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PROBLEMS EXPERIENCED IN THE OILSEED  
AND VEGETABLE OIL PROCESSING INDUSTRY 1/

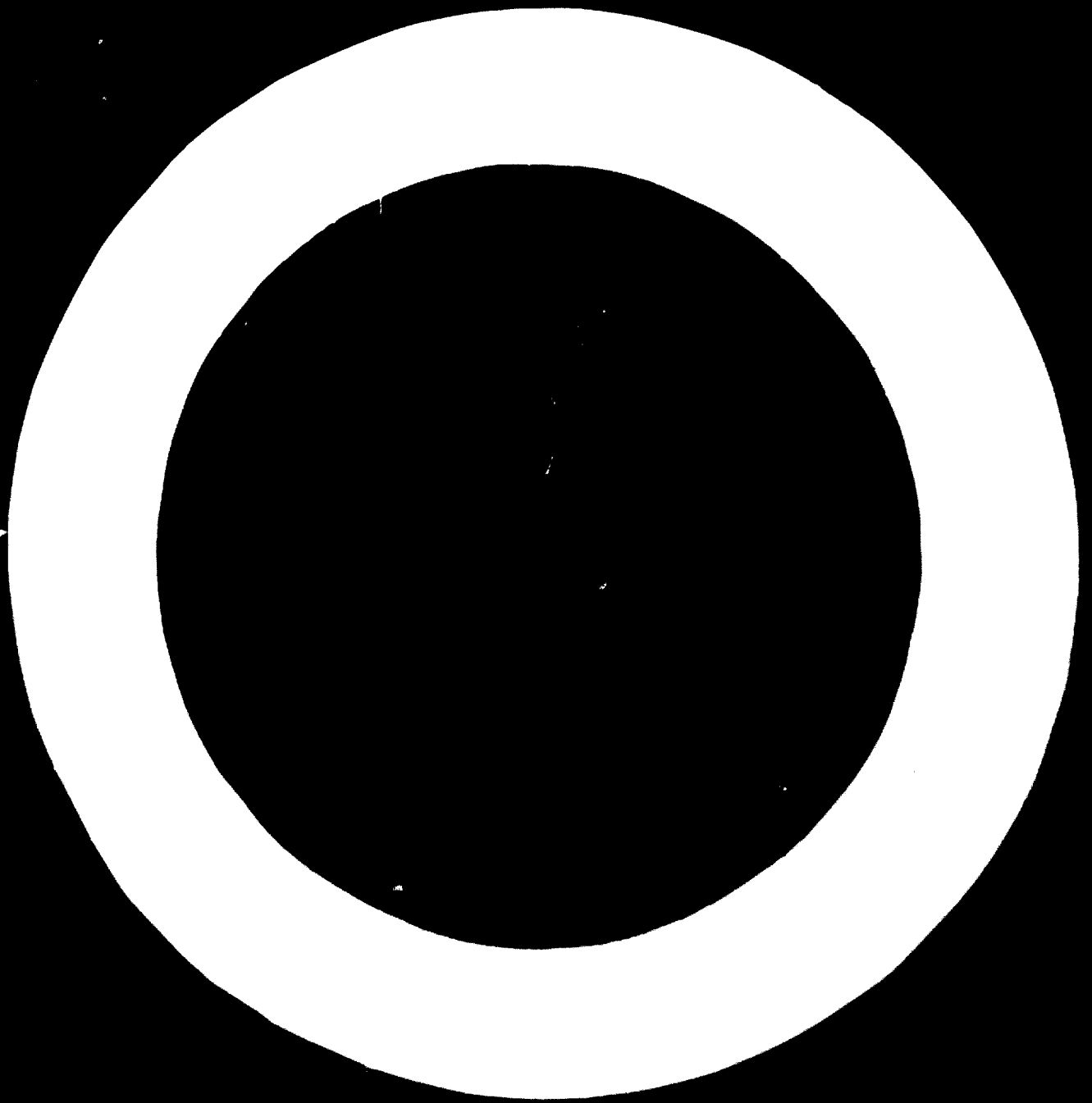
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This paper will deal with the Vegetable Oil Production Industry in Ghana, outlining the present processing methods both mechanical and traditional, and spell out some of the main problems. The cultivation and procurement of the oil seeds for the processing units will also be discussed.

## S U M M A R Y

1. The Vegetable Oil Seeds that can be cultivated and processed in Ghana are - in the order of size and economic value - Palm Fruit, Coconut, Groundnut, Palm Kernel, Shea-nut and Cotton-seed. Rice-bran is a possible addition.
2. Palm fruits are, in the main, harvested from wild-growths; cultivation on the modern plantation basis is a comparatively new enterprise, with a total acreage of about 20,000 planted.
3. Coconut palm trees are grown extensively in small-owned plantations. Institutional plantations are currently being developed, and over 20,000 acres will be planted within the next ten years.
4. Palm Kernel collection is poorly organized and does not therefore make them adequately available for industrial exploitation.
5. Groundnuts, even though grown in fairly large quantities, are planted generally as a second crop on the farms. Cultivation on large commercial basis is rarely undertaken.
6. The cultivation of palm-trees, coconut palm and groundnuts is not yet adequately supported by modern agricultural techniques, with the result that yields are comparatively low. Improved seedlings with high yielding potential are not abundantly available for planting.

SUMMARY (CONT'D)

7. (a) Trees which yield nuts for processing into shea-butter grow wild on very extensive scales. Their exploitation for industrial and commercial advantages is yet to be undertaken.  
(b) Cotton-seed production is in its infant stage, but it is estimated that reasonably large quantities will be available for commercial processing by the end of the next 4 years.
8. For all three oil-seeds - palm fruit, coconut and groundnut - there is very substantial direct human consumption of the harvests, and consequently, only small quantities become available for oil extraction.
9. There is considerable oil extraction by traditional methods which are generally wasteful in terms of oil recovery efficiency and cake yield. Consequently, industrial plants for mechanical processing are not adequately fed with raw materials.
10. Financing of raw material purchases is irregular and expensive, and thus adversely affects the purchasing efforts of the processing Mills.
11. Industrial plants are further hampered in their operations by inefficient equipment performance and inadequacy of skilled manpower. Due to foreign exchange problems, much-needed spare parts are normally not on hand at the right times for the repair of machinery break-downs.
12. The domestic market demand for vegetable oils, both for house-hold consumption and industrial uses, far outstrips production, and this situation shows no sign of immediate improvement.

## CHAPTER 1 - INTRODUCTION

- 1.1 There are a number of oilseeds which can be cultivated and processed into oils and cakes in Ghana. These are, in the order of their economic value - palm fruit, coconut, groundnut, palm-kernel, shea-nut and cotton seed. Rice-bran is a possible addition with the extensive cultivation of rice plantations now being undertaken.
- 1.2 Palm trees are grown mainly in the forest belts - originally they grew wild, but lately, they are being cultivated in organised plantations. Palm-fruit processing for palm-oil is undertaken mechanically by a State Organisation - the State Farms Corporation - which grows its own plantations. In the wild-growing areas, the local people use traditional methods of extraction both for the palm-oil and palm-kernel oil.
- 1.3 The Coconut palm is grown extensively along the coastal areas, and is processed mechanically by another State Agency, the Vegetable Oil Mills Division of the Ghana Industrial Holding Corporation (GIHOC), and a private Company, the Crystal Oil Mills Limited. There is substantial traditional processing as well.
- 1.4 Groundnuts are grown in the savanna areas, notably in the Northern and Upper Regions, and processing is undertaken traditionally in these areas by women. Mechanical processing is undertaken by the Vegetable Oil Mills Division of GIHOC.
- 1.5 Shea-nut trees grow wild in the North and Upper Regions, and only very little processing of the nuts for oil and butter is undertaken through traditional methods.



1.6

Cotton-seed is the newest addition to the range, but its cultivation in the Northern, Upper and Volta Regions is now being developed. No oil processing takes place yet but the Vegetable Oil Mills Division have it on the priority list.

1.7

With a number of Rice Mills now being established to process paddy rice, large quantities of rice-bran can be expected to be made available in the near future for oil extraction, but the possibilities are yet to be studied.

It is now proposed to discuss each oilseed - its cultivation and processing - in order to outline the key problems arising.

## CHAPTER 2 - PALM FRUIT

2.1

The cultivation of the oil-palm on the large scale plantation basis is a comparatively new enterprise. The State Palms Corporation has been spear-heading this enterprise since 1957, and it now has 20,000 acres all planted with improved seedlings, with a little over 15,000 acres in their initial yielding stages. There are a number of private plantations also planted with improved seedlings scattered over the forest belt, but these are of small acreages and individually owned. It is estimated that there are about 8,000 acres in total of such small plantations, with about 5,000 in the initial yielding stages.

2.2

In addition to these modern plantations, there are areas of sub-sidiary plantings and spontaneous growths along the coast and the middle forest belts, predominantly in Ashanti and the Brong-Ahafo regions. It is estimated that there are about 250,000 acres of such trees, with about half of them yielding at the very low rate of 1 to 2 tons per acre. In the spontaneous growth areas, the trees and fruits are used for two main purposes - (a) tapping of palm wine and (b) picking of the bunches for direct consumption or traditional extraction. The tapped trees, of course, die away with the felling.

2.3

The yield is currently about 2.8 tons per acre for the modern plantations, which is far below the expected yield of 6 to 8 tons per acre. The main reasons assigned for this comparatively low yield are: (a) The lands are only marginally suitable for cultivation. In most areas, rainfall is just about the minimum 60 inches per annum required.

- (b) Fertilizers are normally not employed, and the natural qualities of the soils are therefore not improved.
- (c) The maintenance of the plantations is unsatisfactory. In a number of cases, patches of plantations have been allowed to overgrow with weeds. In the case of the privately-owned small plantations, the poor care of the farms is the result of lack of adequate funds to pay the costs of labour, and the disappointments often arising from delayed yields resulting in the non-recovery of initial investments.

2.4

The processing methods in the tradition circles involve the boiling of the fruits after they have been chopped off the bunches and picked; these are then pounded in mortars, then squeezed out by hand and water displacement. The emulsion so formed containing the oil is gathered and boiled, and as the oil settles on top, it is collected. The oil so produced is generally used for house-hold purposes, such as cooking and crude soap production. Only 40 to 50% of the oil contained in the fruits can be said to be extracted by this process. It is obvious therefore that a great wastage results from this processing method.

It is estimated that about 90,000 tons of palm fruit bunches are treated in this way annually, but with a low rate of yield of about 8% producing about 7000 tons oil.

2.5

Another traditional form of palm oil production is the soup-making process. The fruits are first cooked, then pounded and washed. The kernels and fibres are all thoroughly removed, and the remaining stained water boiled for soup with a number of

ingredients added. Some oil settles on top of the soup; this is collected and later re-used for preparing stews. This is the method by which about 50% of the rural population in the wild-palm growing areas obtain their basic cooking oil. It is estimated that about 90,000 tons of palm fruits are consumed in this way annually. The oil by-product is about 1%.

## 2.6

Mechanical processing of palm fruits is a comparatively new industry. The largest unit is the State Farms plant in the Western Region of the country, now with a production capacity of 9 tons input per hour, but which can be increased to 18 tons as raw materials become available. This Mill is supported by a 14,000-acre planned plantation of which 12,000 acres have been planted with just over 7,000 acres yielding. The rate of yield is about 3.8 tons per acre. For the plant's production in 1971, it obtained 12,000 tons from its farms, and another 5,000 tons from private farms some of them as far away as 80 miles. The problem about supplies from the private farms is with transportation, as the Mill can only collect in own transport from farms within 20 miles radius. Fruits from farms more distant can be delayed for anything up to one week before delivery, resulting in deterioration of the fruits before processing.

## 2.7

The main technical problem for the mill is the supply of essential spare parts to enable quick repairs of break-downs, the most frequent of which occur with electric motors.

2.8

The same Organisation also operates another unit in the Eastern Region of the country using a hand-operated Hydraulic Press as the main equipment. The unit is supported by a 5000-acre plantation, nearly all of which is yielding. The press squeezes some amount of matter (oil, emulsion and little fragments of fibre) from the boiled fruit, leaving the fibres from which the kernel-nuts are picked for further processing. The emulsion is boiled for about 8 hours and left to stand over-night, after which the oil is skimmed from the surface and reboiled for about 5 hours to evaporate off the last traces of water. The oil so produced contains FFA of 6% - 23%.

On the average, the State Farms have achieved up to 19% oil yield, and with a total of 21,000 tons bunches treated in 1970, produced about 4,000 tons oil.

Tables 1 & 2 of the Appendices summarises the acreages of cultivations and production achievements for 1970.

## CHAPTER 3 - PALM KERNELS

The recovery of palm kernels from the palm fruit processing in an organized manner is only undertaken by the State Farms Mills which together in 1970 recovered 1,100 tons. But it is estimated that in total about 10,000 tons could be recovered from all types of fruit processing.

3.2 In 1969/70, the Vegetable Oil Mills(GIHOC) carried out a trial processing with 500 tons drawn from the State Farms, but this was later discontinued as it proved unprofitable. Another trial operation is currently under way and 800 tons will be treated. The existing equipment of the Mills would appear unsuitable for palm kernel processing.

3.3 The State Farms in 1969 exported 700 tons out of the year's yield and about the same quantity in 1970. The rest of the kernels, about 8,000 tons, are presumed to be processed by traditional methods in villages all over the oil-palm growing areas. With an extraction rate of about 25%, about 2,000 tons of oil are estimated to be produced annually in this manner.

3.4 The greatest problem in this area lies with the collection system. The kernels produced in small lots are so widely spread out that the collecting machinery required would be too expensive for the tonnages likely to be collected. For the purposes of industrial processing, it is not considered economical to depend on the rural sources of supply.

3.5 The State Farms Mills are currently installing machinery for processing palm kernels recovered by themselves, and it is possible that they will find it economical to supplement their own yield with collections from nearby centres.

## CHAPTER 4 - COCONUT

4.1

As already stated, coconuts are grown along the coastal areas, with patches existing from the east to the west where the most extensive plantations can be found. Though the plantations are on small-scales (5 to 10 acres) and individually owned, they extend continuously over a distance of about 80 miles. In all, it is estimated that there are about 100,000 acres of such plantations with about 6 million trees. The farms are being expanded, and it is estimated that by the end of the 1970's, yield of nuts would have trebled. In addition to these private farms, the State Farms Corporation now has under cultivation a total of 20,000 acres to be fully planted within the next ten years.

4.2

There are a number of uses made of coconuts in Ghana, quite apart from oil extraction.

4.3

First, a great deal of human consumption takes place when the fruit is in its juicy form unripened. There is quite a sizeable lucrative trade in this. Second - the nuts are allowed to mature and the hardened fruit taken out for human consumption raw or used as food condiments. Third - there is the processing for oil from the fresh hardened fruit by women all along the coast employing age-old traditional methods. This type of processing will be discussed later. Fourth - which is the most important - is the preparation of copra from the nuts for mechanical processing. Generally, the fruits are allowed to mature and drop by themselves when dried. They are collected together, cracked and the fruit scooped out and dried in the sun. It will be understood, therefore, that in Ghana, the production of Copra is a completely different exercise from the mere cultivation of coconut plantations.

4.4

Copra processing as an industry - or better as an extension of coconut plantation cultivation - does not appear to have made quick and satisfactory progress since the 1950's when it started. On the basis that there are about 6 million trees which can produce 360 million nuts a year, it should be possible to produce 60,000 tons copra if all the nuts were allowed to mature and picked up. But from all the records available and on the best estimates, not more than 8,000 tons of copra can be said to have been produced so far in any one year. This has been so because of:

- (a) Human consumption of fresh and matured fruits raw
- (b) The traditional processing for oil
- (c) The improper maintenance of plantations resulting in the non-collection of nuts from the thick undergrowth.
- (d) The unwillingness of plantation owners themselves to undertake copra preparation, in spite of various incentives offered by industrial users like the Vegetable Oil Mills.

Comparative producer-prices for coconut and copra prices are as follows:-

(i)	Coconuts (Fresh)	-	100 for US \$1.28
(ii)	Coconuts (Matured)	-	100 for US \$2.56
(iii)	Copra	-	1 Ton for US \$204.8

NOTE

- (a) 6,000 nuts produce 1 Ton Copra
- (b) It costs US \$15.36 to prepare 1 Ton Copra.

4.5

The traditional processing method is as follows: The matured fruit is milled raw; then soaked in cold water and allowed to stand in the water overnight. A sludge containing oil collects on the surface of the water, and this is gathered and boiled. The oil finally settles on the surface, and is then collected ready for human consumption. The yield of oil does not exceed 50%, and no cake is produced, as the residual cake substance is thrown away



as waste. So that by this method another 5% of oil is lost, and the 50% cake is also lost. It is clear that this method of processing is wasteful to the coconut industry and the country's economy.

4.6

Mechanical processing is undertaken by the Vegetable Oil Mills Division (VIMCO) in its biggest factory situated inside the coconut plantations of the Western Region. The factory is equipped to process copra for crude oil and later refine and also deodorise. The factory produces its own power from Generating Sets. The processing is undertaken by the use of 4 only Heaters and Presses of the D.P. type. There is also waiting to be rehabilitated an Expeller of the Ross Downe type which has a capacity of 3500 tons. The Refining Plant has a capacity of 5 tons per 8 hours, and the Deodorising Unit a capacity of 3.5 tons per 12 hours. But because these two units do not get supplied with adequate steam to allow simultaneous operations, only a maximum of 1500 tons can be refined, and 900 tons deodorised in a year.

4.7

Processing at the crude stage results in an average loss of 9.6% of copra input. An average loss of 6% on crude oil input occurs during the refining/deodorising stages.

4.8

The supply of raw materials (Copra) for processing has fallen far below requirements since the factory commenced operations in 1963. Following is a table of copra purchases and production inputs:-

YEAR	COPRA PURCHASES TONS	PRODUCTION TONS	CAPACITY UTILIZATION %
1963	3983	3376	35
1964	3570	4129	43
1965	2372	1901	20
1966	2900	2640	27.5
1967	2052	2749	28.6
1968	2702	1175	12.2
1969	3019	2265	23.6
1970	4000	3767	39
1971	5237	5106	53
1972 (Jan/May)	2112	2894	72

4.9

The main reason for this low rate of production would appear to be due to plant inefficiency, since raw materials purchases, except for 1964, have always exceeded production achieved. The plant inefficiency problem has been brought under control somewhat since 1969, and the emphasis has now shifted to the supply of raw materials. The problem of raw materials is being tackled in the following ways:-

- (a) The procurement systems have been improved with Collecting Centres now established in all the important villages, about 20 of them. In addition to receiving finished copra, the Centres are themselves purchasing nuts from the farms, and undertaking cracking and drying for copra.
- (b) It is proposed to offer further incentives to the farmers by increasing the producer price.
- (c) Consideration is being given to the establishment of an Agricultural Extension service which will advise farmers on initial cultivation and harvesting problems.

4.10

On the technical side the problem has been mainly one of inefficient maintenance service due to unavailability of spare parts at the right times, and also lack of suitable skilled personnel.

There has also been the problem of lack of suitable supervisory personnel for the actual production processes. The necessary training schemes are yet to be worked out and implemented; but hitherto, the operators have learnt by the trial<sup>and</sup>/error method almost without any skilled and experienced guidance.

4.11

In spite of these technical deficiencies, production by the factory have been of satisfactory yield and quality. Generally, the yield is about 60% for oil, and 30% for cakes. The quality specifications of oils and cakes produced are as follows:-

	<u>FFA %</u>	<u>Moisture %</u>	<u>Fat %</u>
Crude	3.011	0.26	-
Refined	0.028	0.09	-
Deodorised	0.028	0.01	-
Expeller Cake	-	4.73	6.77

## CHAPTER 5 - GROUNDNUT

5.1

Large-scale cultivation of groundnut as a cash crop takes place mainly in the Northern and Upper Regions of the country. The cultivation is in small farm holdings, with the groundnut generally planted as a second crop alongside millet and yam. The farm sizes are about one acre in the minimum and 5-acres maximum.

5.2

It is estimated that a total of 250,000 acres are cultivated by about 120,000 growers (15% of farming population) all over the country. Only about 45,000 acres are planted solely with groundnuts. The average yield is about 0.25 tons shelled nuts per acre. The success of the cultivation is very much subject to climatic conditions - planting in the Northern/Upper Regions, has got to be early in May, otherwise yield is reduced by one-half. Weeding of under-growths has got to be undertaken 4 times to attain the maximum yield; and finally, sufficient fertilizers require to be used, since the savanna soils are deficient in sulphur. No pesticides are currently in use by the growers to control diseases and pests - instead they employ means such as correct cultivation, adequate spacing and rotations to control these pests.

5.3

Estimates of production are not very reliable, but about 40,000 tons were expected to have been produced all over the country in 1970, with about 35,000 tons coming from the Northern/Upper Regions.

5.4

- The main purposes for which production is utilized are:
- (a) Seeds for next season's planting, about 12½% of yield, i.e. 5,000 tons.
  - (b) Home consumption - as dried nuts, meal, paste for soups and fried cake (after extraction of oil). This usage is very widespread throughout the country, and it is estimated that as much as 40% of yield, i.e. 16,000 tons are consumed in this way.

- 5.5 It is also claimed that some quantities of groundnuts are smuggled across the borders into neighbouring countries.
- 5.6 There is a great deal of traditional processing taking place in the growing areas, and one can estimate that up to 5,000 tons are utilized in the process.
- 5.7 After all these deductions, about 10,000 tons should be available for industrial processing. However, availability for this field has been as follows:
- |                |   |             |
|----------------|---|-------------|
| 1969/70 Season | - | 2550 Tons   |
| 1970/71 "      | - | 2000 Tons * |
| 1971/72 "      | - | 2000 Tons * |
- \* Poor harvests due to unfavourable climatic conditions.
- 5.8 The Mills pay US.\$287 per ton for groundnuts purchased through collecting agents, and one can reckon that the producer receives about 75% of this. The Mills are unable to buy from the producers direct due to the smallness of the farms and the manner in which they are scattered about. Overheads involved in a farm-to-farm collecting machinery will be too prohibitive.
- 5.9 Since groundnuts are harvested seasonally (September/March), it is necessary for the Mills to purchase nearly all annual requirements during the harvest, and stockpile for utilization. Involved in this are the problems of financing and storage.
- (a) The financing problem can be very acute and have contributed to the inability of the Mills to purchase more than they have obtained so far. Credits are not easily and readily available from financial and banking houses; where they are available, interest charges are high and add to the final raw material costs.
- (b) Storage is undertaken in sacks stacked in rows of 15 to 20 high. Frequent fumigation and rodent control has to be undertaken at some cost. The initial harvesting by the farmers involve immediate cracking

and sun-drying of the nuts, and this almost eliminates the incidence of mould attack, thus reducing the chances of aflatoxin development. Expeller cakes produced from our stored groundnuts have so far shown no traces of the toxin.

5.10

The traditional processing method is that the groundnuts are first roasted and milled; the paste is then mixed with water, and boiled; the oil collects on the surface and this is gathered. An estimated oil yield of 30% is achieved, against a possible 45%; the oil maintains the natural fried groundnut aroma, which the rural population very much like. Unlike the traditional copra oil processing operation, no wastage is allowed. The meal residue is re-fried into a sort of ring-cake for consumption.

5.11

On the mechanical side, the Vegetable Oil Mills have three factories in the Northern/Upper Regions each with an input capacity of 2,000 tons per annum. Only two of them have been operated during the last 3 years, and these at 60% capacity only, due to the inadequate supply of groundnuts.

The factories would appear to have been wrongly sited in that the immediate surroundings of each are unable to provide the required quantity groundnuts. To keep the two factories running, it has been necessary to transport the nuts over long distances thus increasing the costs. Preferably, all three factories could have been assembled on one site. Also the equipments have only operated at 75% efficiency. Spare-parts, as in the case of the Copra Mill, have been scarce. resulting in frequent production interruptions as break-downs cannot be put right on time. Production methods have not been altogether satisfactory due again to manpower deficiencies in quality. The yields for production have averaged 39% for oil and 50% for cake, and the quality specifications are generally as follows:-

	<u>FFA %</u>	<u>Moisture %</u>	<u>Fat %</u>
Crude Groundnut Oil	2.2	0.03	-
Refined " "	0.056	0.09	-
Deodorised " "	0.028	0.01	-
Cake	-	4.24	8.11

## CHAPTER 6 - SHEANUTS

- 6.1 Shea Tree grows wild only in the Northern/Upper Regions of Ghana as they are able to withstand the long droughts and the strong desiccating winds of the area. Its fruit is a kernel contained in a shell - the kernel is rich in oil which amounts to 45 - 55% by weight.
- 6.2 It is estimated that there are over 68 million trees grown in an area of 13,000 square miles. The estimated potential yield is 136,000 tons, but a substantial area of growth is not harvested.
- 6.3 These harvested nuts are currently utilized in two ways:
- (a) The extraction of butter by traditional methods for domestic uses such as cooking, fuel for lamps and anointing the body after bath.
  - (b) Exports - around 5,000 tons have been exported annually for 1967, 1968 and 1969.
- 6.4 The traditional extraction process involves the cracking of the nuts to remove the kernels already dried. These are crushed and roasted, then grinded into an oily chocolate coloured paste which is boiled over a period of time. The oil settles on top and is skimmed off. It is estimated that nearly 80,000 tons of kernels are treated annually, and at an extraction rate of 15% - 20%, produce nearly 16,000 tons of butter.
- 6.5 No mechanical processing takes place currently, but it is proposed to study the economic possibilities. Immediately, the export tonnage of 5,000 tons would be available for processing. With improved systems of collection and greater incentives to the collectors, this quantity can be readily increased to 10,000 tons.
- 6.6 The main problem with the development of this type of processing is that the local market only exists in the Northern/Upper Regions and is limited to the 1.5 million inhabitants who already can rely on their proven traditional processing methods. No export market for the butter has yet been found.

## CHAPTER 7 - COTTONSEED

7.1

Cultivation of cotton on large-scale commercial basis has been embarked upon, with an independent Cotton Development Board subsidized by Government spearheading this development. The objective is to supply as much raw material as possible for Ghana's growing cotton industries, which are expected to require nearly 20,000 tons raw cotton by 1980.

7.2

The forecast is that by 1973, about 5,600 tons of seed-cotton can be produced, which in turn will yield about 3500 tons of seeds.

7.3

The Vegetable Oil Mills Division of GINOC proposes to explore the possibilities of processing the seeds that will become available. The project will cover the extraction of oil and the production of lint.

## CHAPTER 8 - OIL CAKES

- 8.1 The traditional extraction processes for both Coconut Oil and Groundnut Oil do not produce any expeller cakes; the coconut meal is thrown away as waste, and that of groundnut is further processed for consumption.
- 8.2 The mechanical mills produce cakes - a total of 2,510 tons were produced by the Vegetable Oil Mills in 1970, and this increased to 3,000 tons in 1974. These tonnages are expected to increase with expansions in oil production.
- 8.3 All of the Groundnut Cakes were sold in Ghana, and nearly all of the Copra and Palm Kernel Cakes were exported, mainly to Western Germany. The Copra cake is said to have a comparatively low protein content, and the feedstuff manufacturers require to import high protein concentrates at extra cost to enhance the quality and suitability of the final product.
- 8.4 The forecast is that the market will expand for groundnut cake since they are suitable for poultry, the breeding of which holds very promising prospects. It is estimated the poultry population will reach 6 million by 1975/76 and about 5,000 tons of Cake will be needed at that time for processing.



## CHAPTER 2 - THE MARKET

- 9.1 Traditionally, the people of Ghana consume a great deal of edible oils as the main fats for cooking. With a population of 8.8 million in 1971, edible oil requirements for house-hold consumption were estimated at 37,000 tons excluding shea-butter, and were to grow at the rate of 2.7% per annum reaching 42,500 tons by 1974. Palm Oil is the most predominant, followed by Coconut Oil, then Groundnut Oil and lastly Palm Kernel Oil. Table 3 gives the products break-down.
- 9.2 The bulk of the oils for house-hold consumption is in crude form, mainly out of traditional processing. It is known, however, that there is a great preference for refined/deodorised oils, as the normal cooking pattern involves some form of archaic refining/deodorising. It was estimated that about 3,000 tons of refined high-grade quality oils were imported in 1969, and since the Vegetable Oil Mills commenced refining/deodorising production in 1970, the patronage has been remarkably satisfactory. The plant capacity of 1,500 tons is being increased to 4,000 tons to handle both coconut oil and groundnut simultaneously. This will ensure that the projected increases in demand are catered for.
- 9.3 Requirements for industrial purposes - manufacture of soap, margarine, ice-creams, etc - are now estimated at 26,000 tons, and will grow to 30,000 tons by 1974. Table 4 gives the products break-down, from which it will be noticed that the heaviest proportion is for Technical Crude Palm Oil, which is currently not being produced at all.
- 9.4 It has been felt that exportation of edible oils can be undertaken, but this expectation cannot materialise soon, due to the reasons that (a) Local demand will continue to rise steeply ahead of production (b) local processing costs will remain so high as to render the finished product-costs uncompetitive on the world market.
- However, if an export market can be found for shea butter, it is most likely to be the field in which substantial business can be undertaken.

## CONCLUSION

It is hoped that the principal features of the oil-seeds and vegetable oils processing industry have been sufficiently discussed to reveal the special problems involved.

In spite of the numerous problems existing, there is very great potential for the industry, in view of the great demand for oils internally and the prospects of export trade.

The problems can be overcome with a thorough re-appraisal followed by a proper re-organisation of production methods both in the agricultural and industrial sectors. In both sectors, substantial injection of funds and expertise will be required. The training of personnel and the improvement of administrative controls should be high on the development programme for the industrial sector. On the agricultural side, the supply of improved seedlings and fertilizers will be needed to achieve good yields. New methods of storage of the harvests and better organised marketing systems would have to be evolved in order to prevent the yields going to waste and also as a means of providing incentives to farmers.

Ultimately, success will depend on how much governmental support is obtained. For example, a current massive campaign spearheaded by the Government to revolutionise agriculture shows signs of increasing the groundnut and cotton-seeds harvests in the next few years, and thus make them adequately available for industrial processing.

TABLE 1

CULTIVATION & YIELD - PALM FRUIT

	Total Planted Acreage Acres	Yielding Acres	Rate of Yield Per Acre
STATE FARMS	20,000	15,000	2.8 tons approx.
OTHER PUBLIC PLANTATIONS	4,000	2,000	1.5 " "
FARMERS (IMPROVED VARIETIES)	3,000	5,000	1.5 " "
FARMERS (LOCAL UN-IMPROVED)	250,000	200,000	0.85 " "
	282,000	222,000	1.65 (Average)

T A B L E 2

PRODUCTION 1970 - PALM OIL

	Input (Tons)	Rate of Yield	Oil Produced (Tons)
STATE FARMS	20,000	19%	3,850
OTHER PUBLIC INSTITUTIONS	5,000	18%	900
IMPROVED TRADITIONAL METHODS	43,000	12%	5,800
RURAL TRADITIONAL METHODS	92,000	8%	7,400
	160,000		17,950

T A B L E 3

ESTIMATES OF HOUSE-HOLD CONSUMPTION MARKET FOR VEGETABLE OILS

YEAR	Number of House-hold Units		Total Demand Tons	ESTIMATED PRODUCTION			
	Urban	Rural		Palm Oil Tons	Groundnut Oil Tons	Cocunut Oil Tons	Palm Kernel Tons
1971	472,500	637,000	36,750	18,000	3,000	11,000	5,000
1972	485,000	654,000	38,600	18,000	3,000	12,000	5,000
1973	498,000	672,000	40,500	19,000	4,000	15,000	5,000
1974	512,000	690,000	42,500	19,000	4,000	16,000	5,000

TABLE 4

ESTIMATES OF INDUSTRIAL REQUIREMENTS  
FOR VEGETABLE OILS

(ALL FIGURES IN TONS)

YEAR	Total Demand	PRODUCTION BREAK-DOWN		
		edible Palm Oil	PPO/CNO	Technical Grades Palm Oil
1971	34,000	2,000	2,000	20,000*
1972	36,000	3,000	3,000	20,000*
1973	28,000	4,000	4,000	20,000*
1974	30,000	5,000	5,000	20,000*

\* Currently not in production. Satisfied by imports of Animal Tallow.

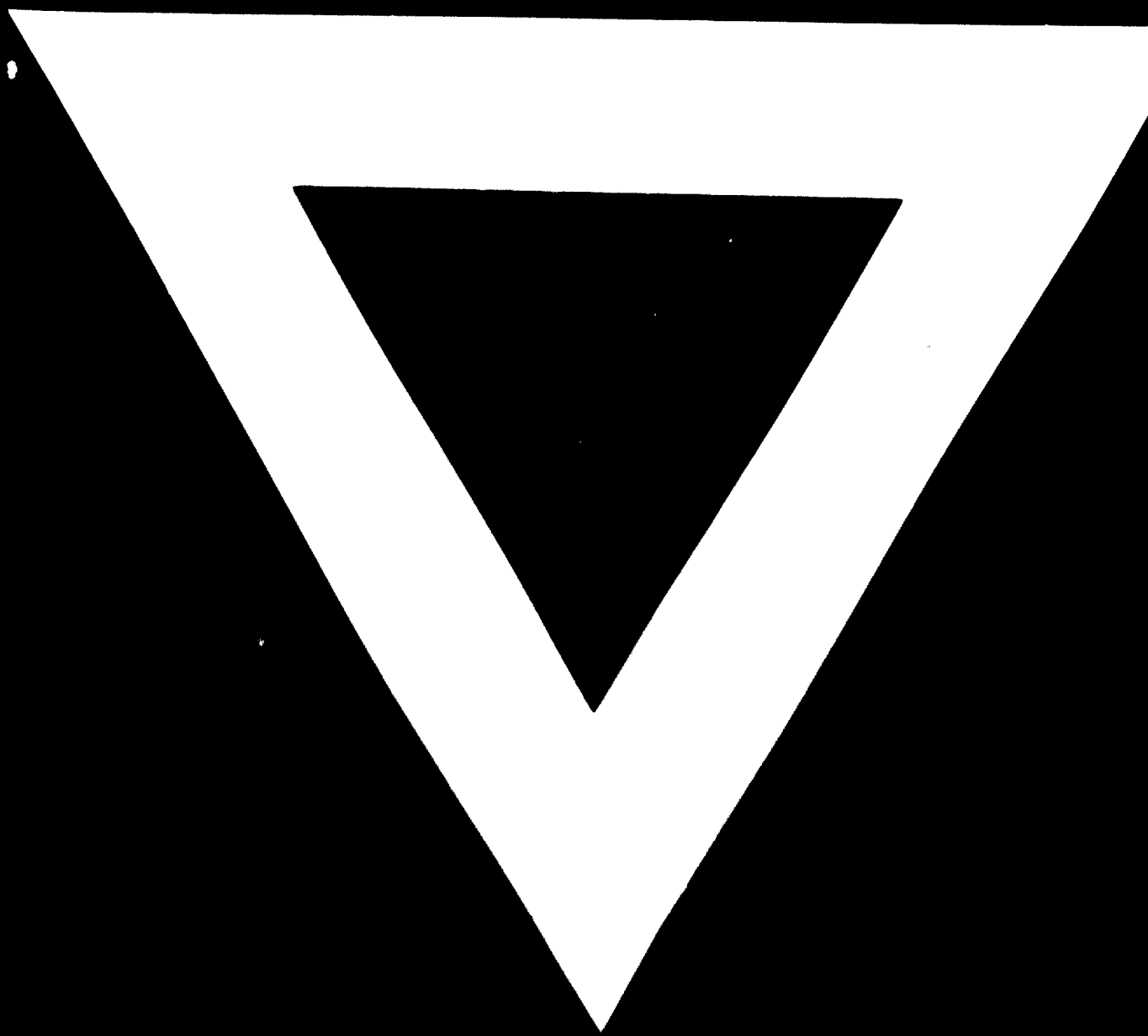
T A B L E 5

COMPARISON BETWEEN ESTIMATES OF  
PRODUCTION AND DEMAND

(ALL FIGURES IN TONS)

YEAR	Production	Total Demand	Excess Demand Over Production
1971	32,500	60,750	28,250
1972	34,000	64,600	30,600
1973	39,000	68,500	29,500
1974	40,000	72,500	32,500

The excesses, mainly represented by industrial demands, may be satisfied by imports of Animal Tallow and small quantities of Vegetable Oils.



**15. 7. 74**



