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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

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VEGETABLE OILS AND FATS COUNTRY

EVALUATION SURVEYS IN SELECTED

DEVELOPING COUNTRIES

UF/INT/78/052

(R)

Technical report: Survey of the oils and fats industry in Somalia

Prepared for the Government of Somalia by

the United Nations Industrial Development Organization

Based on the work of Ben Braae, expert in the production of vegetable oils and fats

id. 79-1022

Explanatory notes

The monetary unit in Somali is the Somali shilling (SoSh). During the period covered by the report the value of the Somali shilling in relation to the United States dollar was $US 1 = SoSh 6.23.

The following abbreviations have been used in this report:

ADC	Agricultural Development Corporation
EEC	European Economic Community
ENC	Ente Nazionale di Commercio (National Trade Agency)
FAO	Food and Agriculture Organization of the United Nations
FFA	Free fatty acid

Mention of firm names and commercial products does not imply the endorsement of the United Nations Industrial Development Organization (UNIDO).

ABSTRACT

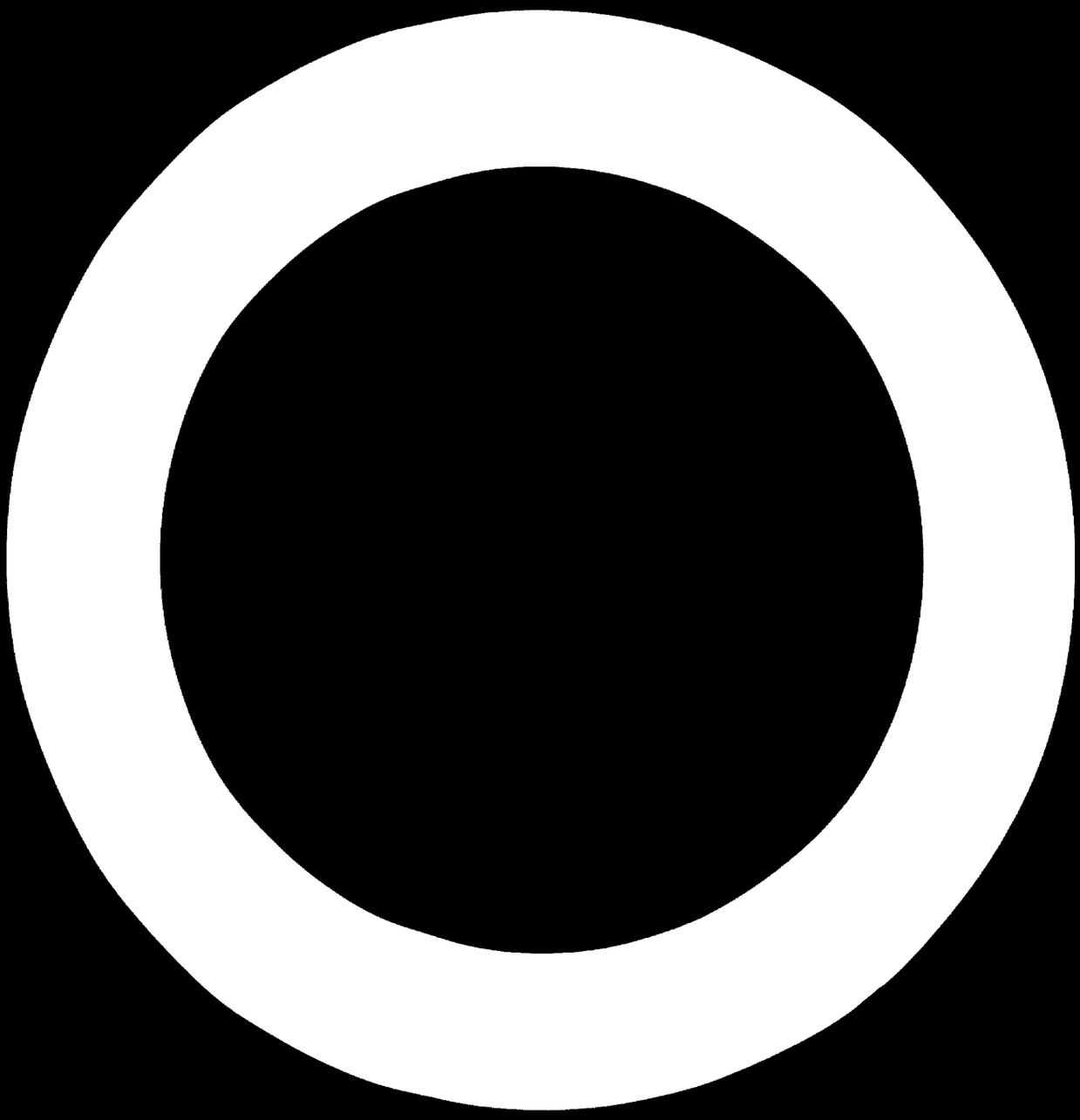
As a follow up of the First Consultation Meeting on the Vegetable Oils and Fats Industry, convened by the United Nations Industrial Development Organization (UNIDO) in December 1977 at Madrid, UNIDO decided to carry out evaluation studies of the vegetable oil industries sector in selected developing countries.

The objective of the project entitled "Vegetable oils and fats country evaluation surveys in selected developing countries" (UF/INT/78/052), which was approved on 20 March 1978, is to assess and evaluate the present situation in these countries with regard to the cultivation and utilization of oil-bearing raw materials; the number, the type, the capacity and the technology applied, of oil processing plants in operation; the demand on the domestic market; and the export potential.

As part of the project an expert in the production of vegetable oils and fats was sent to Somalia. He took up his assignment of one month on 6 November 1978.

His recommendations can be summarized as follows:

In order to overcome the insufficient supply of local oil seeds the area under cultivation should be increased and, especially, the yield per hectare considerably increased by applying different sowing and harvesting methods, weed control etc.; the oil yield per ton of seeds should be augmented by installing suitable pre-treating equipment and by better maintenance of the mills; to use the full capacity of the State oil mill, copra, coconut oil or palm oil should be imported for the time being, and suitable storage facilities for these raw materials installed; animal fat and the oil contained in maize bran should be used for human consumption and the production of shortening, similar to Vanaspati, should be started; finally, the price for sesame oil should be raised and that for other oils kept low as an incentive for farmers to produce more sesame seeds and for consumers to use other oils and fats.



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A. Official arrangements

As a follow up to the First Consultation Meeting on the Vegetable Oils and Fats Industry, convened by the United Nations Industrial Development Organization (UNIDO) in December 1977 at Madrid, UNIDO decided to carry out evaluation studies of the vegetable oil industries sector in selected developing countries.

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As part of this project an expert in the production of vegetable oils and fats was sent to Somalia. He took up his assignment of one month on 6 November 1978.

B. General remarks regarding Somalia and its population

Somalia is a big country covering an area of 637,000 km^2 but with only approximately 3.5 million inhabitants (1978), i.e. 5.5 persons per km^2. However, much of the land is arid or semi-arid. The total area is estimated to be distributed as shown in table 1.

Table 1. Distribution of land according to climatic conditions

	Percentage	square kilometers
Potentially arable	12.5	79,000
Suitable for grazing	54.9	350,000
Forest and scrub	13.8	88,000
Other land	18.8	120,000

Out of the approximately 80,000 km^2 of potentially arable land, about 6,000 km^2 are under dry-land cultivation and 2,500 km^2 under irrigation. Another 20,000 km^2 are inter-river land, situated between the only two important rivers of Somalia,

the Shebelli and Juba. In this latter area there is usually sufficient rainfall and good possibilities for irrigation schemes exist.

More than half of the total area is regarded suitable for grazing and cattle raising and/or primitive agriculture, giving a precarious living to the mainly nomadic or semi-nomadic population in these regions. However, severe droughts are occurring in certain years; during the last one from 1973 to 1975, the livestock was considerably reduced. In 1975, the Government arranged for resettlement of, and relief camps for, the population from the drought-stricken areas; these camps were reported to have up to 250,000 inhabitants - an example illustrating the dreadful effect of the drought.

Nevertheless agriculture and cattle raising remains the backbone of the Somalian economy. The agricultural sector is estimated to contribute 40 per cent to the gross national product (GNP), and to employ about 80 per cent of the active population (figures from 1975).

In earlier years the agricultural sector accounted for 55 to 66 per cent of GNP, but the above-mentioned drought and an expansion of the industrial and services sectors have reduced the share of agriculture in GNP. The industrial sector has increased its share in GNP from a very low 2.5 per cent in 1960 to approximately 10 per cent in 1975; the services sector, including wholesales, retailing and transportation, has increased its share to about 15 per cent. The rest of GNP is made up by governmental services such as education, defence etc. The agricultural sector is also of great importance for the Somalian export which consists mainly of animals on the hoof, frozen or canned meat, hides and skins, as well as bananas. It is believed that these exports could be considerably increased by improving the ways of collection of the animals and the marketing facilities.

The population can be divided into three major groups: approximately 60 per cent, or two million people, are nomads or semi-nomads who take very little part in the cash economy; approximately 20 per cent, or 700,000 persons, are settled rural population who until now have been largely self-sufficient in food supplies; and approximately 20 per cent, or 700,000 persons, are urban population who must rely on purchased food. The average <u>per capita</u> income is estimated to be below $US 100 per year. ($US 1 = SoSh 6.23)

I. ACTUALLY CULTIVATED AND POTENTIALLY ARABLE AREAS

A. Actually cultivated areas

According to the department of agriculture, Ministry of Agriculture, the total cropped area in 1977 was 410,000 ha out of which 76,000 ha were used for the cultivation of oil-seeds, i.e. practically only sesame, groundnut and cotton.

At the end of 1978, an advisor of the Food and Agriculture Organization of the United Nations (FAO) to the same ministry estimated the total cultivated area to be about 600,000 ha of which 430,000 ha were used for cropping cereals, oil-seeds and beans, the rest for bananas, fruits and other vegetables. This means that only 7.6 per cent of the potentially arable land which has apparently been grossly over-estimated is really cultivated.

A World Bank report of 1975 gives the following estimates for irrigated land and areas with potential irrigation.

Table 2. Irrigated land and areas with potential irrigation
(Hectares)

District	Irrigated			Potential
	Controlled	Flooded	Total	
Shabelli River	26,900	43,900	70,800	80,000
Juba River	6,000	21,000	27,000	150,000
North	1,500	700	2,200	5,000
Total	34,400	65,600	100,000[a/]	235,000

a/ The department of agriculture's estimate for the total area under irrigation was 150,000 ha in 1978.

These figures seem to indicate that out of the 600,000 ha of cultivated land about 20 to 25 per cent are already irrigated in some way, whereas 75 to

to 80 per cent are under dry-land cropping. It furthermore seems reasonable to assume that the yields are much higher in the irrigated areas than in those without irrigation. Most of the sesame plants and groundnuts are cultivated by dry cropping but the exact percentages grown on irrigated and non-irrigated land are not known. There is also no record of the differences in yield under different conditions of cultivation.

The Shabelli River is already almost fully utilized for irrigation purposes, whereas the Juba River, being the only river in Somalia which carries water during the whole year, is still very much underutilized.

B. Potentially arable land

There is an amazingly high number of irrigation projects (the expert identified at least 15), at various stages: planned, work started or partly completed. It is, however, extremely difficult to judge how much these irrigation schemes will contribute to the supply of oil-seeds for the following reasons:

(a) Most of these schemes have been initiated only during the last few years; since statistics are available at the earliest one year after the harvest, it is still too early to say anything decisive regarding the results;

(b) With most projects it has not yet been decided how many hectares will be used for each crop;

(c) The yield per ha is given as a constant figure for each crop. It is, however, hoped that with the new irrigation schemes the yield will increase;

(d) Many of these schemes will be considerably delayed.

II. PRODUCTION OF OIL-SEEDS

A. Production during the period 1969-1978

The production of oil-seeds during the years 1969-1972 and 1977-1978 is given in table 3. The lack of figures for the period 1973-1976 is due to the fact that the task of elaborating the harvest statistics was in 1971 transferred from the Ministry of Agriculture to the Agricultural Development Corporation (ADC) which also holds a government monopoly for the trading of seeds. In reality, ADC handles only part of the crop which was then shown as the total harvest. The activities of ADC are further described in chapter V.

Table 3. Production of oil-seeds, 1969-1972 and 1977-1978

Year	Sesame			Peanuts in shell			Cotton (whole)		
	Cropped area (ha)	Yield Tons	Yield Average (t/ha)	Cropped area (ha)	Yield Tons	Yield Average (t/ha)	Cropped area (ha)	Yield Tons	Yield Average (t/ha)
1969	53,000	16,000	0.3	2,150	1,500	0.7	700	490	0.7
1970	60,000	18,170	0.3	4,000	2,800	0.7	240	170	0.7
1971	67,000	20,000	0.3	4,300	3,000	0.7	410	286	0.7
1972	96,000	28,588	0.3	5,000	3,500	0.7	3,500	2,447	0.7
1977	70,460	21,138	0.3	1,880	1,350	0.7	4,630	3,240	0.7
1978	88,519	26,556	0.3	2,518	1,763	0.7	3,013	2,109	0.7

Source: Ministry of Agriculture.

The figures indicated in table 3 should be taken with a grain of salt, since it is almost impossible to know exactly whether e.g. 88,519 ha or 88,520 ha under sesame culture were cropped in 1978. For reporting purposes uncertain figures should be filled in with seros, so that in this case the area cropped in 1978 would be 88,000 ha. Also, the average yield given for a certain crop is always the same, which is completely unreasonable. The yield must, of course, vary with the amount of yearly rainfall, the type of irrigation, the methods used for sowing and harvesting etc. As in Somalia sesame is mainly grown as a dry culture crop, the crop figure given for 1972 was certainly due to the fact that there was much more rainfall than in other years. Therefore, the yield was certainly better, say 0.4 t/ha, in which case the cropped area would have been about 70,000 ha, a figure which is more in line with the cropped areas indicated for the other years.

The yields are bad compared to those obtained in many other countries. The Italian organization FAGRARIA s.p.a. reckons that a yield of 1 t/ha of sesame could be obtained and an Indian agricultural specialist was of the opinion that with proper irrigation a yield of 2.5 t/ha could be achieved.

It would, therefore, be of great interest to ascertain to what extent yields in Somalia vary with different conditions of cultivation. This could be done relatively easily by choosing some areas of which the exact size is known and where the yearly crop is weighed. These areas should also represent different conditions of cultivation such as dry cropping (with measurement of rainfall) or irrigation (either controlled or by flood), different methods used for sowing and harvesting etc. Such an investigation could give a clue to the most important factors influencing the yield and perhaps also show that some relatively simple and cheap measures could improve the yield considerably. The same applies to peanuts and cotton seeds where the yields are also low compared to other countries.

Taking all the uncertainties into consideration, the following can be concluded:

(a) The harvest of sesame seeds seems to have been relatively constant from 1970-1977 with about 20,000 t/year. Only 1972 was an exceptionally good year. Possibly the figures given for 1978 indicate the beginning of improvement due to the many new schemes of cultivation and irrigation, but it is too early to be certain of this;

(b) For groundnuts, the harvest in 1977 and 1978 was only half of that in 1971 and 1972. Again the 1978 figures may indicate an improvement of the situation;

(c) The cotton crop has not shown any appreciable increase since 1972, in spite of the fact that the cultivation of cotton has a very high priority in the Government's plans, because most of the cotton linters used in the local textile industry are being imported.

B. Possibilities of increasing the oil-seed production

There exist two projects for the development and certification of oil-seeds, both run by FAO, one at Afghoi and the other at Uar-Mahan. The expert visited both places and found that the latter project, financed by the Government of Iraq, was not yet working whilst the experimental station in Afghoi, which was initiated in 1972, had been in operation since 1976. The estate comprises 400 ha of which only 80 ha are at present under culture. Not less than 28 different kinds of plants are cultivated and it is, therefore, easy to understand that the results obtained for each crop are still not conclusive.

A lot of research seems to have been carried out on maize and the expert was informed that the average yield per ha, which is usually only 0.8 t in the country and 1.4 t in better areas, could be raised to 3 t/ha by proper cultivation methods. The yield of sesame seeds, which normally averages 0.3 t/ha could be increased in Afghoi to 1.2 t/ha and for peanuts it increased from 0.7 t to 2.1 t/ha.

The problem is now to repeat the same excellent results obtained in an experimental station, where all factors can be properly controlled, in areas cultivated by inexperienced farmers. The Afghoi experimental station is carrying out an education programme for the farmers, but this is of course a long-range undertaking and it will take many years before appreciable improvements in the average yield can be obtained. It is, however, said that simple improvements in sowing and harvesting methods as well as in weed control could increase the yields considerably. To reach the above-mentioned top figures, expensive irrigation schemes and the use of fertilizers and insecticides, which would have to be imported, would be necessary.

As the conclusions drawn from only one experimental farm are not sufficient to judge the situation in the whole country, a scheme as proposed in chapter II, section A, should be set up to complement the results from Afghoi.

The low yield of oil-seeds per area cultivated is of course also the reason why farmers are complaining about insufficient income. It is obvious that a considerable increase in oil-seed production only by enlarging the area under cultivation is out of question. To be self-sufficient in oil-seeds Somalia would have to triplicate the area of 75,000 ha at present under cultivation; but the same result could be obtained by doubling or tripling the yields/ha by relatively simple methods. However, as already mentioned, such a programme will take considerable time and therefore an increase of oil-seed crops by about 3,000 t/year over the next three years seems to be an optimistic forecast.

C. Other possible raw materials

There are of course other oil-seeds which could be grown in Somalia. Sunflower-seed has been tried, with disappointing results because the seeds were eaten by birds. Safflower-seed has been grown on an experimental basis and has not yet been cultivated at a larger scale. There are some coco palm trees in the southern part of the country but no attempts have been made to cultivate them in plantations or even to collect the nuts and to produce

copra by drying the meat. There is already a considerable production of maize, about 60,000 t/year, and further 50,000 t are being imported. The maize is polished in local flour mills and approximately 20 per cent of bran (about 26,000 t) are obtained. This bran could be degerminated, the germs constituting 25 per cent of the bran and containing about 25 per cent of oil which could be extracted in continuous screw presses. There is thus a potential source of 1,000-1,500 t of maize oil which at present is not utilized, because the mills have no equipment to degerminate the bran. Such equipment could, however, easily be installed.

The slaughterhouses constitute a potential source for animal fat, but as H.A.L. Morris has pointed out in his report (see reference in annex II), one of the main problems is that more than half of the animals are slaughtered in widely dispersed locations lacking facilities for fat rendering or bone extraction and where hygenic conditions would usually not permit the eventually rendered fat to be used for human consumption. It could, however, be used for technical purposes and especially for soap-making. The tallow produced in the bigger slaughterhouses, especially in the Kismayo plant, which has complete equipment for by-product processing including fat rendering, could possibly be used as human food mixed with vegetable oils.

There are plans to establish a fish-meal and fish-oil factory, as the catch in the Indian ocean seems to offer good possibilities. The plans are based on a catch of 70,000-100,000 t of fish per year of an unknown fat content, but scarce harbour facilities, the lack of trawlers and skilled fishermen have delayed the decision.

If local fish-oil was going to be used for food, Somalia would need a hardening plant, which at the moment does not exist in the country.

III. PRODUCTION OF VEGETABLE OIL

A. The State oil mill

There is only one larger oil mill and oil refinery in Somalia, namely the government-owned oil mill at Mogadiscio. The factory was started in 1976, using machinery from some former private companies. This equipment is a rather unusual collection consisting of the following items:

Screw presses

2 Italian make Macar, each	5 t/24 h	
1 Italian make Breda	10 t/24 h	
1 Italian make Breda	3 t/24 h	used mainly for repressing of cake
1 Old Rose Downs	6 t/24 h	
1 New Rose Downs	20 t/24 h	

Total daily capacity approximately 40 t = 12,000 t/year
Capacity used approximately Only one third due to lack of seeds

Other equipment

Small batch refining and bleaching plant 5 t/day
Under installation: Rose Downs batch deodorizer 25 t/24 h

Most of these machines are up to thirty years old. Especially the equipment for delinting of cotton seeds, for dehulling and for milling the seeds is rather primitive.

As shown in table 4, the yields are equally poor. In a modern mill with screw-pressing and proper pre-treatment of the seeds, results as indicated in table 5 can be expected.

Table 4. Production of State oil mill at Mogadiscio, 1976-1978

	1976				1977				1978			
	Cake	Oil	Total seeds	Yield (%)	Cake	Oil	Total seeds	Yield (%)	Cake	Oil	Total seeds	Yield (%)
	tons				tons				tons			
Sesame	357.8	121.4	479.2	25	3,477.0	1,341.7	4,818.7	28	2,975.2	1,028.4	4,003.6	25
Copra	742.2	400.0	1,142.2	35								
Groundnuts	16.7	4.9	21.6	23								
Cotton	212.5	12.6	225.1	5.6	301.2	13.2	314.4	4.2				
Total	1,329.2	538.9	1,868.1	-	3,778.2	1,354.9	5,133.1	-	2,975.2	1,028.4	4,003.6	

Table 5. Yield of oil by expeller pressing in a modern mill

Type of oil seed	Oil content of seed	Oil content of cake	Yield of oil	
			in % of seeds	in % of [illegible] oil cont.
Copra	65	5	60	92
Groundnuts (decorticated)	50	5	45	90
Sesame	50	5	45	90
Cotton (decorticated)	20	5	15	75

The figures given in table 4 are valid for seeds with a water content of 7-8 per cent which is obtained when wet seeds are dried and then stored in ventilated and temperature-controlled silos.

The low yields in the Mogadiscio oil mill may be due to:

(a) A higher water content of the seeds;

(b) Improper pre-treatment and milling of the seeds;

(c) Worn-down screws in the presses.

On the other hand, the quality of the oil seems to be surprisingly good. The sesame oil is said to have only 1 per cent of free fatty acid (FFA) It is sold to the consumer without refining and is the oil traditionally preferred by the population. The oils from peanuts and cotton seed are reported to have 2 per cent FFA and are refined and bleached. Cotton-[illegible] which is dark brown or nearly black and has an unpleasant smell and taste, is usually refined. It is, however, difficult to understand why it should be necessary to refine the peanut oil, which in many countries as for instance in China, is consumed unrefined. The Somalian consumer is, however, said to object to the yellow colour of the peanut oils compared to the nearly white colour of sesame oil.

In 1976, copra was imported from Mozambique. The oil mill liked to work with copra because of the better oil yield as compared to the other seeds. During the last two years copra was for reasons unknown to the expert no longer imported. Coconut oil was refined and deodorized because the consumer objected to the characteristic flavour of the oil which is, however, highly appreciated in a country like Indonesia.

The low FFA content in the crude oils is due to the fact that the seeds are coming to the factory in small lots, which are immediately processed. Should larger quantities of seeds be available in the future, especially during the harvest, which may well exceed the amount which can be immediately processed, improved storing facilities for the seeds will have to be provided. A first approach could be a roofed shelter, but if the seeds have to be stored for a longer time, a ventilated silo would be preferable because of the high humidity of the atmosphere.

Steps to increase the oil yields by improving the pre-treatment and the milling should be taken as soon as possible. It is recommended that the Somali oil mill approaches a company specialized in this field, e.g. Bühler Miag, who have already installed some equipment in Somali flower mills and who have a representative at Nairobi who visits Somalia several times a year.

As mentioned before, the screw presses are utilized to only 30 per cent of their capacity. As it is unlikely that a sufficient quantity of seeds will be produced inside the country for several years to come, the only possibility to increase the output of the pressing plants is to import raw material of which copra, as already imported in 1976 from Mozambique, would be the obvious choice. Copra could be obtained from Indonesia, Sri Lanka and other countries. The amount needed in order to fully utilize the State oil plant is approximately 5,000 t/year and should decrease as more local seeds become available. It would evidently be of economical advantage for Somalia to import raw material instead of refined oil, firstly because the full capacity of the State oil mill could be used; secondly because both the oil and oil cake could be used for local consumption, as human food and as cattle fodder; and thirdly, because less foreign currency needed for the importation of the raw material than for the importation of refined oil.

The same arguments are valid for the Rose Downs deodorizer under installation. The capacity of this equipment is above 6,000 t/year, which is about six times the present output of the presses and three times their output if they were fully utilized. Here again, the obvious solution would be to import crude oil, for instance coconut oil or palm oil and to refine it in the country. The economical advantages would be the same as mentioned above for copra. If crude oil is going to be imported, storing tanks for the oil must be provided.

It is true that the capacity of the existing alkali refining plant is too small for refining the 6,000 t of oil per year which would be necessary to feed the deodorizer, but a small continuous neutralization plant with a

capacity of 50 t/day would fill this gap. In such a plant, oil and caustic are continuously pumped to a mixer and then to a centrifuge where the oil is separated from the soap-stock. The oil is then water-washed in order to remove the last traces of soap; this can easily be done in the same centrifuge. In this case the capacity of the installation would be halved, i.e. 25 t/day, which corresponds exactly to the capacity of the deodorizer.

Palm oil is a semi-solid oil; in Malaysia the oil is fractioned into a fluid and a solid component, which can be bought separately. If the colour of the palm oil is a real obstacle for its sale on the Somali market, neutralized and bleached fluid palm oil could be imported and only deodorizing would then have to be carried out in Somalia.

The population of Somalia is accustomed to use solid animal fat for frying. It should, therefore, be possible to develop a market for products like Vanaspati which is very much used in India and Pakistan but also in the Arab countries, or for shortenings as used in the United States. These products do not contain water and are, therefore, much more stable in tropical climates than butter or margarine which contains about 20 per cent of water. They are made of a mixture of fluid and solid fats, as e.g. the two above-mentioned fractions of palm oil. Melting point and texture can be adapted to the prevailing climatic conditions and the taste of the consumer. These fats are used to a great extent in the baking industry, especially for making biscuits and cakes.

B. Privately-owned smaller mills

There is a considerable number of smaller mills in Somalia, many of which are operated by dromedaries and others with hydraulic presses and screw presses. These mills process mainly sesame seeds and only some groundnuts. Table 6 contains further information regarding the number and the production of mills.

Table 6. Production of privately-owned smaller oil mills, 1971

Type of plant	Number	Seeds crushed (t)	Supposed yield (%)	Supposed amount of oil produced per year (t)
Mechanical presses				
at Mogadiscio	70	5,600	40	2,240
in other municipalities	40	1,600	40	600
Dromedary-operated presses	520	4,000	40	1,600
Total	630	11,200		4,440

Source: Citaco S.p.a., "Survey of the edible oil supply and demand in Somalia" (Rome, 1971).

Since 1971 the situation in the private oil seed milling sector seems to have changed. In a technical report on project DP/SOM/72/007 dated January 1976 is stated that Somalia posesses about 150 small Japanese screw presses provided with filters, each machine with a capacity of 1 t per 8-hour shift. This seems to indicate that many of dromedary-driven mills have been replaced by Japanese presses and that these also have a higher capacity than the State oil mill. On the other hand, it is said in an FAO report on project TF/SOM/501 (IRQ) NECP that in 1977 there were 250 of these mills in Somalia and that the capacity of each press was only 0.5 t during 12 working hours.

The first figures would indicate a total daily capacity for the whole of Somalia of 150 t/8 h, the second, a capacity of about only 80 t/8 h. In order to strike a balance between these conflicting figures, the expert assumed that a total capacity of approximately 100 t for each 8 h working day is available; this capacity could be increased by 50 per cent by working 12 h per day. However, in view of the fact that the supply of seeds to the smaller mills is irregular and meets their capacity probably only during the two harvest seasons, it is most likely that these mills are operating for only 200 working days per year which would correspond to a yearly capacity of 20,000-30,000 t, depending on the number of hours worked per day.

The number of the dromedary-operated mills which have an estimated capacity of 40 kg/day has probably been reduced to the extent that they are of no importance for the total milling capacity. A last comment has to be made on the yield: since the government-owned oil mill, having the best equipment in the country, yields only 25 per cent of oil from sesame seeds and groundnuts it is unrealistic to assume a yield of 40 per cent for the smaller mills. The real figures are probably somewhere between 20 and 25 per cent. As shown in table 3, the best crop ever recorded was about 30,000 t; usually it is somewhat lower. It appears that this crop and even a better one could easily be processed by the State oil mill and the private mills together, especially in view of the fact that the State oil mill is underutilized, as most of the seeds go to the private mills who sell the oil on the black market at prices which are 50-100 per cent above the official price.

IV. CONSUMPTION OF VEGETABLE OILS

As can be seen from the preceding chapters, sesame seed is by far the most important source of vegetable oil. The sesame seed crop varies from year to year; in 1978 it was about 26,000 t. There is a small crop of peanuts, and some cotton seed is also available. At the present stage of development of the Somalian year, agriculture, the total crop of oil seeds is between 25,000 and 30,000 t/year. As stated in chapter III, the oil yield from this crop is not higher than 25 per cent; therefore a total amount of 6,000-7,000 t of oil is available for human consumption. As can be seen from table 7, there is, in addition to the locally produced oil, a considerable amount of vegetable oil being imported and these importations have been steadily increasing over the past years.

Table 7. Importations of vegetable oil to Somalia, 1972-1977

Year	Quantity	Value (million SoSh, c.i.f.)
1972	3,733	9,741
1973	2,585	10,770
1974	3,004	19,761
1975	8,450	36,657
1976	9,521	36,759
1977	11,974	58,362

Source: National Agency of Trade, Mogadiscio.

Thesfigures given in table 7 include direct grants coming mainly from the United States and the European Economic Community (EEC) and which amounted to approximately 500 to 600 t in 1978. Small quantities of olive oil are also imported. It is evident that the importation of vegetable oil is a considerable drain on Somalia's resources of foreign currency. In 1977 cereal and vegetable oil were the two biggest items on the list of imported foodstuffs. Somalia, therefore, has every interest in cutting down its importations of vegetable oils. When actual local production and imports are added together, approximately 18,000 t of oil are available for human consumption corresponding to 5 kg per person and year. This is, compared to the consumption in other countries, a very low figure and an increase of at least 0 per cent to 7.5 kg per person and year is highly desirable for dietetic reasons. It

should, however, be remembered that a large part of the population is nomadic and gets most of the fat required from milk and animal fat; the consumption of vegetable fats by the settled population is therefore somewhat higher.

As only one third of the actual consumption of vegetable oil is produced from local seeds, and since it will take a long time to increase the crop significantly, Somalia will have to continue to import oil for many years to come. It is, therefore, important to have the price under control. This aspect will be further discussed in chapter V.

V. DISTRIBUTION SYSTEM AND PRICING POLICY

The marketing systems of agricultural products is controlled by government-owned and operated by autonomous marketing agencies. Two organizations, the Agricultural Development Organization (ADC) and the National Trade Agency (ENC), both attached to the Ministry of Commerce, are responsible for the marketing of basic staple foodstuffs.

ADC is a monopoly-type organization, established in 1971 (but not operative until 1973) for the purpose of purchasing all locally-produced staple foods such as maize, sorghum, sesame seeds and groundnuts from farmers at fixed prices and selling them to wholesalers, oil mills and consumers again at fixed prices.

ENC is another monopoly-type organization for the importation, storage and distribution on a regional level of foodstuffs such as wheat, flour, rice, edible oil and sugar. ENC also buys locally-produced edible oils from the oil mills (in practice, only from the State oil mill) and sells them to local government's municipalities and to retailers. The price fixed by the municipalities was in 1978 SoSh 8,522.6/kg of oil bought from the mills, SoSh 8,720 for sale to the municipalities and SoSh 9,000 for sale to the consumers.

However, as can be seen from table 8, ADC does not really control the market for oil seeds. In spite of its monopoly, it never handled more than 50 per cent of the crop and some years considerably less. What happened after the establishment of the ADC was evidently that the farmers sold the seeds to the private mills at a higher price than the one fixed by ADC and that the mills sold the oil to the consumers at a price about twice as high as the one fixed by ENC. It is a general belief that the price paid to Somali farmers for oil seeds is too low as compared to other crops. Not being an agricultural economist and not knowing the costs involved in the different crops, the expert is not in a position to confirm or to reject this view, but it is obvious that with an increase of the yield per hectare under culture, the income of the farmers would improve.

It is, however, interesting to compare the economy of oil extraction by mechanical screw presses in the United States and in Somalia.

Table 8. Total local production of oil-seeds and quantities purchased by ADC, 1972-1979

Year	Sesame seed			Groundnuts			Cotton seed		
	Total production (t)	Purchased by ADC		Total production (t)	Purchased by ADC		Total production (t)	Purchased by ADC	
		Tons	Percentage		Tons	Percentage		Tons	Percentage
1972	28,558	-	-	3,500	-	-	2,447	-	-
1973	20,000[a]	12,431	60	2,500[a]	700	28	2,500[a]	-	-
1974	20,000[a]	4,556	23	2,000[a]	1,000	50	2,500[a]	450	18
1975	20,000[a]	8,000	40	2,000[a]	1,000	50	2,500[a]	450	18
1976	20,000[a]	7,097	35	1,500[a]	-	-	2,500[a]	-	-
1977	21,130	9,782	49	1,350	600	44	3,240	-	-
1978	26,556	18,000[b]	67[b]	1,763	1,000[b]	56	2,109	-	-
1979	-	25,500[b]	-	-	-	-			

a/ Approximate.

b/ Forecasts.

As can be seen from table 9, an oil mill in Somalia pays approximately the same price for the groundnuts as a mill in the United States but the yield of oil is much smaller. The value of the cake is also nearly the same in the two countries. However, in spite of the low oil yield obtained in Somalia, the percentage of income from the oil produced by the mill is the same as in the United States because the price for oil fixed by the Somali Government is nearly twice the world market price.

Table 9. Economy of oil extraction in the United States and in Somalia at 1976 prices

Product	United States					Somalia		
	Price per ton		Yield (kg)	Income for mill		Price per ton (SoSh)	Yield (kg)	Income for mill (SoSh)
	$US[a]	SoSh[a]		$US	SoSh			
Groundnuts, decorticated	416	2,600				2,800[b]		
Oil	741	4,630	450	335	2,100	8,526	250	2,132
Cake	176	1,100	550	96	600	1,000	750	750
Total income for mill				431	2,700			2,880
Percentage of income from oil				76	76			77

a/ The official exchange rate used is $US 1 = SoSh 6.25.

b/ The price paid by ADC farmers for peanuts in shell is SoSh 1,250/t, and they are sold to the oil mills at SoSh 1,610/t. The price given above for decorticated peanuts has been calculated under the assumption that the yield of nuts is 55 per cent.

The production of peanut oil by mechanical extraction in screw presses was chosen as an example because the prices for raw material and finished product were readily available when writing this report. Calculations for sesame seeds would certainly give a similar result.

If the extraction rate in the State oil mill at Mogadiscio were raised to the same level as in mills in the United States, this mill would have an extra income of SoSh 1,500 per ton of seed processed. Another striking difference between Somalia and the United States is the fact that in Somalia all oils are sold at the same price, whereas in countries with a free and competitive market there are considerable price differences (see table 10).

Table 10. Prices for crude oils on the world market and consumer prices for oil products in the United States and in Somalia, 1976

Type of crude oil	World market price/t, c.i.f.		Type of consumer product	Consumer prices/kg		
	$US	SoSh		United States $US	SoSh	Somalia (SoSh)
Palm oil	400	2,560	Cooking oil from soya or cotton	0.85	5.30	9.00
Coconut oil	480	3,000	Cooking oil from peanut or sesame	1.65	10.10	9.00
Soya bean oil	550	3,450	Shortening	0.80	5.00	-
Groundnut oil	741	4,600	Margarine	0.88	5.50	-
-			Butter	2.52	15.80	-
Copra	275	1,713				

As long as the supply of local raw materials is insufficient and as long as a fixed prices for all oils are in vigour, Somalia can only try to import the cheapest possible raw material.

When importing copra at $US 275/t, the local oil mill would, at present level of yield, obtain 350 kg of oil and 650 kg of cake which are sold at SoSh 8,522/t and SoSh 1,000/t respectively. The total income for the mill would consequently be SoSh 3,620/t of copra or SoSh 13.2 per dollar spent on import. If the yield in pressing were improved to the usual figure of 550 kg of oil and 450 kg of cake per ton of copra, the total income for the mill would be SoSh 5,130/t of copra or SoSh 18.6 per dollar spent on import.

If crude copra or palm oil were imported at an average price of $US 440/t, the income for the mill would be SoSh 8,522/t of oil or approximately SoSh 19.4 per dollar spent on import. The costs of refining, bleaching or deodorising of the oil are not taken into account in this case.

The conclusion is that, as long as the yields in the State oil mill remain as low as at present, it is advisable to import crude oils rather than copra, unless the copra can be purchased with donated money. As already mentioned, the Somali consumer has a strong preference for sesame oil and is even willing to pay the high price at which it is sold on the black market, instead of buying other types of oils or fats. The result is that most of the sesame crop is processed by the private mills leaving the State oil mill underutilized. The obvious solution to this problem is to resort to a pricing policy that would stimulate the consumption of certain oils and fats.

If, for instance, the price for sesame oil would be fixed at a level close to that paid on the black market - e.g. SoSh 15 - and the price of other oils kept constant, this measure would bring about the following advantages:

(a) The Government could pay higher prices for the seeds to the farmers, thus giving them an incentive to produce more, which is of great importance as long as the local supply is insufficient;

(b) The private mills would have difficulties in obtaining sufficient seeds and could sell only less oil at black market prices;

(c) The State oil mill could use a much higher percentage of its capacity;

(d) Selling other oils and fats at a lower price than sesame oil would slowly induce the consumer to accept other types of fats such as animal fat which is obtained from local raw material sources, or some simple sort of shortening which could be made from the cheapest oil available on the world market, palm oil, or partly from animal fats.

It can also be concluded that there is practically no market in Somalia for more sophisticated products like margarine. There is therefore no reason to establish new plants for fat and oil processing before the supply of raw materials has reached a much higher level than today. As the amount of cake available is also small and, on top, produced in the State oil mill and the many smaller private mills scattered all over the country, it also seems uneconomical to establish a factory for the manufacture of compound cattle fodder; the cake may as well be used as such for feeding the animals.

VI. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

1. The main problem of the oil and fat industry in Somalia is an insufficiency of local seeds. The country's seed production could certainly be considerably increased, partly by expanding the area under cultivation but especially by improving the yield per hectare. It is recommended high priority be given to the cultivation of oil seeds in the Government's agricultural development schemes.

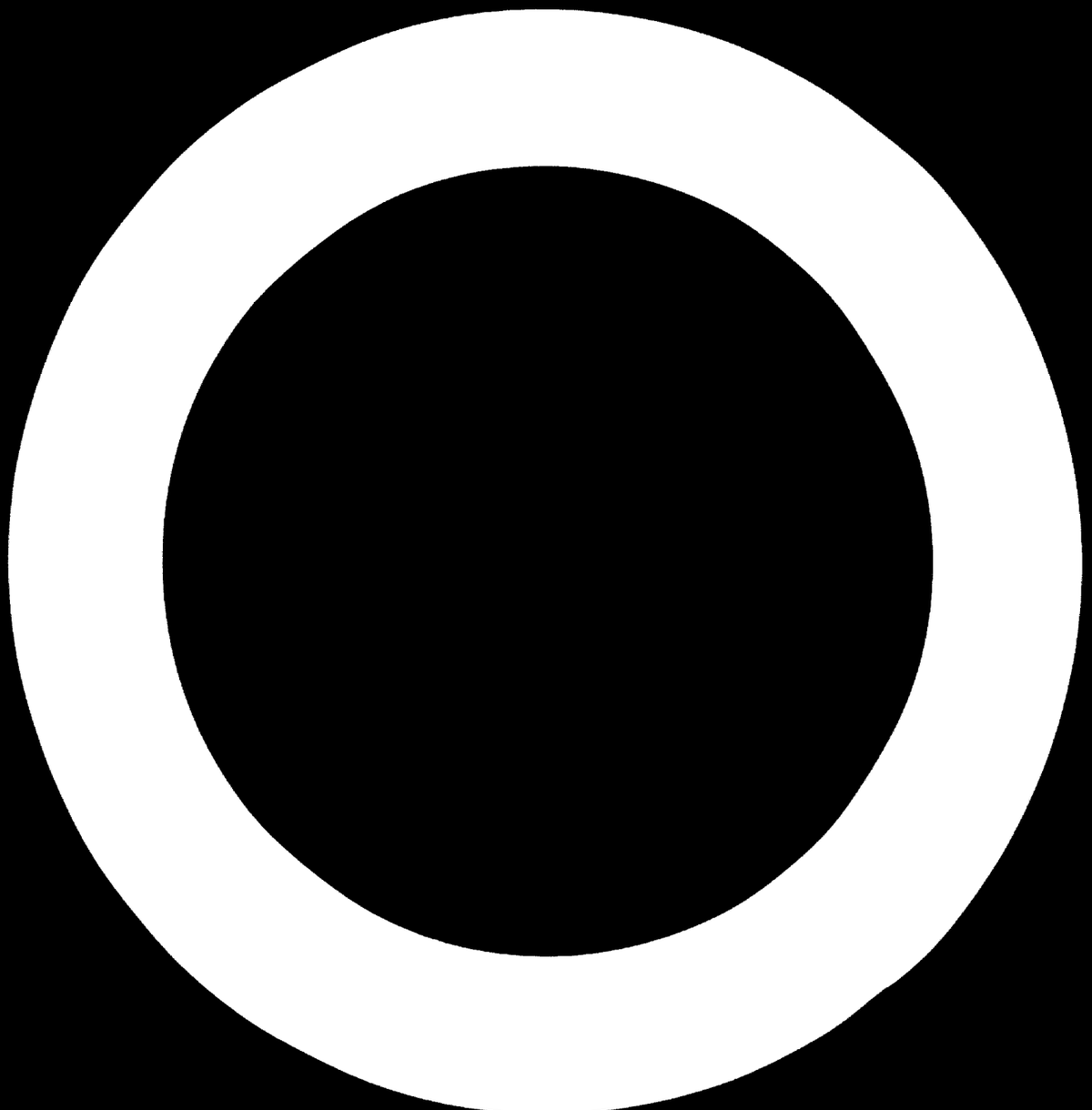
2. The only existing complete oil mill is the State oil mill at Mogadiscio. Some of its equipment is rather old and the yield of oil is consequently very low. New equipment for pre-treating of the seeds, before pressing, should be installed and the existing screw presses should be kept as effective as possible by regular exchange of the worms and of other spare parts.

3. As it is not to be expected that the State oil mill can be supplied with sufficient local raw material in the near future, probably not before 1985, it is suggested that raw material be imported in order to utilize the full capacity of that mill. The obvious choice would be copra, coconut oil and palm oil or its fractions. The importation of raw materials would necessitate the installation of suitable storage facilities. The existing small-scale alkali refining plant should also be expanded, e.g. by installing a small continuous caustic refining plant.

4. There are two sources of raw material in the country which at present are underutilized or not used at all. One is animal fat from the slaughterhouses, which, if it were of good quality, could be used for human consumption, possibly mixed with edible oil. The second one is maize bran. The germs, containing the oil, could be separated and the oil could be extracted in screw presses, similar to those already existing. Equipment for degerminating the bran should therefore be installed in the bigger flour mills in the country.

5. The only new product not yet manufactured in Somalia which seems to have a reasonable market is some kind of shortening or Vanaspati. Since this type of fat is easily adaptable to the climatic conditions of a country and to the taste of a consumer it production in Somalia is recommended.

6. The present pricing policy, according to which all oils, with the exception of olive oil, are sold at the same price should be changed. A higher price for sesame oil, which is preferred by the Somali consumer, and a lower price for other oils would encourage the farmers to produce more sesame seeds, limit the activities of the smaller private mills and induce the consumer to use other oils and fats.



Annex I

PERSONS MET DURING THE MISSION

UNDP field office, Mogadiscio

O. Svennerik, Resident Representative
H. H. Hirad, Senior Programme Assistant
J. Robertson, FAO Senior Advisor

Ministry of Industry

Mussa Dude Samantar, Director General
Aden Amin Awil, Director of Industrial Management
C. Yakoub, Technical Director
Dr. Tuad Abdel-Sayed Girgis, Project Manager of DP/SOM/72/007
Kermil Bird, FAO Advisor to the Ministry of Agriculture

Ministry of Agriculture

Mr. Dugsiye, Acting Director General
Mr. Prasad, FAO Advisor

Agricultural Development Board (ADC)

Ahmed Ibrahim Tani

National Trade Agency (ENC)

Rashid Cabdioraxman
Mohamed Abu Hughe
Mohamed Salad Arale

Delegation of the Commission of the European Economic Community (EEC)

Jean de Ryckman de Betz, Counsellor
Arthur Moeller, Advisor

Control Planning Commission

Nur A. Wahelie, Director of Statistics
Paul Knesević, United Nations Advisor (Bird)
R. Baldwin, FAO Advisor to the Government
Mr. Beccari)
Mr. Papa) FAGHARIA S.p.A.
Dr. Calamita)
USAID Somalia

USAID Somalia

P. Palomba, Counsellor
Milkton W. Lau, Agricultural Development Officer
G. Nelson, Agricultural Advisor

Afghoi Experimental Seed Station, Afghoi

Wur Hadji Déré, General Manager

Annex II

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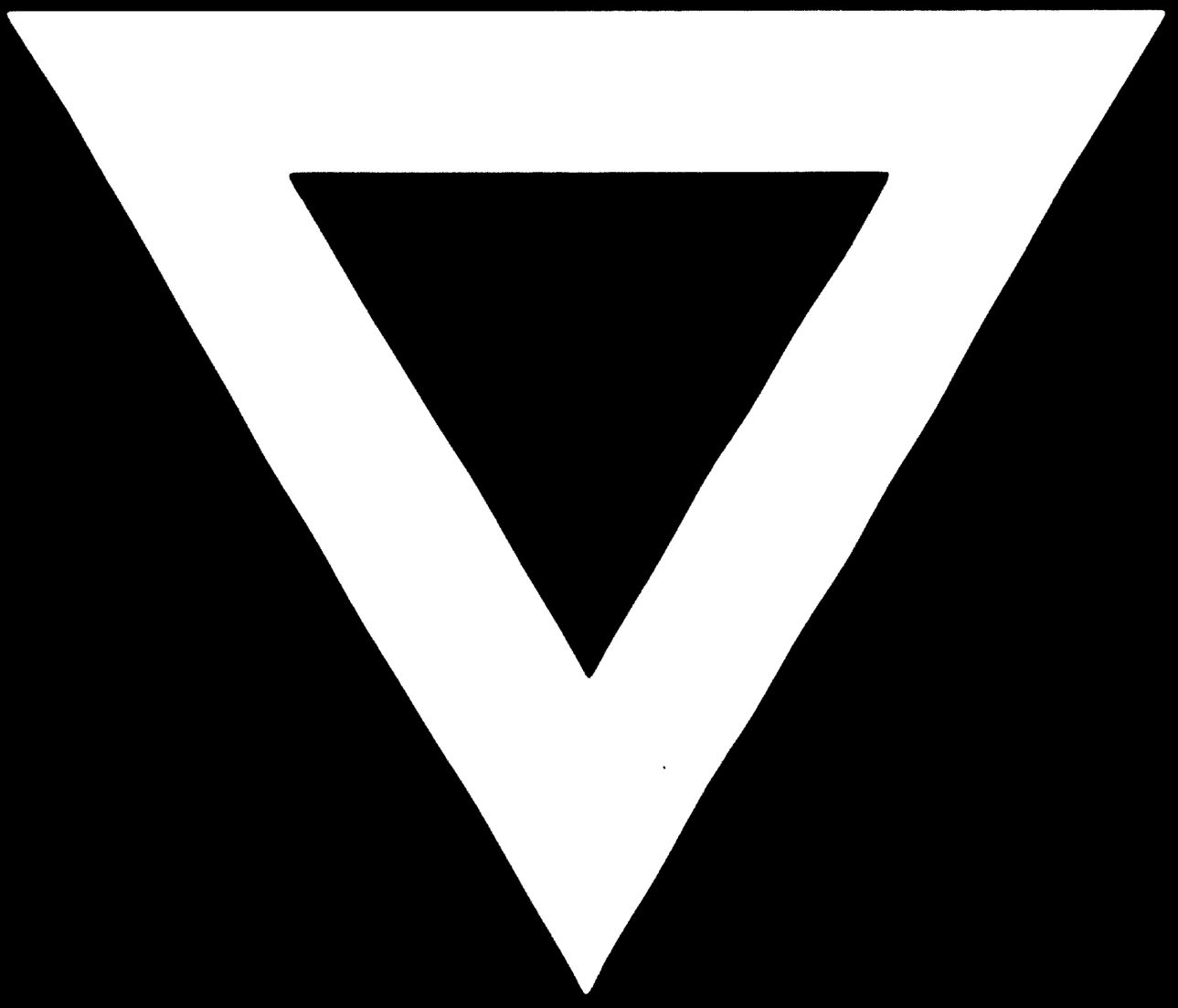

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