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SOME RESULTS OF A STUDY OF
THE VEGETABLE OIL CRUSHING INDUSTRY IN UGANDA.

Introduction

In this paper, I have attempted to outline the present situation in the oil crushing industry, giving first a brief description of the structure, followed by an analysis of the patterns of production, sales, and consumption of oils and fats. Lastly, I have considered the problem presented by the present location of the industry.

General Features of the Industry.

In 1965, there were 18 firms crushing oil seeds, of whom 6 had plant for producing double-refined oil, and 2 had plant for producing hydrogenated oils and fats. In addition to crushing oil seeds, the activities of grain milling, soap manufacture, and shelling groundnuts were common, and two of the largest firms were also producing tins for the oil and ghee.

All the firms crushed cotton seed, about half groundnuts, and a few crushed one or more of sesame seed, shea butter nuts, castor seed, and sunflower seed. On the whole the latter seeds are relatively unimportant accounting altogether for only a few hundred tons per year. Crushings of cotton seed are directly related to the size of the cotton crop, and vary between 100,000-130,000 tons 'AR' seed per year. (See Table 1 for sales of cotton seed by the Lint Marketing Board to the Ugandan millers.) Crushings of groundnuts seem to vary between 2,000 - 4,000 tons. (Estimates based on sales of groundnut cake recorded in the Kampala Produce Exchange, and on the East African Customs and Excise Annual Trade Reports for 1964 and 1965.)

The capacity of the firms operative in 1965 was 213,500 tons of seed double pressed per year. (The figure for 1960 was 197,500 tons.) In addition there was at least 30,000 tons of capacity still owned by firms inoperative in 1965.

Utilized capacity was around 66% of the total capacity of the 18 firms in 1965, and 61% of total capacity in 1960. For the four largest firms, though, i.e. those firms known as 'the big four', utilized capacity was 92% in 1965 and 82% in 1960. (It should be noted that 1965 was an exceptionally good year for cotton seed, and that the 1960 figure is more likely to represent the normal situation.) 'The big four' in fact dominate the industry, accounting for 50% of all capacity, and more than 70% of actual crushings of seed. The 'big four' are also responsible for the pricing policy of the industry.

The capacity of the industry for producing double-refined oil was around 15,000 tons of oil in 1965, and should be around 19,000 tons in 1966. In 1965 this plant was operating at 73% of capacity. The capacity of the industry for producing hydrogenated oils and fats was around 5,000 tons in 1965, operating at about 80% of capacity.

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cation

The total amount of labour employed in the industry in 1965 was around 1,400 permanent employees and 500 casual employees. Most of the employers were paying the minimum wage, with a bonus for seniority in a few cases. Seven of the eight largest firms with respect to capacity in 1965 employed only permanent labour, all the other firms employing predominantly casual labour.

The eight largest firms employing around 1,500 people, were generally operating on a three shift basis for 10, 11, or 12 months of the year, and had a throughput of 81 tons of seed per unit of labour employed in 1965. These firms accounted for 90% of the seed crushed in 1965. The remaining firms employed around 400 people, and operated on a one or two shift basis until the stock of seed was finished. Their throughput was less than 30 tons of seed per unit of labour employed. This difference is in part explained by the inability of the smaller firms to differentiate between labour employed in oil crushing and labour employed in the other activities of the firm.

With respect to machinery, 12 of the firms owned delinting equipment in 1965 but only 6 firms were actually delinting cotton seed. Delinters are expensive to run in terms of electricity, and in recent years the market for linters has been rather uncertain. Further, some firms had too little equipment to cope with the tonnage of seed which they habitually crush.

75% of the firms possessed decorticators for removing the outer shell from the seed, the remaining firms making use of grinding mills for this purpose. Most firms only owned one decorticator, although three of 'the big four' owned two or three decorticators. One of the firms was crushing whole seed rather than decorticated seed, but this could only be carried out on a small scale in Uganda, as the market for the type of cake produced by this method, i.e. 31% cake, is uncertain.

The 130 expellers owned by the firms were mainly of the old type, which leave around 6-7% of the oil in the cake. Numbers of expellers owned by individual firms varied from 2 to 25, giving crushing capacities ranging from 3,000 to 40,000 tons per year. (It is assumed that the average amount crushed per expeller per year was 1,630 tons.) 73% of the expellers were the Rose-Down model from the U.K., 10% were of Indian make, in many cases a copy of the Rose-Down model, 15% were German Krupp expellers, and the remaining 2% were from South Africa.

Refining plant was owned by six firms and is being installed by a seventh at Mbale. This plant is operated by 'the big four' at Jinja, and by two Kampala firms, who are using Italian plant. Hydrogenation plant was operated by two of 'the big four' at Jinja.

Production of oils and fats 1965.

The following estimates of production for 1965 are based on the evidence of millers, as taken in my census of millers in March 1966.

Production of semi-refined oil	=279,350 tins. (of 36 lbs. each)
Production of double-refined oil	=705,000 tins.
Production of vegetable ghee	=210,000 tins.
Production of solid fats	= 500 tons.

36,000 tins of the semi-refined oil were converted into double-refined oil.

This gives the production of liquid oils for final use as 948,350 tins, and the total production of all oils and fats as 1,189,461 tins of 36 lbs or 19,116 tons.

This production of 19,116 tons of oil and fats must have been produced from the 128,956 tons of 'AR' cotton seed sold to the millers by the Lint Marketing Board, an amount of around 11,000 tons of 'BR' cotton seed, and around 2,500 tons of groundnut and sesame seed. Using a 13% extraction rate for oil from 'AR' seed, 10% rate for oil from 'BR' seed, and 36% rate for oil from groundnuts and sesame seeds, an estimate of the amount of oil which should be obtained is 18,764 tons. The difference between this figure and that of 19,116 tons is easily accounted for by a 1% increase in extraction rate by the largest firm. Thus the figures given above seem to be reasonable in the light of the amount of seed crushed.

Production of oils and fats 1963.

These estimates are based on the information to be found in the 'Survey of Industrial Production 1963'¹, and other information concerning the amount of seed crushed in 1963.

If we assume that 98,289 tons of 'AR' cotton seed², 8,029 tons of 'BR' cotton seed², and 4,600 tons of groundnuts³ were crushed in 1963, this gives the total production of oils and fats, using the same extraction rates as above for oil from seed, as 15,236 tons or 948,047 tins of 36 lbs.

If we assume further that the production of the different types of oils was split in the same proportion as in 1965, this gives the production of oils and fats as follows:

Production of semi-refined oil	= 197,194 tins.
Production of double-refined oil	= 561,244 tins.
Production of ghee	= 170,648 tins.
Production of solid fats	= 305 tons.

If, though, the value of this production is calculated at 1965 prices, given as 48/- per tin for double-refined oil, 38/- per tin for semi-refined oil, 55/- per tin for ghee, and ls. 20 cts. per lb. for solid fats, it is found that sales of ghee and solid fats have been grossly over-valued and those of liquid oils undervalued when compared with the figures for sales given in the survey results.

If, though, the amount of ghee and solid fats produced as above is halved, and the difference added on to liquid oils, this gives sales figures for both liquid oils and ghee and solid fats in line with those given in the survey results. The production figures⁴ are as follows:

Production of semi-refined oils, (excluding sales to refineries)	= 244,030 tins.
Production of double-refined oil	= 694,545 tins.
Production of ghee	= 85,324 tins.
Productions of solid fats	= 152.5 tons.

1. Statistics Division, Ministry of Planning and Community Development.
2. Figures for cotton seed were derived from the consumption figure given in the survey for cotton seed.
3. Figure for groundnuts derived from the amount of groundnut cake sold through the Kampala Produce Exchange, and information on cake production from the survey results.
4. These figures may be under-estimated due to the exclusion in the survey of a number of very small firms.

Prices of oils and fats.

For 1965.

These figures are based on the evidence of the millers with adjustments so that they conform with figures given in the East African Customs and Excise Annual Trade Report for 1965.

Semi-refined oil.

	Amount.	% of total production.	approx. value ¹ (in Shs.)
Production (excl. sales to refineries.)	243,350 tins		9,247,000
Sales to Kenya	187,159 tins	77%	7,112,042
Home consumed	56,191 tins	23%	2,135,258

Double-refined oil.

Production	705,000 tins		33,840,000
Exports outside E.Africa	54,189 tins	8%	2,601,072
Sales to Kenya	267,394 tins	38%	12,834,912
Sales to Tanzania	28,706 tins	4%	1,377,888
Home consumed	354,711 tins	50%	17,026,128

Ghee

Production	210,000 tins		11,550,000
Exports outside E.Africa	683 tins	0.3%	37,565
Sales to Kenya	138,811 tins	66%	7,634,605
Sales to Tanzania	5,100 tins	2%	280,500
Home consumed	65,406 tins	31%	3,597,330

Solid fats.

Production	500 tons		1,344,000
Sales to Kenya	350 tons	70%	940,800
Sales to Tanzania	50 tons	10%	134,400
Home consumed	100 tons	20%	268,800

1963. Based on data from the East African Customs and Excise Annual Trade 1963.

Semi-refined oil

	Amount	% of total production	approx. value ² (in Shs)
Production (excl. sales to refineries)	244,030 tins		9,273,140
Sales to Kenya (Total sales to Kenya split as between semi- and double-refined oil as in 1965.)	160,522 tins	66%	6,099,836

1. Prices were taken as 38/- per tin for semi-refined oil, 48/- per lb. for solid fats. Liquid oil prices were based on the results of an enquiry into the prices of edible oils under-taken by the Ministry of Commerce and Industry in June 1965.

2. Same prices used as in 1965.

Sales to Tanzania and for export assumed nil as in 1965.

Home consumed	83,508 tins	34%	3,173,304
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Double-refined oil.

Production	694,545 tins		33,338,160
Exports outside E.Africa	53,750 tins	8%	2,580,000
Sales to Kenya	230,995 tins	33%	11,087,760
Sales to Tanzania	57,414 tins	8%	2,755,872
Home consumed	352,386 tins	51%	16,914,528

Ghee¹

Production	85,324 tins		4,692,820
Sales to Kenya	49,395 tins	58%	2,716,725
Sales to Tanzania	3,922 tins	5%	215,710
Home consumed	32,007 tins	38%	1,760,385

Solid fats¹

Production	152.5 tons		409,920
Sales to Kenya	129 tons	85%	346,752
Sales to Tanzania	4 tons	3%	10,752
Home consumed	19.5 tons	13%	52,416

Production and Sales of cake.

1965.

The millers gave evidence to the effect that almost all the cake produced in Uganda was either exported outside East Africa or sold to Kenya. On this basis, therefore, we would expect that the figures of sales of cake given in the East African Customs and Excise Annual Trade Report should give a reliable picture of production of cake in 1965. In fact, other estimates of cotton seed cake production based on the amount of seed thought to have been crushed, yield figures for cake about 2,000 tons below that given in the Trade report. This may be due to under estimates of the amount of seed available for crushing.

The figures from the Trade Report for cotton seed cake are as follows:

	Amount	% of total production	Value ² in Shs.
Exports	68,025 tons	99%	34,012,500
Sales to Kenya	699 tons	1%	349,500
Total	68,725 tons		34,362,500

1. It is difficult to separate sales of ghee and solid fats to Kenya and Tanzania with the data available. The figures given are only rough estimates.
2. Price received by the millers for cotton seed cake was around 500 shs. per ton in 1965.

The figures from the Trade Report for groundnut cake are as follows:

	Amount	% of total production	Value ¹
Exports	700 tons	87%	420,000
Sales to Kenya	101 tons	13%	60,600
Total	801 tons		480,600

The figures given for groundnut cake in the Trade Report are definitely under-estimated, for in 1965 the Kampala Produce Exchange recorded 1,050 tons of groundnut cake sold. (The approximate value of this would be 630,000 Shs.)

1963.

Estimates of cake production for 1963 based on the amount of seed crushed, yield a figure of 54,253 tons of cake produced, which figure is in line with the figure given in the survey results. As in 1965, though, this figure is below that given in the Trade Report figures.

The figures from the 1963 Trade Report are as follows:
For cotton seed cake.

	Amount	% of total production	Value ² in Shs.
Exports	58,412 tons	98%	29,206,000
Sales to Kenya	1,379 tons	2%	689,500
Total	59,791 tons		29,895,500

Sales of groundnut cake are not separately classified in the Trade Report for 1963, and from the figure given for other cake in the Report it is not possible to distinguish groundnut cake from castor seed cake, coconut cake etc.

Sales of groundnut cake through the Produce Exchange amounted to around 1,500 tons, which at a price of 560 shs. per ton, gives the value of groundnut cake production in 1963 as 740,000 shs.

Three other products also result from oil crushing. These are linters, husk, and soap-stock, which account for 5%, 40%, and 1% respectively by weight of the original cotton seed.

Approximately 1,400,000 lbs. of linters were produced in 1965 and sold at around 50 cts. per lb. of this total, 21,600 lbs. were sold to Kenya. The total value of the linters to the industry in 1965 was 700,000 shs. I have no figures for output in 1963.

Nearly all the husk produced is burnt in the boilers at the oil mills. Its value is difficult to assess, but is related to the cost of operating the boilers with other types of fuels, and the price which could be obtained for the husk if it were sold as a fertilizer, cattle-feed, or packing material.

Again the value of soap-stock is difficult to calculate. Firms making use of such stock usually supplement it with supplies of other oils, in order to produce bars of soap.

1. Price received by the millers for groundnut cake was around 600 shs. per ton in 1965.
2. Price received by millers for cotton seed cake 500 shs. per ton in 1963.

The value of Uganda's sales of oils and cake is considerable. The following figures give the value of sales outside Uganda for the years 1963 and 1965. The figures are taken from the East African Customs and Excise Annual Trade Reports for 1963 and 1965. In the case of 1963 the value of sales of liquid oils, hydrogenated oils and fats, and cake are given, while for 1965, the value of sales of liquid oils, ghee, and cake are given.

1963.

1. to Kenya	£ 832,166
2. to Tanzania	£ 105,373
3. exports	£1,653,622
4. exports less cost of transport to the coast ¹	£1,408,637
5. total	£2,346,176

1965.

1. to Kenya	£1,429,554
2. to Tanzania	£ 89,001
3. exports	£1,938,969
4. exports less cost of transport to the coast ¹	£1,660,253
5. total	£3,178,808

These figures enable us to make some statements about the pattern of production in the industry, and to consider the future potential of the industry.

Between 1963-1965 there was a 28% increase in the amount of seed crushed, which led to a 5% increase in the output of liquid oils, and a 154% increase in the output of hydrogenated oils and fats.

For liquid oils, 42% in 1963 and 48% in 1965 was sold to Kenya, 6% in 1963 and 3% in 1965 was sold to Tanzania, 6% in both 1963 and 1965 was sold to countries outside East Africa, and the residual 46% in 1963 and 43% in 1965 was sold within Uganda. These figures show that there has been little change in the production of liquid oils and their markets between 1963 and 1965.

For ghee and solid fats, though, there was a large increase in production between 1963 and 1965, which has led to large increases in sales to Kenya and Tanzania, and a more than doubled home consumption of ghee and solid fats.

Much the most important market for liquid oils besides Uganda is that of Kenya, as it is also for ghee and solid fats. Thus the ability of the industry to maintain its present output and to expand will depend not only on the home market for oils and fats, but also on the demand for Ugandan produced oils and fats in Kenya. Production of oil within Kenya itself is unlikely to grow, but the expansion of the oil crushing industry in Mwanza, associated with the increase in the Tanzanian cotton crop, must present a serious threat to the Uganda industry. Further, not only may the Mwanzan industry

1. Cost of transport to the coast taken as 5/60 per cental for oil and ghee, and 3/55 per cental for cake. These prices are taken from the East African Railways and Harbours Tarrif Book.

take a greater share of the Kenya market, but it may also take a share of the Ugandan market, if the prices charged are competitive with those of Uganda millers.

The production of cake according to the Trade figures increased by 15% between 1963 and 1965. At present 98% of the cake is exported to Europe as a cattle feed, but with the introduction of exotic cattle in Uganda we may expect that home consumption of cake will gradually increase. Certainly the market for cake seems to be assured in the foreseeable future.

The future potential of the industry with respect to quantity of output, is completely dependent on the supplies of seed available for crushing. The present crushing capacity of the industry is more than 200,000 tons per year, and on the evidence of millers would be readily expanded if the cotton crop were to increase significantly. Hydrogenation plant and double-refining plant is also in excess capacity at the present time (1966). Thus we do not expect crushing capacity to be a limiting factor in the expansion of the industry.

Since 1954, the amount of seed available for crushing has risen from around 100,000 tons to 150,000 tons per year. The Uganda Second Five-Year Plan¹ suggests that "a great deal of effort will be put into expanding cotton production by over one-third during the plan to 575,000 bales by 1970/71."

If this target were achieved, the amount of seed available to millers would rise to about 170,000 tons per year. The consequent increase in output over the 1965 level of oils and fats would be around 240,000 tins of 36 lbs., and the increase in the output of cake around 14,000 tons. Valuing the oils at 50/- per tin, and the cake at 500/- per ton, this gives the increase in value of output over 1965 as £950,000.

The total value of output for oils, fats, and cake for 1963 was £3.9 m. for 1965 £4.9 m., and for 1971 if the output of cotton seed is achieved, would be £5.5 m.

In 1963, around £2.3 m. was earned from sales of oil products outside Uganda, and in 1965 this total reached around £3.2 m. Thus the value to the country of the industry in terms of foreign earnings is considerable.

Consumption of oils and fats in Uganda.

1965.

A combination of figures from the East African Customs and Excise Annual Trade Report 1965, and the calculations for production of oils and fats above, enables us to estimate the consumption of oils and fats in Uganda.

Liquid oils.

	Amount	% of total production
Produced in Uganda	410,902 tins	95%
Bought from Kenya (excl. oil sold to refineries.)	19,458 tins	5%
Total	430,360 tins	

1. "Work for Progress" Uganda's Second Five-Year Plan.
1966-1971.

<u>Ghee.</u>	Amount	% of total production
Produced in Uganda	65,406 tins	64%
Bought from Kenya	10,281 tins	10%
Bought from Tanzania	400 tins	-
Imports from outside E. Africa	26,317 tins	26%
Total	102,404 tins	

No figure can be given for solid fats, because they are not separately classified in the Trade Report for 1965. Consumption of home produced solid fats was calculated earlier as 100 tons.

1963.

<u>Liquid oils.</u>	Amount	% of total production
Produced in Uganda	435,894 tins	92%
Bought from Kenya	2,017 tins	1%
Bought from Tanzania	34,681 tins	7%
Total	472,592 tins	

Hydrogenated oils and fats.

Produced in Uganda	33,220 tins	55%
Bought from Kenya	6,028 tins	9%
Bought from Tanzania	21,628 tins	36%
Total	60,876 tins	

Due to a different classification for oils and fats in the Trade Reports for 1963 and 1965, it has not been possible to give the same break-down for consumption for the two years.

From the figures it looks as though consumption of liquid oils fell between 1963 and 1965, while that of hydrogenated oils and fats doubled. There is definitely some downward bias though in the 1963 hydrogenated oils and fats total, arising from an upward bias in the total of liquid oils for that year. It is not possible from the Trade Report figures to differentiate between semi- and double-refined oils bought from Kenya and Tanzania. Much of the semi-refined oil bought from these two countries was probably sold to Ugandan millers with refining and hydrogenation equipment, and sold finally as ghee, solid fats or double-refined oil. The error in the figures is likely to be of up to 30,000 tins.

The figures show that the consumption of liquid oils between 1963 and 1965 probably remained fairly static, while that of ghee and solid fats increased by 28%

For liquid oils, demand is almost entirely met from home produced oils, but in the case of ghee and fats only around 60% is satisfied from home production, the remainder being imported from outside East Africa or bought from Kenya. Sales of ghee to Kenya, though, appear to be far in excess of purchases from Kenya, and production of ghee and solid fats was in 1963 and 1965 in excess of total consumption in Uganda. Thus at present Uganda could be completely self-sufficient in oils and fats should this be necessary.

With only data for two years available, it has not been possible to construct any model showing the pattern of demand in the country for oils and fats. The figures suggest that liquid oils consumption has remained static over the past three years at around 400,000-450,000 tons of 36 lbs. per year, while consumption of ghee and solid fats has risen. With increasing gross disposable income per person in the country as the economy grows, we may expect the consumption of both liquid oils and ghee to increase, as these two products are not completely substitutable. We would also expect there to be a substitution of double-refined oil in place of semi-refined. Unfortunately I cannot show changes in consumption as between the two liquid oils with the data available to me.

If the country is to remain potentially self-sufficient in oils and fats, expansion of double-refining and hydrogenation capacity must be more than in proportion to the expansion of utilized crushing capacity. The present (1966) double-refining capacity is of 18,000-19,000 tons of oil per year, and that of hydrogenation plant around 5,000 tons of ghee and solid fats per year.

If the cotton seed crop increases to 170,000 tons by 1971, the amount of double-refining capacity needed to refine all the oil produced would be around 22,000 tons. This indicates the need for a small expansion in double-refining plant in the next five years. Such an expansion could be achieved by the setting up of one new double-refining unit in the country. The position concerning hydrogenation plant is more difficult to judge. In 1965, about 20% of the consumption of all oils and fats was in the form of hydrogenated oils and fats. On this basis, assuming that as gross disposable income rises the consumption of all oils and fats rises in the same proportion, the present capacity would seem to be sufficient to supply the home market. In terms of total production of all oils and fats, though, hydrogenated oils and fats accounted for 25% of total production in 1965. This would indicate therefore, that if Uganda is to continue to sell the same proportion of oils and fats to Kenya, one extra unit of hydrogenation equipment is needed in the industry in the next five years.

The problem of location

The situation in 1965 in the industry is that a total of eighteen firms were operative. The firms were located as follows:

Place	Number of mills.
Jinja	8
Tororo	1
Mbale	3
Soroti	1
Kampala	5

This shows us that the industry is completely concentrated in the Eastern region and Buganda.

Table 2. shows the figures for the proportion of seed produced according to region. Figures grouped under A. and B. derived from the Department of Agriculture Annual Reports, show the % of seed cotton and hence also cotton seed produced in each area for the year 1962/3, and as a mean for the period 1957/8-1961/2.

The third set of figures C., gives directly the production of cotton seed and the amount set aside for planting for the year 1963/4. This enables the % to be calculated for the amount produced by region, and the amount available for allocation to millers by region.

If we consider the percentages produced by region for A., B. and C., the closeness between A. and C. is quickly apparent. What seems to have been happening over the period 1957/8-1961/2, is that production in Buganda has been steadily falling, while that in the Northern and Eastern regions has been rising. This explains the different percentages in B.

In order to find figures which may be related to the present location position in the industry, I plan to use the figures C. These have the additional advantage of yielding a percentage for available cotton seed by region, which data is not available for other years.

From comparison with A. and B., I do not believe the production figures given in C. to be abnormal. What is more difficult to ascertain, is whether the planting requirements were normal in 1963/4, and that their distribution between regions followed a normal pattern. I must assume that planting requirements were normal in the absence of any other information.

Figures C. indicate that 8.1% of the seed is available in Buganda, 4.4% in the Western region, 53.8% in the Eastern region, and 33.7% in the Northern region.

If we accept the normal figure for the amount of seed available as 100,000 tons per year, this gives the available amounts of seed by region as:

Buganda	around	8,000 tons
Western		4,000 tons
Eastern		54,000 tons
Northern		34,000 tons

The percentage of mills operative in each region, and the percentage of total capacity within each region was as follows:

Region	No. of mills 1965	% of all mills	Capacity 1965	% of total capacity
Buganda	5	27.8	30,500 tons	14.6
Western	-	-	-	-
Eastern	13	72.2	179,000 tons	85.4
Northern	-	-	-	-
Total	18		209,500 tons	

Obviously any discussion on the problem of location must be centred on the relative costs of production in the different locations. In the case of oil crushing, the cost difference between a source orientated industry and a market orientated industry will be considered. In what follows, my argument centres mainly on the cost of transport involved for the different locations of the industry. I have made no allowance for the possible economies from operation in Jinja or Kampala say, rather than in Lira or Gulu, except of course those arising from the movements of seed and their products. With respect to oil crushing I do not think these other economies are important. What may be more relevant, is that nearly all oil milling firms are engaged in joint enterprise, producing soap, maize flour, shelled groundnuts, etc. in addition to oil and cake. These other activities may considerably affect the optimum location of the firms in the industry, and in part

explain the present concentration of the industry in the Eastern region.

The consideration of relative costs below, is based on the railway tariffs for seed and seed products, obtained from the East African Railways and Harbours Tariff Book.

For the Northern region, where at present there is no crushing capacity, let us consider Gulu as a central point on which to base our calculations.

The costs of transport from Gulu of seed are as follows:

to Soroti	1/30 per cental
to Mbale	2/05 per cental
to Jinja	2/50 per cental

With only one mill in Soroti operating on a very small scale, nearly all the seed from the North must be transported at a cost of more than two shillings per cental, or 44/80 per ton, to other parts of Uganda for crushing.

Now if we take a 13% extraction rate for oil from seed, and a 46% rate for cake, this gives from one ton of seed, a total of:

291.2 lbs. of oil
1,030.4 lbs. of cake

If we consider the case of all oil and cake being exported. If the seed is crushed in Gulu as opposed to Jinja say, a reasonable case to consider as most of the Northern crop is crushed in Jinja, the extra cost of railage of the final products to the coast is as follows:

75 cts. per cental of oil
50 cts. per cental of cake.

These figures imply an extra cost of 7/35 per ton crushed for the Gulu miller as opposed to the Jinja miller.

On the other hand, the cost of transporting the seed to Jinja from Gulu to crush, is 56 shillings per ton, thus yielding a cost advantage to the Gulu miller of 48/65 per ton of seed crushed, if the seed were produced in the Northern region.

Even if the oil is sold within Uganda, the advantage is still considerable, the more especially so as a Northern based mill would serve a local market in the Northern region more efficiently than a Kampala or Jinja based mill, and may also serve the Western part of Uganda more efficiently.

My conclusion from this evidence, is that there would be a considerable saving in the costs of production to the industry if the seed were to be crushed near to source. This is not an altogether surprising conclusion when it is remembered that only 13% of the original seed by weight forms oil, and 46% cake, thus showing that around 40% of the original seed by weight forms waste most of which is burnt in the boilers of the mill.

One of the factors leading to the uneconomic location of the industry, has been the allocation of seed system employed by the Lint Marketing Board since 1954. Auctions are held in Kampala or Jinja by the Lint Marketing Board at which the millers bid for their seed. The L.M.B. then arranges to pay for the transport of the seed from the gineries to the oil mills

or to the nearest mill station. The cost of this transport is not paid by the miller, but comes from the L.M.B. funds collected from the sales of cotton seed. By so doing the L.M.B. claim to be able to distribute the seed from the ginneries to the millers in the most efficient manner. Given the present location of the mills and ginneries, the system employed by the L.M.B. does seem to have led to efficient distribution (I was given data for 1963/4 and was able to check this fact), but such a system does not encourage an optimum, location of the industry, which as we have shown above, we would expect to be source and not market orientated.

Two further factors should be noted. Joint production, an important feature of the industry, will undoubtedly affect location. Secondly, the supply of seed in any one area may be insufficient to support an oil crushing plant, although this is only likely to apply in Uganda to the Western region.

All other factors being equal, what pattern of location on the grounds of cost advantage would be expected to emerge in Uganda?

With the costs of railage from Jinja and Kampala being identical, we should expect all Buganda seed to be crushed within Buganda. Thus we would expect, assuming a normal amount of 100,000 tons of cotton seed made available to the millers, that a total of at least 8,000 tons of seed should be crushed in Kampala.

As mentioned before, the economics of milling in the Western region are doubtful due to the small amount of seed there, and on these grounds, we would expect the Western region crop also to be crushed in the Kampala mills. This indicates that Kampala mills should be crushing around 12,000 tons of seed per year.

Eastern region millers should be crushing seed available in that region totalling 54,000 tons per year, and Northern region millers 34,000 tons.

In 1963/4, only 8,560 tons of seed were crushed by Kampala millers, giving an amount of around 3,500 tons transported to Jinja at a cost of 50 cts. per cental. Further, in 1965, approximately 34,000 tons from the North were transported to the East for crushing, at a cost of more than two shillings per cental. These movements cost the industry 1,562,400 shs., which sum was paid for by the L.M.B. Thus the present location pattern of the industry is creating a loss to the country of over £70,000 per year.

In making any suggestions as to the future location of the industry, it is obviously important to know not only the likely amount of seed to be produced five years hence, say, but also the source from which this seed will be available.

The intended expansion of the cotton crop to 575,000 bales by 1970/71¹ is to be achieved by:

- "(a) the control of pests
- (b) the use of fertilizers
- (c) the introduction of higher yielding varieties
- (d) the adoption of more modern cultivation techniques."

The plan does not envisage increases in acreage of cotton to give the expansion in bales projected, but rather more intensive cultivation of the existing acreage. As there is no reason to expect a continuing switch within Buganda from cotton

1. Uganda Second Five Year Plan 1966-1971.

to coffee - prices received for Robusta coffee are now falling - it would seem reasonable to expect the increases in output to be spread over the regions in the same proportions as output was spread between the regions in the past.

Thus, assuming that the seed output will be distributed amongst the regions in the same proportion as in 1963/4, and assuming that the percentage of seed allocated for planting requirements in the different regions remains unchanged, we can make the following estimates for production of seed by region in 1970/71:

Region	Amount of cotton seed available in tons	% by region
Buganda	13,770	8.1
Western	7,480	4.4
Eastern	91,460	53.8
Northern	57,290	33.7
Total	170,000	

These figures indicate the following crushing capacities will be required in each region in 1970/71:

Buganda	around 25,000 tons
Western	nil
Eastern	95,000 tons
Northern	60,000 tons.

This again assumes that the amount of seed produced in the West is insufficient to operate an economic mill. The figures make allowance for the production of around 10,000 tons of seed other than cotton seed.

If the projected cotton crop should be achieved, with the existing location of the industry, the loss to the country by 1970/71 resulting from the transfer of seed from the North to the East will amount to more than £130,000 per year. Surely, such a loss to the industry cannot continue to be tolerated.

If the Lint Marketing Board were to stop the present system of paying for the cost of transport from the ginneries to the oil mills, within a comparatively short time there will be a response from the millers. What is uncertain, is the form that this response would take.

The millers may relocate their mills so as to avoid the higher transport costs in particular for seed from the North. What is far more likely, though, is that the millers will in their capacity as monopsonist buyers of seed, force the price of seed down to the point at which they can cover the costs of transport of their seed without hardship. The present prices for Uganda cotton seed are around 500 shillings per ton, as compared with export prices for cotton seed of only 300 shs. per ton f.o.r. Uganda, so there is still considerable room for the millers to force prices down. Differential prices are also likely to develop for seed from the different regions of Uganda, according to the distance of the source of seed from the miller. This will make the system of auctioning and allocation of seed very complicated.

Presumably, as the Lint Marketing Board would still receive the proceeds of the sales of seed, and not the ginneries, there is no problem so far as the ginneries are concerned with these

differential prices. On the other hand, this system would be no better than the old system, with a loss of potential revenue from the seed still taking place.

The position today is even more serious with regard to this loss in revenue to the country than it was in former years. The Lint Marketing Board have been using the revenue from cotton seed to offset the losses made on sales of cotton lint. Now that the Price Assistance Fund has been exhausted, the problem of making the largest possible revenue from cotton seed has become the more critical, so that the price paid to the grower for his raw cotton can be maintained.

The alternative open to the Government, rather than making the millers pay the cost of transport for the seed, is to provide legislation to the effect that seed produced in the Northern region should be crushed within that region. This legislation could either be followed up by the Government itself setting up a mill in the North, or such development could be left to private enterprise.

The cost of building one mill in the North sufficient to crush the present Northern seed crop, would be less than £500,000 an outlay which seems comparatively small beside the gains to the country from this relocation.

Table 1.

Sales of 'AR' seed by the Lint Marketing Board to Ugandan millers, given in tons.

	All millers	'The big four'.
1957/58	72,590	66,574
1958/59	88,800	77,378
1959/60	107,000	75,940
1960/61	108,500	80,737
1961/62	28,800*	19,026
1962/63	99,581	74,490
1963/64	106,259	86,020
1964/65	128,956	91,315
1965/66	98,050	77,795

Source: Correspondence with the Lint Marketing Board.

*1961/62 was the year in which flooding ruined the cotton crop.

N.B. In addition to these purchases by millers, the Lint Marketing sold around 11,000 tons of 'BR' seed per year to the millers.

Table 2.

A.			
Region	Sales in tons of seed cotton 1962/3	Amount of cotton seed (65% extraction)	% of seed by area.
Buganda	38,851	25,253 tons	18.8
Western	10,275	6,679 tons	5.0
Eastern	104,297	67,793 tons	50.4
Northern	53,580	34,827 tons	25.9
Total	207,003	134,552 tons	

B.			
Region	Sales in tons of seed cotton 1957/8-1961/2	Mean amount of cotton seed 1957/8-1961/2	% of seed by area.
Buganda	48,884	31,774 tons	25.1
Western	9,547	6,206 tons	4.9
Eastern	93,793	60,966 tons	48.1
Northern	42,606	27,693 tons	21.9
Total	194,829	126,639 tons	

C.					
Region	¹ Production of cotton seed.	² Planting requirements.	³ Seed available for allocation	%(1)	%(3)
Buganda	20,098 tons	10,578 tons	9,520 tons	13.8	8.1
Western	6,765 tons	1,601 tons	5,164 tons	4.7	4.4
Eastern	76,477 tons	13,209 tons	63,268 tons	52.7	53.8
Northern	41,939 tons	2,303 tons	39,636 tons	28.9	33.7
Total	145,279 tons	27,691 tons	117,588 tons		

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