steps in the processing, these modern mechanised plants are intended to maximise the quality of whole kernels

² Indian cashew grades, The Cashew Promotion Council, Cochin.
and recovery of CNSL. The technological advances made in other countries, and the recent fall in exports of cashew kernel from India, has created a position where we have to review our activities and plan for a more profitable future course of action.

The first and foremost thing is to step up production of raw nuts in India. All these years we have been importing a substantial quantity of raw nuts from African countries for processing purposes. Since these countries are now establishing the processing units of their own, the supply of raw nuts may diminish. Even though India occupies a very prominent position in the world market in cashew kernels, we should not forget that the present requirements of this industry to a large extent are met by imports of cashewnuts for its very existence. Under these circumstances there is an urgent need to increase internal production of cashewnuts.

For the Fifth Plan, the assured base level in respect of cashewnut production is fixed at 2.10 lakh tonnes. The Fifth Plan target is to raise the level of production to 2.80 lakh tonnes by the end of 1978-79. It is estimated that the total requirement of raw nuts by 1980 will be about 4.4 lakh tonnes and then our entire requirements may have to be met solely from our internal production and towards this goal.

our production programmes have to be formulated and implemented. It means that there will still be shortage of raw nuts of over one lakh tonnes for indigenous consumption as well as for export requirements. This shortage, therefore, has to be met by imports.

**Cashewnut shell liquid (CNSL)**

The cashew shell liquid, as the name implies is the liquid contained in the shell of the cashewnut. The shell of the cashewnut ordinarily about 1/8" thick, comprises of a soft honeycomb structure inside, containing the dark, reddish brown, viscous liquid known as the cashewnut shell liquid. This liquid is the pericarp fluid of the cashewnut. It is extracted from the shell of the cashewnut, while roasting the nuts. The liquid is thus obtained as a byproduct of the cashew industry.

The cashew shell liquid consists chiefly of the two naturally produced phenolic compounds viz., anacardic acid (about 90 percent) and cardol (about 10 percent).²

The practice of roasting adopted by most of the processing units, specially in Andhra Pradesh does not provide for recovery of most valuable shell liquid which has innumerable industrial uses. Of late the importance of this versatile liquid has been realised, and more processing units are now coming up to make use of this product of cashew industry.³

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2. The Cashew Export Promotion Council, Ernakulam, Cochin.
3. Ibid.
Cashewnut shell liquid is used in the manufacture of a variety of products such as resins, condensation products, colours, dye bases, plastic material, reaction products, water proofing material, electrical insulation material, adhesives, phenols, ether, coating materials, hydrogenated cardanol, polymcrised cardanol, laminated products, rubber like predicts, floor covering material, insecticides, mineral oils, dyestuffs, etc. The Export Promotion Council has published a comprehensive collection of patents covering the use of cashewnut shell oil in two volumes. The first volume covers patents in the U.S.A. and the second volume deals with the patents in U.K. Japan and India.

Cashew husk or skin of kernel (Testa)

Cashew husk or skin obtained during peeling of cashew nuts kernel can be used in the manufacture of chicken feed. The composition of testa is said to contain high tannine and fibre content. Cashewnut testa, if made available in large quantities, may be used in the manufacture of commercial tanning extract. Efforts should be made to popularise the use of this material, which is now being put to no use.

Cashew Apple

Cashew apple is richly coloured, yellow or red. It is consumed either in the raw or wasted. Rotten or damaged cashew apples are also used as cattle feed. Cashew apple was hitherto considered as a waste material of no industrial significance. In the recent past, the usefulness of this material has become
known and the same can be used in the manufacture of 'Cashew Apple Juice', 'Cashew Apple Syrup', 'Cashew Apple Jam', Fruit Chutney', 'Curried Vegetables' Clarified Juice', 'Cloudy Juice', etc. In Goa, this apple is used to produce an alcoholic drink known as 'Feni' on cottage scale. The Central Food Technological Research Institute at Mysore has developed a process to manufacture wine and brandy from these fruits. Efforts should be made to popularise this fruit, which has immense potentialities for industrial use, and may also bring additional income to the farmers.

This fruit being of a seasonal nature, available for a short period during the year, unless the juice concentrate is made and stored for a longer period, the industry cannot use of this fruit commercially. In preservation special attention is to be paid in respect of colour and retention of flavour. Due to highly perishable nature of the cashew fruit(apple) and its prolonged harvest full utilisation of apple is posing a problem.

**Cashew Cultivation in Andhra Pradesh:**

Cashew is grown mostly in the sandy coastal belt of Andhra Pradesh. The cultivation is confined to Srikakulam, Visakahapatnam, East Godavari, Guntur and Prakasam districts. Cashew is also grown in the reserve forest areas.

In Andhra Pradesh cashew was grown in 21,922 hectares during 1972-73. During 1972-73, 18,425 tonnes of cashew nuts were produced in the state.

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Table showing the production and value of Cashew output in Andhra Pradesh.

**TABLE No. 30**

<table>
<thead>
<tr>
<th></th>
<th>1972-73</th>
<th>1971-72</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cashewnuts (tonnes)</td>
<td>18,245</td>
<td>18,168</td>
</tr>
<tr>
<td>Total value of output at current prices (₹ in lakhs)</td>
<td>351.24</td>
<td>343.56</td>
</tr>
<tr>
<td>Total value of output at constant (1960-61) prices (₹ in lakhs)</td>
<td>135.47</td>
<td>133.58</td>
</tr>
</tbody>
</table>

**SOURCE:** Season Crop Report, 1972-73, op.cit., p. 45.

Schemes for the development of cashew were first initiated in the state during the second Five Year Plan. Under the schemes 3,971 hectares of land under forest department were brought under cashew cultivation at a cost of 6.30 lakhs. The development schemes implemented during the Second and Third Five Year Plans were mainly for increasing the area under departmental plantations. However little attention was paid to increase the area under non-departmental areas through disbursement of loans and supply of planting material at subsidised cost.

Progress made under cashew development programme during the Fourth Five Year Plan in Andhra Pradesh can be seen from the table below:

**TABLE No. 31**

<table>
<thead>
<tr>
<th>Target for Fourth Five Year Plan</th>
<th>Achievements during Fourth Five Year Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical (Hectares)</td>
<td>Financial (₹. in lakhs)</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>1. Non Departmental:</td>
<td></td>
</tr>
<tr>
<td>a) Area expansion</td>
<td>Nil</td>
</tr>
<tr>
<td>b) Maintenance</td>
<td></td>
</tr>
<tr>
<td>2. Departmental:</td>
<td></td>
</tr>
<tr>
<td>Area expansion</td>
<td>255</td>
</tr>
</tbody>
</table>

**SOURCE**: Cashew Development Annual Programme, 1974-75; Directorate of Cashew Nut Development, Cochin, p.3.

**Cashewnut Development Scheme**:  
This scheme was first sanctioned for a period of two years i.e. till the end of March, 1960 and subsequently extended from year to year till the end of February 1963. The object of the scheme was to increase the cashewnut production by granting long term loans to landed cultivators at the rate of ₹. 100 per acre up to a maximum of ₹. 2,000 per individual for raising orchards. This scheme was launched to step up the area and production of cashewnut in order to make the country self sufficient in raw cashewnuts required to feed various processing factories and also to sustain
India's monopoly in the internal cashew trade.

The cashew research station at Bapatla (A.P.) has conducted studies regarding cashew cultivation, viz., Varietal studies for economic characters like tree size, yield in terms of nuts per tree, nut size, shelling percentage etc., with a view to spot out the best performance so that the same can be propagated and given for large scale planting.

Programme for work during the Fifth Plan Period:

State Sector Schemes: (Prepared by the Government of A.B)
The proposals for cashew development programme for the Fifth Plan period under the state sector are given below:

**TABLE No. 32.**

<table>
<thead>
<tr>
<th></th>
<th>Target for the Fifth Five Year Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physical (hectares)</td>
</tr>
<tr>
<td><strong>(I) Area Expansion</strong></td>
<td></td>
</tr>
<tr>
<td>a) Non departmental</td>
<td>Nil</td>
</tr>
<tr>
<td>b) Departmental</td>
<td>6,000</td>
</tr>
<tr>
<td>c) Distribution of Planting material (25 ha)</td>
<td>5,000 (air layers)</td>
</tr>
<tr>
<td><strong>(II) Maintenance</strong></td>
<td>15,000</td>
</tr>
</tbody>
</table>


Cashew Development schemes under central sector:

The central sector has launched schemes for setting up cashew development corporations to look after the development of cashew in departmental areas. Under this sector the state governments of Karnataka, Goa, Andhra Pradesh, Tamil Nadu and Orissa are to set up state cashew development corporations in order to intensify efforts, to increase cashew production and also to take up large scale coverage of the existing plantations under a package programme. Such corporations will be under the joint control of state and central, in which central participation will amount to a share of 51 percent of the capital. The Planning Commission has earmarked an outlay of Rs.200 lakhs under this sector to meet the required share capital by the centre.

It is pertinent to mention here that in view of the development of various varieties of plantations like coffee, pepper, cocoa, rubber and cashew in the state, it will be desirable to set up a separate corporation to bring into fold all these plantation crops. At present the cultivation of cashew by the forest department is mostly confined to forest areas. Being limited in area and scope, the setting up of a corporation exclusively for the development of cashew may not bring the desired results. Hence a plantation corporation to cover all the plantation crops will bring manifold advantages.
PART V

SAKO AND STARCH INDUSTRY

INTRODUCTION:

Tapioca is native to South America and the origin of this plant can be traced to Brazil. It grows in tropical countries and yields considerable quantity of tubers rich in starch. It was introduced in India in 1840 and concentrated mainly in Kerala, Tamil Nadu in the South and Assam in the North East region of the country. In Andhra Pradesh, for a long time it was cultivated in forest and upland areas in a limited way intended for local human consumption. In recent years its industrial use as a raw material for the manufacture of Sago and starch has resulted in the establishment of a large number of Sago and starch manufacturing units. Consequently the area under cultivation of tapioca has gone up in Andhra Pradesh mainly in the East Godavari District.

Soil:

Tapioca can be grown on any soil if it is well drained. If no other crop can be grown in a particular soil, Tapioca can be grown there, however inferior it may be. But good creation is most essential for proper root development. The plant is drought resistant and also can withstand heavy rainfall even up to 100" but cannot bear water stagnation around the plant.
Uses of Tapioca:

The tuber is used as an item of food like potato chips. Starch manufacture from tapioca is used for the sizing and finishing operations in textile-mills, for manufacturing Dextrine Alcohol for automobiles, cosmetics and in the manufacture of Glucose and biscuits. It can be mixed with wheat flour for making bread, chapatties and puries. Mixing of at least 10 percent of Tapioca flour in the manufacture of bread etc. has been statutorily made compulsory in Cuba. It is also used in Veneer industry in the manufacture of adhesives and gums. By converting into sago balls and flakes, it is used for human consumption. Tapioca can be treated not only as food crop but also as a commercial crop. In these days of food shortage it can be a good substitute food crop in the drought-hit, dry and upland areas. It can be termed as "poor man's rich food" due to high nutritive value. Besides Sago and starch, several other items like flour, Suji, macaroni and synthetic rice, cattle feed can also be made from tapioca.

Cultivation of Tapioca in Andhra Pradesh:

The cultivation of tapioca in Andhra Pradesh is showing an upward trend. In the recent years, there has been sudden increase in the cultivation of tapioca leading to
marketing problems as the tuber is sold only to the manufacturers of sago and starch. Direct human consumption is strictly limited. This sudden rise in the supply position has resulted in a downward trend in prices of sago and starch in the country. The cultivators complain that it is the manufacturer who is responsible for this state of affair and he is being exploited by the manufacturer by offering unremunerative price for tapioca.

East Godavari District stands first in the state for the cultivation of tapioca in 2,762 hectares (1972-73) as compared to total cultivated area of 4,393 hectares in the state. The yield is also very high in the coastal Andhra region. The increase in area in the East Godavari district in 782 hectares when compared to the preceding five years average. It is estimated that the present net area under cultivation of tapioca is said to be around 25000 acres in upland areas of the district. There are two varieties of tapioca. Bombay variety is commonly grown in these parts, while the Kerala variety is confined to South.

Cost of Cultivation:

The estimated cost of cultivation of tapioca (under rainfed cultivation) per acre is analysed under different heads in the following table:

1. District Collector's note Collectorate, East Godavari district, Kakinada (A.P.)
The cost of cultivation of tapioca tuber in East Godavari district.

<table>
<thead>
<tr>
<th>TABLE - 33</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Preparatory Cultivation</td>
</tr>
<tr>
<td>(Under rainfed cultivation)</td>
</tr>
<tr>
<td>3 ploughings @ Rs.6 per plough (3 times)</td>
</tr>
<tr>
<td>3 men @ Rs.3 (three times)</td>
</tr>
<tr>
<td>Levelling of land</td>
</tr>
<tr>
<td>II. Seeds &amp; Sewings</td>
</tr>
<tr>
<td>Cost of 5000 sets (i.e. 2 M.Ts) of seed material at Rs.100/- per m.tonne</td>
</tr>
<tr>
<td>Planting sets 12 women @ Rs.3/- and 2 men @ Rs.3/- (2 times)</td>
</tr>
<tr>
<td>III. Process of seed materials</td>
</tr>
<tr>
<td>Irrigation - pot watering twice at interval of 10 days each time</td>
</tr>
<tr>
<td>10 men and 10 women @ Rs.3/- each.</td>
</tr>
<tr>
<td>IV. Manures &amp; Manuring</td>
</tr>
<tr>
<td>50 kg urea</td>
</tr>
<tr>
<td>50 kg 17:17:17</td>
</tr>
<tr>
<td>V. After cultivation</td>
</tr>
<tr>
<td>4 weedings and hoeings (20 women @ Rs.3/-)</td>
</tr>
<tr>
<td>VI. Harvesting</td>
</tr>
<tr>
<td>20 men @ Rs.5/-</td>
</tr>
<tr>
<td>Processing of produce (4 women and one man @ Rs.3/- each)</td>
</tr>
<tr>
<td>VII. Marketing</td>
</tr>
<tr>
<td>Transport cost - S.M.Tonnes @ Rs.15/- per M.T.</td>
</tr>
<tr>
<td>Total Expenditure</td>
</tr>
<tr>
<td>Or Say</td>
</tr>
<tr>
<td>VIII. Yields 8 M.T. @ Rs.300/- per M.T.</td>
</tr>
<tr>
<td>IX. Net Profit (2400-1200)</td>
</tr>
</tbody>
</table>

Source: Deputy Director of Agriculture, East Godavari District, Kakinada, A.P.
A brief history of Sago and Starch Industry:

Tapioca is the raw material used for the manufacture of sago-balls and starch. The manufacture of starch from tapioca in India dates back to the war period when the supply of tapioca starch from Malaya and Java was stopped due to Japanese occupation. The entire demand for textile mills in India was to be met from Travancore and Cochin. In Andhra Pradesh an humble beginning was made in 1942 on a cottage industry basis. Some entrepreneurs coming from agricultural families visited Kerala and Tamil Nadu States and after making an on the spot study started manufacturing units in the East Godavari district. This was the origin of entrepreneurship in this industry. One of the manufacturers who happen to be the pioneer of this industry and the President of the Andhra Sago Mill Manufacturers Association is a progressive farmer with modern outlook. He said that he started the factory in a backward place (Mallisala) with a view to develop the area. He also said that he is a follower of Gandhian philosophy. He himself is a cultivator of Tapioca. Before he took up manufacturing side, he visited Tamil Nadu and Kerala states for 15 days and studied the working of the different units and virtually brought the seedlings from Kerala and made a humble beginning (in his own land) in few acres and gradually expanded it and other farmers followed his example and started raising it. This was the beginning of
the industry as well as cultivation in the district. At the beginning he employed local labour and gave them necessary training. He says that he also invited 70 to 75 labour families from Srikakulam and Visakhapatnam districts and gave necessary training. He says that Skin (outer layer) can be used for cattle feed but care should be taken to feed it in limited quantities. The Skin also can be used as manure. He is of the opinion that there will be growth in the crop but not much in the yield. Most of the Millers are not utilising this waste material for any useful purpose. He is of the opinion that during these days of good shortages we can bank on tapioca- Sago to met the food shortage. He expressed his intention of arranging an exhibition to popularise the use of tapioca as food to the public. Electricity was not supplied to Mallisala, even after 10 years of the establishment of the factory. The factory is run by oil. Even for repairs one has to get a person from Samlkot which is 5 K.M. from Mallisala.

Manufacture of sago on large-scale basis involves the following process.

1. Peeling of skin of the tubers
2. Washing the tubers
3. Crushing of Tuber and extracting starch milk.
4. Filtering of the milk and sedimentation.
5. Crushing the sedemented cakes into powder.
6. Pellet making
7. Slevation of sizes.
8. Frying of pellets.
9. Drying of pellets in hot sub.
11. Packing

**Features of the Industry:**

1. Labour oriented: About 250-300 labourers are employed in a unit per day during the season for peeling work.
2. Not much skill is required: One can learn the art of peeling in a short span of time.
3. Raw material is the key factor which is available locally.
4. Seasonal Industry: Normally a unit works for 6 months in a year.
5) The machinery is indigenous and fabricated locally.
6. Pure and regular supply of water is essential.
7. The industry has been brought under the perview of Central Excise recently, wherever the number of workers exceed 50.
8. Regular supply of Electricity is essential for the tuber has a tendency of losing weight. All the sago and starch manufacturing are located in rural areas in the road side fields where electricity and water are available. In a way these industries are providing employment opportunities in the season for the agricultural labour and indirectly helping in dispersal of industries in rural areas.
9. Fire wood which is required for frying purpose is available from the forests of the district.

10. Gunney bags are used for packing purposes.

The position of Sago/Starch manufacturing industry in East Godavari district in 1975.

**TABLE - 34**

<table>
<thead>
<tr>
<th>Particulars of units</th>
<th>No. of units</th>
<th>In Existence</th>
<th>Under implementation</th>
<th>Regis- tered</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sago Factories</td>
<td>27</td>
<td>5</td>
<td>2</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Sago and Starch factories</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Starch Flour Mills</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41</strong></td>
<td><strong>13</strong></td>
<td><strong>18</strong></td>
<td><strong>62</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Data collected from the Registrars and other records of the Office of the Deputy Director of Industries, East Godavari district, Kakinada.

The number of Sago/Starch flour units is increasing from year to year. There has been a sudden increase in 1973-74. At the time of survey there were 9 units working and one unit under implementation at Vetlapalem of Kakinada taluk in East Godavari district.

The following table gives a clear idea of increase in number of units. The number of units are arranged in chronological order basing on the date of their registration.
Table showing increase in number of Sago/Starch/Flour units in East Godavari district.

<table>
<thead>
<tr>
<th>Year</th>
<th>Proprietary concerns</th>
<th>Partnership firms</th>
<th>Private Limited Company</th>
<th>Total</th>
<th>Progressive Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to 1971</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>1971</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1972</td>
<td>-</td>
<td>9</td>
<td>-</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>1973</td>
<td>5</td>
<td>23</td>
<td>-</td>
<td>28</td>
<td>38</td>
</tr>
<tr>
<td>1974</td>
<td>10</td>
<td>11</td>
<td>1</td>
<td>22</td>
<td>60</td>
</tr>
<tr>
<td>1975</td>
<td>1</td>
<td>11</td>
<td>-</td>
<td>2</td>
<td>62</td>
</tr>
</tbody>
</table>

N.A.: Not available

Source: Complied by the author from the records of the Deputy Director of Industries Office, East Godavari district, Kakinada.

The magnitude of the industry can be understood from the fact that about ₹ 2 crores have been invested in this industry providing employment to about 9,000 persons for 100-120 days in a year.

It is estimated that this crop (tapioca) is raised in about 25,000 acres with the yield to be in the order of 1,25,000 M.Tones providing employment to several thousand agricultural labour in rural areas. The present crushing capacity in the existing units is about 96,000 M.Tonnes per annum. Thus it is clear that the supply of tapioca is more than the demand.
even after allowing some margin for flour production.

The price of tapioca during 1973-74 ranged between Rs.80 to 120 per "putty" i.e. 226 kg. while the price during 1974-75 has come down to Rs.20.35 per 226 kg. This is due to extensive cultivation during 1974-75. The problems of the industry are further beset with another factor cited by the millers. It is said that the mills in Tamil Nadu switched over their production from starch to sago because of the fall in demand for starch in the textile industry as shortage of power has effected the working of the textile mills in the country during 1974-75.

Consequently the production of sago in the country has increased considerably making supply more in relation to demand, which again resulted in a steep fall in the prices of sago from Rs.210 in 1973-74 to as low as Rs.145-Rs.148 during 1974-75.

The cost of production of sago per day (i.e.) 40 bags of 90 kg. each is estimated as follows:

**TABLE- 36**

<table>
<thead>
<tr>
<th>Description</th>
<th>1st estimation Rs.</th>
<th>2nd estimation Rs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) For peeling</td>
<td>260</td>
<td>270</td>
</tr>
<tr>
<td>2) Salaries and wages</td>
<td>410</td>
<td>385</td>
</tr>
<tr>
<td>3) Fuel</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>4) Power</td>
<td>140</td>
<td>140</td>
</tr>
</tbody>
</table>

Contd..
v) Depreciation 300 300  
vi) Interest 600 600  
vii) Loading charges per day 10 10  

\[ \text{Total cost of production} = 1,806 + 3,600 + 5,406 = 10,812 \]

Source: Deputy Director of Industries, Kakinada, East Godavari district, (A.P.)

The cost of one bag (90 kg.) of sago produced comes to Rs.135 which goes up to Rs.140 including the cost of gunny bag. The market price per bag (90 kg.) of sago is reported to be about Rs.145-148 which leaves a margin of Rs.5-8 per bag. At this rate the millers are expected to get a net profit of Rs.20,000 per annum which is 4% of the turn over.

Starch and sago are mostly sent to Bombay, Calcutta, Poona, Vijayawada and Guntur and from there to other parts of the country.

In view of the easy method of cultivation of tapioca and a large number of manufacturing units having come up in recent past, we can presume that this industry has any excellent scope for further development. It is suggested that some of the units may diversity their production and can take up the manufacture of adhesives and macrone. Cattle feed compounds can also be manufactured from the waste. The de-dydrated leaves
of tapioca can be used as substitute for Agar Agar in view of their vitamin content.

One unit for the manufacture of liquid glucose at a capital investment of Rs. 7.00 lakhs is coming up at Kakinada.

**Difficulties/Problems:**

In all the six units where survey was conducted it has been stated that the shortage of power supply is the main difficulty which is coming in the way of efficient running. To overcome this shortage almost all the units have installed oil engines for generating electricity. They would be requiring electricity for at least 16 hours per day continuously. They complain that the electricity is supplied only for 10 hours per day and that too not continuously. During the peak season, i.e. January, February and March each factory requires at least 9000 units while in April, May, June 4500 units would be sufficient. For the remaining 6 months electricity will be required only for lighting purposes. Each unit is allotted a monthly quota of electricity by the A.P.S.E.B. The unit exceeding the allotted quota is penalised.

The second problem confronting this industry is the allotment of railway wagons. The entire produce is said to be exported to the Northern parts of India. For want of required number of wagons, some of the units are transporting their products by road, which is very expensive. Where wagons are

1. Ibid, p.33.
are alloted, they are not alloted in time. Since they are marketing their products mostly in far away places like Bombay, Poona, Calcutta, Delhi, Nagpur etc. If required number of wagons are not alloted in time, the units could not be run on sound lines.

In certain places the roads are not well maintained, for example the units located in Mallisala are facing difficulties in transporting their products by road mainly to Korukonda.

Suggestions/Recommendations.

(a) Cultivation of Tapioca:

1) It has been proved beyond doubt that East Godavari district has all the potentialities for the cultivation of tapioca. The recent developments that are taking place in the cultivation practices of tapioca are not reaching the farmer. The experiments and research conducted by the Central Tuber Crops Research Institute, Trivandrum may be made available to the cultivations. Hence there is an urgent need to establish a separate agricultural model demonstration farm in the up land areas of the district where it is presently grown extensively. It will help the cultivation to increase the production as well as productivity.

2) There has been a steady increase of tapioca crop in the district. With a view to protect the farmer from being exploited by the manufacturer, the commodity may be notified under the Andhra Pradesh(Agricultural Produce and Livestock)
Markets Act, 1966 and market yards may be established where tapioca is grown. At present, the cultivators bring the produce to the unit directly where the manufacturer determine the price after examining the quality etc. The cultivator has no say whatsoever in the fixation of price. In some cases, the manufacturer advances money to the cultivator (say ₹200/- per acre) and the price is pre-determined. The cultivator under the agreement has to deliver the produce to the manufacturer at the price so determined earlier but not on the prevailing market price. In order to overcome these difficulties, and to prevent distress sale of tapioca, the cultivator may be encouraged to form Agricultural Marketing Cooperative Societies.

(T) Tapioca based industries:

1) The State Electricity Board may be asked to provide regular supply of electricity during the peak season i.e. January, February and March. In case it is not possible, supply of electricity may be so arranged enabling each unit to run for 16 hours per day on rotation basis.

2) Regarding the supply of required railway wagons, the matter may be taken up with railway authorities. Sago being a food product, wagons may be made available on priority basis as is the case with other food grains.

3) The imposition of 10% ad valorem excise duty on tapioca starch in the recent union budget (1976) is very high and may cripple this cottage/small scale industry since the
small factory owners have neither the ability nor the financial strength to bear the burden. At present, most of the units do not have the pucca godowns to store the produce. The sago manufacturers are unable to move stocks from godowns.

Under the new rule sago factories are required to take out a licence and furnish stock details periodically to the authorities. It is feared even the cattle feed made from the tapioca waste will not be allowed to be moved from the factories by the Excise Officials.

4) As a long term measure, to solve the marketing problems faced by cultivators as well as millers, it is desirable to form cooperative mills with growers and workers. The Government should allow only establishment of such units under cooperative sector for the benefit of all those who are concerned with this industry.

5) Government to prepare a scheme to popularise the sago as food product in the country as well as in Afro-Asian countries with an intention to facilitate exports of sago and starch in particular.

Tapioca based industry namely sago and starch manufacturing is one of the biggest small scale industries of the district. It is seasonal in character and located in rural areas. This is highly labour oriented and helps the dispersal of industries in rural areas. In view of its importance in the economy of the district in particular and the State in
general, the sympathetic outlook of the Government and the incessant efforts of the manufacturers may put this industry on right track. One can visualise bright prospects for this industry.

(c) **Hygienic conditions - I.S.I. Standards**

Above all, most of the sago units are not maintained at a satisfactory level of hygienic conditions. Waste water is let out in the open fields outside the factory. The accumulated water breeds mosquitoes. Efforts should be made to utilise this waste water which is said to be good as manure in the fields. At present this waste water is not put any use. Besides, there is an urgent need to maintain a satisfactory level of hygienic conditions. Keeping in view the fact that sago is consumed by children and convalescents I.S.I has provided certain specifications in respect of sago and for this purpose special standards relating to the code for hygienic conditions for sago units have been published. No unit in the district is following these specifications laid down by ISI nor the code for hygienic conditions. It is therefore suggested that the need to improve the hygienic conditions should be popularised and to maintain the specifications as laid down by the ISI for the healthy growth of this industry.
PART VI

PALMYRA FIBRE INDUSTRY

Origin and Growth:

Palmyra fibre, an important raw material for the manufacture of brushes and brooms, is obtained from the palmyra tree. Palmyra tree is believed to be the native of South Africa. The palm belt in the world roughly extends from 44° south latitude to 45° North latitude spreading in tropical countries like Congo, Burma, Sri Lanka, India, Bangladesh, Indo-china, Indonesia, Malaya and also in West Africa. But fibre is extracted commercially mainly in India. In India it grows in Bihar, West Bengal, Orissa, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka and Maharashtra. Palmyra fibre industry is confined mainly to Andhra Pradesh, Tamil Nadu and Kerala. India's production of palmyra fibre by and large corresponds to world production. The average annual output of 10,000 tonnes in India is concentrated in Andhra Pradesh (59.0 percent), Tamil Nadu (40.0 percent) and Kerala (1.0 percent). The exporting centres comprise of Tuticorin and Colachel in Tamil Nadu, Kakinada and Visakhapatnam in Andhra Pradesh and Calicut in Kerala. Of the total production, the medium staff variety is estimated to account for 70 percent, price stiff 15 percent and soft variety 15 percent.

2. Ibid, p.1
Extracting fibre from Palmyra trees is an ancient industry of India; presently it has great export potential earning foreign exchange over Rs. 2 crores per year. The Khadi and Village Industries Commission has been entrusted with the responsibility of ensuring healthy growth of this industry to strengthen employment opportunities and rural economic development. Palmyra fibre industry is heavily export oriented as more than 90 percent of its output is entering into the overseas markets. Only a negligible percentage of the total production is utilised in our country. No reliable statistics regarding the number of Palmyras utilised for extraction of fibre and the annual output of raw or processed fibre are available.

Description:

Palmyra fibre is extracted from the sheath or bifurcated portion at the base of the leaf stalk of the tree. The harvested leaf-sheath is then split into parts. These pieces are beaten with a wooden hammer to extract the fibre after removal of pith and outer skin. Sometimes water is also sprinkled to facilitate separation of fibre. The beaten sheath fibre is generally known as "Kora". The new palmyra fibre so obtained undergoes further cleaning and processing before it is exported. The quality and price of Kora fibre depends largely upon its colour, stiffness and moisture, etc.

Classification:

The factors taken into account while judging the quality of Palmyra fibre are: colour, length, thickness, stiffness, moisture content and the extent of foreign matter including pith, dirt, dust etc.; of which colour and length are the most important. The fibre is usually classified as black, light brown and white. The colour also indicates to a great extent the index of strength and stiffness. Consequently black fibre is also known as "Prime Stiff", light brown as "medium stiff" and white fibre as "soft". It is the age of the Palmyra tree which largely determines the quality of the fibre extracted.

Therefore all Palmyra trees are not fit for extraction of the fibre. Palmyra palms have male and female varieties. Neera is obtained from the female variety, while the leaf stalks of male varieties are suitable for fibre extraction. The middle aged trees yield strong fibre of dark colour, while the leaf stalks of male varieties are suitable for fibre extraction. The middle aged trees yield strong fibre of dark colour, while the fibre of younger or older trees is of lighter colour and weak.

Trade Description:

Palmyra fibre is usually marketed under two trade descriptions namely (i) Natural length fibre (ii) dressed or dassine (cut length) fibre.
Grading is undertaken on the basis of colour, strength and thickness of the fibre. Graded fibres are designated as "superior", "special ordinary", "Ordinary" and "fair" average quality. The natural graded fibre is relatively in greater demand. The dassine or dressed fibre is graded into "extra stiff", "Superior stiff", "Prime stiff", "medium stiff" and "soft. The grades, however are designated differently in various centres. At Kakinada, the fibre is sorted into four grades viz. "Superior" "Special ordinary", "Ordinary" and FAQ in the descending order of quality. At Tuticorin, three grades are in existence namely "extra-superior", "Superior" and "Ordinary". At Calicut the fibre is traded under the name of "Malabar fibre" only. All the grades fibre is also sorted according to its length. In all centres there are only three grades according to length. The length of each grade, however, varies from centre to centre as can be seen from the table below:

Grades and lengths of fibre at various centres.

TABLE- 37

<table>
<thead>
<tr>
<th>Grade</th>
<th>Kakinada</th>
<th>Tuticorin</th>
<th>Calicut</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. or A</td>
<td>16&quot; and above</td>
<td>15&quot; and above</td>
<td>18&quot; and above</td>
</tr>
<tr>
<td>2. or B</td>
<td>12&quot; to 16&quot; or 14&quot; to 16&quot;</td>
<td>12&quot; to 15&quot;</td>
<td>16&quot; to 18&quot;</td>
</tr>
<tr>
<td>3. or C</td>
<td>5&quot; to 12&quot; or below 14&quot;</td>
<td>Below 12&quot;</td>
<td>7&quot; to 12&quot;</td>
</tr>
</tbody>
</table>

Source: Survey on India's Export potential of palmyra fibre and allied products in U.K., U.S.A. and Japan, Indian Institute of Foreign Trade, New Delhi, op.cit. p.115
There is no standardisation of various grades of palmyra fibre and it is not subjected to any kind of pre-shipment inspection. The exporters expressed disagreement with the Government of India's intention to extend quality control and pre-shipment inspection. They are of the opinion that this idea of extending quality control and pre-shipment inspection is quite unwarranted and uncalled for, as the trade has been smoothly running on for a number of years to the satisfaction of exporters from India and importers in foreign countries. It is further stated that government interference in the smoothly running business will only cause unnecessary delay, loss, hardship and inconvenience with no corresponding benefit or satisfaction to anybody. They argue that there are numerous grades of fibre and the foreign demand varies from place to place. Therefore, fixing of uniform standard will serve no useful purpose.

From the above it is evident that there is no uniformity in the quality of fibre of various grades and with in the grades the quality varies between the various centres. In the villages mostly Harijans and other backward communities scattered over several hundreds of villages generally do not undertake sorting of fibre according to colour or length and the same is disposed off to the village level merchant who in turn move considerable quantity of fibre from rural areas to the brokers at pooling centres of exporters without any sorting.
The market at pooling centres, however, quite often undertakes the sorting activity into black, brown and white fibre. Fibre of longer length is also separated from shorter one. Each lot is separately banded and passed on to the exporter. The exporters have their own units where final cleaning, grading, handling and packing operations of the fibre are undertaken. It is a weight losing commodity.

To suit the tastes of individual importer, the fibre is cut into various sizes ranging usually from 5 cm. to 45 cm. Fibre is also dyed dark brown and red for special purposes. It is interesting to note that every exporter has his own conception about the quality. This is not desirable as it may affect the regulation of Indian palmyra fibre industry in the long run.

Uses:

Brushes and brooms are the chief and products of palmyra fibre. Palmyra mats are used generally for packing purposes. Brushes and brooms manufactured with palmyra fibre are utilised mostly for household cleaning and in industries. The shape, size and material of the brushes vary in accordance with the use to which it is put. It is mainly used for floor cleaning, street cleaning, drain, lavatory cleaning etc. It is said that besides manufacture of brushes, the fibre is being used in some countries for making roofing sheets or false ceilings for theatres. Industrial uses of brushes are many. Scrapping brushes for buildings and roads, paints and
varnish brushes and jewellery cleaning brushes are also in demand. A special variety of brushes for painting and lettering purposes can also be made with palmyra fibre.

**Brush making industry:**

Brush is simple cleaning equipment consisting of a wooden board and filling materials of animal, vegetable or man-made fibres. Brush making industry is well advanced in U.K., U.S.A., Japan and West European countries, whereas in India it is still in its infancy.

The data on production of palmyra brushes and brooms in the country is not available. It is however estimated that the total production is of the order of Rs.10 lakhs of which Cooperative Societies in Tamil Nadu account for about Rs.20,000. The rest originates from small/cottage industries in U.P., Delhi and Maharashtra.

With palmyra fibre, different types of brushes are made in India like drain cleaning brushes, laboratory brushes, deck scabbing brushes, hand brushes, scrubbing brushes etc. The important centres are Calcutta, Bombay, Kanpur, Agra, Delhi, Palghat etc.

The palmyra fibre is used in Telangana districts of Andhra Pradesh for rope making for domestic purposes.

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**Palmyra fibre industry in Andhra Pradesh**

In Andhra Pradesh this industry is known to be in existence mainly in Kakinada for more than 100 years. The chief reason for the development of this industry at Kakinada is the existence of shipping facilities for exports to other countries of the world. Availability of skilled labour, proximity of raw material and the patronage of the experienced and enthusiastic entrepreneurs are the other factors which contributed for its concentration at Kakinada.

Jagannaickpur in Kakinada is the nucleus for the operation of various processes of this commodity. Most of the businessmen are engaged in this industry more or less on a hereditary basis. Lucrative earning, of course, is the main guiding factor.

Palmyra trees which yield fibre are found throughout the coastal districts of Andhra Pradesh. However, the trees are thickly concentrated in the East Godavari, West Godavari, Visakhapatnum and Srikakulam districts.

Families of tappers, Harijans and other backward classes constituting the weaker section of the community are engaged in the industry of extracting fibre from palmyra trees. Generally the tree owners collect a rent of ₹0.50 per tree for cutting the sheath or bifurcation portion of the base of the leaf stalk of the tree. The palmyra leaves that are cut will be taken by the owner of the tree. The tappers or the persons who undertake the extraction of fibre are allowed to take the sheath on payment of rent but not the other parts of the tree.
Andhra Pradesh Palmgur Co-operative federation Ltd.

The Andhra Pradesh State Palmgur Cooperative Federation Ltd. is an apex organisation which was established in 1959 to take up the responsibility of developing palmgur and palm products industry in the state. The federation's area of operation has been extended to the entire state and its headquarters are located at Nidadavole in the West Godavari district. It has 548 members on its rolls. The authorised capital of the federation is Rs. 5 lakhs, while its paid up share capital is Rs. 2,12,850 (excluding the state government contribution of Rs. 2 lakhs). With the lifting of prohibition in the state and consequent to the restriction on the concessions to tap trees for manufacture of palm Jaggery, the federation has lost its business. This resulted in a shift in the activities of the federation to processing of palmyra fibre in the modest way with the limited finances made available by the Khadi and Village Industries Commission. Till the end of 1973, the federation has received Rs. one lakh as short term working capital for undertaking palmyra fibre trade. The federation has also prepared a scheme to strengthen the fibre trade and sent the same to the Khadi and Village Industries Commission for its approval which requires about Rs. 4.5 lakh towards working capital. The federation has three processing units at Nidadavole, Madhavaram in West Godavari district and Mummidivaram in East Godavari district. The
federation, so far, trained 83 persons in the art of processing fibre with the financial assistance granted by the K.V. Industries Commission and the Government of Andhra Pradesh. Of these, 70 persons have been absorbed in the processing centres of the federation. There is scope for extending the activities to other areas where such facilities are not available. The federation could not extend its activities and enter into the export trade in a big way due to paucity of funds, shortage of godowns, work sheds etc.

Exporters who bought processed fibre from the federation previously are coming forward to offer higher rate, since the federation has been maintaining high standards of finished fibre. With the experience it has gained in trading of palmyra fibre internally, the federation can take up direct exports to foreign countries. In case the required finances are made available by the Khadi and Village Industries Commission and by the state government, the federation can go a step ahead and participate in the export trade activities.