SOMALI DEMOCRATIC REPUBLIC
MINISTRY OF NATIONAL PLANNING

JOWHAR SUGAR ESTATE

Feasibility Study for Rehabilitation

Final Report

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APRIL 1984

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CHAPTER 1

ACTUAL EMPLOYMENT SITUATION AT SNAI/JOWHAR

1.1 Employment Figures

Since 1969 the number of permanent employees has been rather stable; somewhere around 1 700 persons in total. It was at its lowest in 1970 (1 420 employees) and highest in 1977 (1 913 persons).

The fact that the Personnel and Management Department was only created in 1975 (constantly numbering approximately 320 employees from them on), did not result in an increase of the staff's grand total since some other departments have been reorganised.

As shown in Table Nr VI.1.1, the relative importance of the sugar factory in the capacity of employer has been constantly declining from 1969 (approximately 50%) to 1982, and has recently employed only one third of all the permanent staff. The role of the Agricultural Department has remained basically the same throughout the years observed, (always numbering approximately 30% of employees).

Management and Administration have undergone a significant increase: from 17% (1969) to 26% (1982), and eventually reaching 33% (1977).

The Commercial Department has kept its share in employment rather constant at around 7% of the total.

For the presentation below, the different managerial and administrational departments have been compiled into one single category.

As far as the employment situation in the Agricultural Department is concerned, the figures given in Table VI.1.2 were provided (referring to the year of 1982).

Next to permanent employed staff casual labour plays an important role at SNAI/Jowhar. Since the factory itself does not employ casuals any more, part time workers are to be found on the Estate only, engaged for activities such as weeding, cutting and loading. To some extent casual labour is also used in irrigation.

According to the information provided by SNAI Agricultural Department (June 1983), a certain quantity of unqualified labour is needed throughout the entire year (weeding, cleaning channels, irrigation), representing a demand for approximately 1 500 persons.

Peak demand arises in the campaigns, when a supplementary labour force of approximately 1 500 to 1 800 persons should be available. These figures are extremely high if compared with international standards when related to the service concerned and the actual tonnage of output per persons employed. This poor ratio can only be explained by the low density and quality of the cane, the poor standard and conditions of the technical equipment, low quality of the working tools and a very low working performance of the casual labour recruited.

Recently, i.e. in the past five to seven years, SNAI/Jowhar has met severe problems in recruiting the necessary manpower to run the cane production and the harvesting properly. Therefore the main objective of this part of the study

TABLE VI.1.1

Employment Figures and Percentages SNAI - Jowhar, 1969 to 1982 according to Departments

Year	I Factory		II Agricultural Department		III Commerce Department		IV Management and Administration		Total
	Total	%	Total	%	Total	%	Total	%	
1969	809	49	451	28	99	6	286	17	1 645
1970	578	41	511	36	82	6	249	17	1 420
1971	714	42	481	28	79	5	423	25	1 679
1972	674	40	564	33	96	6	367	21	1 701
1973	676	39	564	32	77	4	434	25	1 771
1974	688	40	507	30	77	4	449	26	1 721
1975	674	38	582	33	78	4	454	25	1 788
1976	673	39	533	30	82	5	460	26	1 748
1977	651	34	540	28	96	5	623	33	1 913
1978	667	36	586	31	165	9	450	24	1 868
1979	669	35	577	31	142	8	493	26	1 881
1980	655	34	579	30	144	8	526	28	1 904
1981	586	33	581	33	125	7	476	27	1 768
1982	642	35	581	32	125	7	480	26	1 828

Source: Personnel Department/SNAI.

TABLE VI.1.2

Permanent Staff, Employed by Agricultural Department Management and Field Staff Units

Unit	Number of Staff Members
Farm (I)	31
Farm (II)	27
Farm (III)	42
Farm (IV)	32
Farm (V)	34
Farm (VI)	32
Farm (VII)	23
Farm (VIII)	23
Farm (IX)	25
Sub-total Farms	269
Transport Unit	228
Irrigation and Drainage Unit	80
Workshop	17
Experiment and Development Unit	47
Total	641

Source: Personnel Department/SNAI 7th June 1983.

is to describe the actual situation in the area particularly with regard to its work force potentials. The reasons for SNAI's constraints in recruiting casual labour are to be clarified; outlooks and possible solutions to the problem, will be put forward.

1.2 Income Situation

The income situation on both sides, permanent staff as well as casual labour, is actually very poor. The following Table VI.1.3 compares the respective salary expenditures for both categories in the period of 1969 to 1982.

TABLE VI.1.3

Totals of Personnel Employed (Permanent and Casual) and Respective Salary Expenditures, Years 1969 to 1982 (in Somali Shillings)

Year	Permanent staff		Casual labour		Total salary expenditure
	Employed	Paid	Employed	Paid	
1969	1 645	6 454 798	3 567	4 899 593	11 353 585
1970	1 420	7 217 516	2 963	4 642 899	11 860 355
1971	1 697	7 311 341	3 737	4 611 530	11 922 891
1972	1 701	7 107 411	3 769	4 530 072	11 637 482
1973	1 751	9 082 930	3 750	5 868 699	14 951 590
1974	1 721	8 078 536	3 552	6 192 920	14 271 476
1975	1 788	10 377 933	4 536	7 555 472	17 933 465
1976	1 748	10 730 361	3 820	6 696 433	17 426 794
1977	1 913	12 050 586	3 528	5 998 584	18 049 171
1978	1 868	14 710 158	2 910	6 494 507	21 204 660
1979	1 818	14 530 748	3 879	8 120 231	22 650 980
1980	1 904	14 617 089	3 994	7 597 142	22 214 232
1981	1 768	15 674 031	3 816	8 518 011	21 192 043
1982	1 828	17 675 212	3 900	10 407 629	28 282 841

Source : SNAI/Jowhar, Personnel Department, June 1983.

As far as the above table is concerned it should be noted that for permanent staff the salary expenditures have increased (from 1969 to 1982) to 2.74 times the value of 1969 (referring to 1 645 employees in 1969 and 1 828 in 1982), whereas for casual labour the increase for the same period was 2.12 times, the most significant step being that from the year of 1981 to 1982 (referring to 3 567 labourers in 1969 and 3 900 in 1982). The overall increase of salary expenditures in the period observed is 2.49 times the amount of 1969.

In order to look at the different salary levels of the different skill groups, reference was made to the World Bank Agricultural Reviews (1982) quoting SNAI figures of 1976.

In order to compare the situation of 1976 with the present, the Personnel Department has provided the respective information for 1982.

If the information from Table Nr VI.1.4 is compared with Table Nr VI.1.3 we may state that whereas the total salary expenditures for permanent staff have increased by 65% from 1976 to 1982, only one group of employees (agronomists)

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Salary Levels for Skill Groups SNAI/Jowhar
Years of 1976 and 1982

	Occupational group	Average gross monthly earnings 1976	1982	Increase %
1.	Unskilled labour (plantation)	200	280	40
2.	Unskilled labour (factory)	315	416	32
3.	Semi-skilled labour in the factory and the field	600	695	16
4.	Skilled artisans			
	- electricians	690	820	19
	- mechanics	780	882	13
	- boiler men	815	920	13
	- refiners	510	725	42
5.	Technicians			
	- engineers	2 350	2 600	10
	- agronomists	1 575	2 765	75
6.	Administrative and clerical staff			
	- accounting officers	795	920	15
	- middle grade clericals	693	762	10
	- low grade clericals	635	655	3
7.	Managerial staff			
	- heads of service	1 650	1 765	7
	- directors of departments	2 675	2 820	5
	- general managers	3 900	4 040	4

Sources : World Bank, 1982, SNAI Personnel Department, 1983.

have received a significant rise in salary (75%) with most of the staff members only having a rise of somewhere between 15 to 20%. This gap between formal salary increase and effective expenditures of the company indicates that further premiums, etc. are being paid on top. For permanent employees 30% overtime payments (the upper limit according to Government regulations) is a standard.

Senior personnel or employees with long working records with the company may take advantage of low cost housing on the Estate.

The earnings of SNAI's permanent staff will be compared with the costs of living in Chapter 2.

The income situation on the casual labour side is even worse: no raise has been given during the last ten years.

The average yearly payment to one casual labourer was SoSh 1 373 in 1969 and SoSh 2 668 in 1982. During the campaign lasting approximately 240 days the average income for casual labour with SNAI amounts to monthly earnings of SoSh 172 in 1969 and SoSh 333 in 1982 per casual worker.

We may assume that the number of 3 900 casuals being employed in 1982 results from the fact that much fewer labourers have received several contracts. This is estimated to be necessary in order to attract a minimum of labour force on the plantation. (Information on casual labour deficiencies is given below, Table Nr VI.1.5).

Casual labour is paid according to so-called 'contracts'. For example, an area of 25 x 50 m, would be one contract for weeding. In the past, cutting the cane and loading was also paid for on the basis of the same area, but is now paid according to weight, approximately 1.0 to 1.2 tonnes being one contract.

The payments for these contracts are low:

Weeding:	SoSh 7/contract
Cutting:	SoSh 8/contract
Loading:	SoSh 10/contract

It is common for one worker to complete two contracts in a day; exceptional workers achieve three or even four.

Casual workers in irrigation are paid by hectares irrigated, at a rate of SoSh 4 for 1 ha. During times of good water availability one man can irrigate up to 2 ha/d. In times when water is scarce he may be able to do as little as 0.12 ha.

Despite the fact that the work is usually far away from any inhabited area neither food nor drinks, or even drinking water are provided for the workers.

Most of the casual work (65 to 70%, according to SNAI/Agricultural Department) is carried out by women and children. Men only participate to some degree in cutting and loading.

If it is assumed that one person receives payment for 2.5 contracts per day as an average, the daily earnings from casual labour with SNAI at present are:

Weeding:	SoSh 17/day
Cutting	SoSh 20/day
Loading:	SoSh 25/day
Irrigation:	SoSh 10/day.

The unattractiveness of casual labour on the SNAI Estate is illustrated by the following table:

TABLE VI.1.5

Casual Labour Deficiencies (1978)
Example of 6 Farms out of 9

Sample of farms Farm Nr	Need	Actually employed	Deficiency
I	150	60	90
II	150	60	90
III	180	80	100
IV	250	160	90
V	400	120	280
VI	400	120	280
Totals:	1 530	600	930

Source: SNAI/Agro. Dept. June 1983.

Deficiency: approximately 60%.

Relating this information to Table Nr VI.1.3 where - for the year of 1978 - it is stated that 2 910 casuals have been employed, receiving a total payment of SoSh 6 494 507, we can conclude that informally the payment per contract of casual labour must have been raised significantly.

Assumed actual payment per day for casual labour:

Weeding	SoSh 25-30
Cutting	SoSh 30-40
Loading	SoSh 35-50
Irrigation	SoSh 20-25

Both the income from permanent employment with SNAI as well as from casual labour must be compared with the present costs of living.

Two basic categories must be considered, urban dwellers without their own farm land and rural dwellers with supplement income from private farming.

1.2.1 Cost of Living in Jowhar

According to interviews (June 1983) held at Jowhar market and with several housewives, the expenditure for one household (7 persons, one month) such as lodging and nutrition (27 items) roughly amounts to SoSh 1 250. (A high variation of these expenses is possible due to different socio-economic standards of different families, but the consultant was assured that unless having one's own farm and living in an Estate house (SoSh 8/month rent for a small unit), a family can hardly live on less than SoSh 800/month, to be spent on food and rent only.)

According to the 'Multipurpose Household Survey' executed for the middle Shabelle region by the Central Statistical Department in 1975 (State Planning Commission, 1977) these types of expenditures represent approximately 70% of all household costs.

The costs of living in Jowhar 1983 are estimated to range between SoSh 1 500 and 2 000 per month for an urban dweller not owning a private farm for the production of basic food items.

The above mentioned expenditures are handled by the housewives. The common statement that they have to give approximately SoSh 50 to their wives every day is roughly confirmed as valid for men working at SNAI/Jowhar at something like a medium income level.

A second wife, which is not exceptional, leads to the foundation of a second household. It is not habitual in the area to have two wives living in one house. In that case a permanent employee of SNAI, living in Jowhar town, would need another SoSh 1 500 to 2 000 per month cash income.

We estimate that a head of a family would desire on top about half of the amount he gives to his wife (or wives) to be at his own disposal in order to cover his personal daily needs.

This however, would not include any funds, for further obligations such as mutual help, family subsidies, small businesses, savings for bad-luck, sickness, etc.

The widely heard opinion, that a man with only one wife, 3 to 4 children, and no private farming going on to add to his income, would need approximately SoSh 4 000 to 4 500/month for a decent living nowadays in Jowhar, is considered basically acceptable.

For permanent employees we have learnt that informal top ups, payments for 'overtime', etc. add up to approximately 70 to 100% of his basic salary; i.e. a man earning some SoSh 750 actually takes approximately SoSh 1 200 to 1 500 home. Still we are obliged to underline that the income from permanent employment with SNAI at present will cover only 30 to 50% of his real needs.

Occasionally urban dwellers have inherited farms in the outskirts of Jowhar, which then may be operated by some of the family members to produce basic nutritional values (for details see below).

We assume that this results roughly in a reduction of cash needs of about SoSh 1 000/month.

The above-mentioned 27 items of everyday needs have undergone an average inflation of approximately 400% during the period from 1976 to June 1983.

1.2.2 Costs of Living in Rural Areas, District of Jowhar

The costs of living in rural areas are extremely hard to assess. If limited to what is needed by a given household in terms of goods to be bought by cash, the socio-economic standard of that particular family will play an important role in determining the level of expenditures.

The size of the family, the size of the farm owned, the size of the herds owned, the possibilities of earning supplementary money to add to returns from farming, etc. make the costs of living (needs for cash income) even more variable than in urban settlements.

The case study of two Somali villages (Lower Shabelle) by Jan M. Haakonsen, published only recently (Haakonsen, 1983) provides the following information, which is assumed to be also applicable for the middle Shabelle region: Haakonson differentiates between three basic categories of households (well-off, medium standard and poor) and separates expenditures for food (sugar, oil, milk, meat and others) and household goods (clothes, soap/detergents, water, kerosene, household items and others). These items determine the average annual cash need, (Haakonsen, 1983).

TABLE VI.1.6

Rural Cost of Living (Lower Shabelle)
(in Somali Shillings)

Type of household	Food	Household	Total
Well-off	6 300	4 800	11 100
Medium	3 300	2 200	5 500
Poor	3 500	1 500	5 500

Source : Haakonsen 1983.

These expenditures do not include funds for occasional extras such as sickness, social obligations, schooling, personal expenditure of the head of the household. We assume that 30 to 50% of the household cash needs will be needed for different other expenditures.

We believe the following figures to be acceptable averages; (including 40% of basic costs for extras).

Total cash needs for rural families: (per annum)

Well-off:	SoSh 15 540
Medium:	SoSh 7 700
Poor:	SoSh 7 700

On a monthly basis this would mean that a better-off household should receive approximately SoSh 1 000 to 1 500 per month, and a medium standard to poor household should have about SoSh 500 to 750 at its disposal.

It is worth noting that according to Haakonsen an average Somali rural family spends at least SoSh 2 000 p.a. for sugar (Haakonsen, 1983) and that the increase of costs of living was about 300% during the last four years.

In contrast to SNAI's permanent employees (entirely or mostly depending on their salaries) casual labourers with a rural background will have several options to provide their families with the necessary cash funds: selling part of their products; working as hired hands for other (richer) farmers; or working for SNAI.

Furthermore, whereas permanent employees are believed to cover only about half of their needs for a decent living with their income from their employment, SNAI's assumed informal payment per contract of casual labour, in principle could cover a poor to medium standard rural family's need for cash income.

The reluctance of the population in the area surrounding the Estate to work as hired hands for SNAI therefore must have other reasons than merely financial ones.

A more general approach to their living and working situation is made below.

1.3 Living and Working Conditions of Permanent Staff; Further Information

In order to approach the social profile of the professional staff in the factory more specifically, interviews with full-time employees were held. Those interviews provided further evidence that, regardless of the level of skill or terms of employment in which a given person actually works for SNAI/Jowhar, the basic needs and costs are far from being met by the actual level of wages. Supplementary income is inevitably needed by every person fully engaged. Working hours run from 7 am to 2 pm; therefore part-time jobs, women being highly involved in adding (not only in money terms) to the family's revenue as well, children being forced to contribute to family funds, grey or black market enterprises must be encouraged. A salaried employee of SNAI without some sort of additional revenues will not be able to survive.

As far as the professional staff of the factory is concerned, a certain number of factors tie the factory's workers to the company.

(a) Professional skills are specialised for sugar production and cannot be applied to other industrial labour. Being trained on-the-job mostly reduces professional mobility, (all workers interviewed, two exceptions).

(b) All skilled labourers interviewed were sons of farmers or nomads (the latter, only one example). Thus the vast majority originates from the area and can be expected to have some sort of family-relation and/or obligations in the rural area around Jowhar.

Approximately 50% of the interviewees admitted to part-time farming. Thus a majority of the factory workers are bound to the region, since they are largely dependent on supplementary income, in that case producing basic food items themselves. (These subsistence farms are largely operated by women.)

(c) Higher qualified professional staff or staff with a long working record with the company often have the benefit of factory housing (30% of persons interviewed). This privilege represents an important saving. Abandoning the job at the factory would result in the loss of free or very low cost housing (at least to some members of the family).

The same point applies to the approximate 25% of the interviewees having inherited houses in town. These people would lose the direct benefit if they moved for the sake of

alternative employment to a place where housing is even more costly than in Jowhar (e.g. Mogadishu).

(d) A large part of the decisions on everyday management of SNAI/Jowhar are not made by the factory management or even the general management staff but on Ministry level or even above. Even a request for dismissal is often not positively responded to. A man who is not willing to work for the factory any more may be forced to stay. This can be expected to have a strong influence on his attitude towards his job and the quality of the work he actually carries out. Among the interviewees there was an extreme example of this case: a well qualified electrician and welder trained, as were most of his colleagues, on-the-job. His skills were highly estimated by the factory management, being only 27 years old his salary was low (SoSh 720/month) and his short period of employment did not allow him to take advantage of further factory privileges (e.g. housing). The man did not have supplementary income from farming. Possibilities for part-time jobs in welding or even industrial electricity are very limited in Jowhar. This man and his family were evidently suffering from severe existential problems. The request to leave the country and earn a living for his family abroad had been denied. The factory management is not in a position to promote the man in order to make him work satisfactorily for the factory as well as for his and his family's survival.

This skilled industrial worker will be dependent on help in food and funds from the relatives, probably poor subsistence farmers or nomads.

The professional commitment and involvement of the employees in the factory is expected to be very low. Presence at the plant rather than actual work seems to justify the very low salary; exhaustion from work on the family farm or other jobs leads to low professional performance on the job.

1.3.1 Further Social Characteristics of Professional Staff

Eight out of ten skilled labourers were born in Jowhar and the surrounding area. A comparable number will have entered SNAI (or SAIS) because their fathers were already among the employees.

Nearly all of them were trained on-the-job. Some of them (approximately 10%) started off with non-industrial jobs: as message boys, working on one of the farms, etc.

School education previous to entering SNAI is generally non-existent.

All labourers interviewed were married. Approximately 30% of them (particularly the elder ones) had two wives. About 4 to 5 children to one wife seems to be average; approximately 60% of the growing children went to school (Jowhar town).

Promiscuity of the men implies further major expenses: women married to the same man do not live in the same house together. Every woman is entitled on marriage to have her own house, furniture and basic housing equipment, which has to be provided together with some cash payment by the man marrying her.

Men married to two wives have to care for two different households to the extent that it is their general duty (a standard of social acceptance and control, which is, as a matter of fact, not very demanding).

Most significant were the responses to questions referring to expenditures: as far as they were detailed according to the items proposed (housing, food, medical care, school, investment and savings, clothing, family care and leisure) the expenditures exceed the basic salary by two to three times. Generally, if answers were not detailed, it was stressed that the salary was insufficient to pay for the costs of living. One person underlined this by stating that his salary would not cover the costs of the cigarettes he smoked (30 x SoSh 25 for one pack of Rothmans/day equals 750 SoSh/month. His basic net salary is SoSh 720/month).

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SNAI Casual Labour Recruitment Programme of 30.3.1983 Including Responsible Household and Population Figures

Nr	Name of Village	Households (Nr)	Population figure	Casuals request
1	Beesha	na	na	60
2	Bayaxaw	na	na	60
3	Nuukaay	na	na	100
4	Bacaadley	47	252	30
5	Jilaalle	40	253	20
6	Sabuun	70	442	100
7	Megedley	30	201	20
8	Maryaale	11	82	20
9	Buulo Waraay	60	600	100
10	Timire	na	na	60
11	C/Galadey	84	154	150
12	Shamento	162	612	200
13	C/Alwaan	na	na	25
14	Jilyaale	na	na	50
15	Qajafey	134 (298)	465(1 093)	50*
16	Buulo Nave	106	368	110
17	Buulo Fermo	189	823	200
18	Kaxarey	30	145	10
19	Raqayle	137	692	110
20	M/dhere	213	1 101	100
21	D/same	551	1 420	50
22	G/shanle	na	na	10
23	Boodaale	75	387	20
24	Gum/Marerey	na	na	70
25	Gaafay	20	172	20
26	L/waab	40	256	60
27	Buulo Bishaaro	10	56	10
28	Iga Dadab	na	na	50
29	G/berkaan	82	528	150
30	Jameeco	200	818	100
31	M/cad	na	na	50
32	A/Beenaad	na	na	30
33	Towfiiq	22	109	25
34	D/dheere	51	301	50
35	Gumarey	40	153	40
36	Bad-Bad	na	na	40
37	Beesha Mahaday	na	na	300
Sample	of 65%	2 568	11 020	-
TOTALS		3 800	16 500	2 650

Notes : * For the village Nr 15 (Qajafey) the SNAI programme includes the neighbouring settlements, Madina Cad (66 households, 208 population) and Don Shuule (98 households, 422 population). Therefore, for the respective population, and household figure these have to be added to the Qajafey figures.
Na Not available

Source : City Council of Jowhar and SNAI Agricultural Department.

CHAPTER 2

CASUAL RURAL LABOUR

2.1 Population Figures

Starting with last year's small campaign (October 1982) the system of recruitment of casual labour has been changed. Being de-centralised until that time (for details see Chapter 4.2.2) it was then taken in hand by the central Production and Transport Unit of SNAI/Jowhar, which is now entirely in charge of running the harvest side of the campaign in all aspects. (This centralised method of labour recruitment and campaign management seems to have caused a series of problems and is expected to be changed back into the old system soon.)

Concerning the recruitment of casual labour the Agricultural Department of SNAI has established a program (of 30.3.1983) fixing the number of casual labourers to be sent to the Estate in campaign times by 37 villages of the area and 4 urban districts of Jowhar itself. The relative importance of urban versus rural recruitment according to that programme is equivalent to 20 (urban) to 80 (rural). In reality, though, casual labour seems to come from the town only exceptionally. The urban population is physically as well as emotionally even less prepared to work on SNAI's cane fields than the poor farmers of the area. Therefore the following comments on high casual labour deficiencies can be restricted to the rural population of the area.

This area - with which this part of the study deals in some detail - has been defined by the distribution of the villages according to the said programme of 30th March, 1983.

The figures on a sample of villages concerning the number of households and the population have been provided by the city council of Jowhar.

Unfortunately the household and population figures were obtained only at the very last moment before leaving Jowhar. So it was impossible to discuss details and incongruities. The missing correlation between population density and recruitment program requirements is evident: only in 11 cases of all villages on which both household plus population and programme figures are available, a presumed rate of one person per household recruited is deviated at less than 33.3%.

Recruiting 50 persons out of a village with 1 420 inhabitants but 100 out of 1 101 or even 110 out of 692 is not self-evident.

Since the sample of villages from which information on the number of households and population were obtained represents 65% of all villages in the SNAI-programme, the rural area from which casual labour is requested to work on the Estate is assumed to have a total population of 16 500 inhabitants distributed over approximately 3 800 households.

The per household recruitment quota is then 0.7 persons and the percentage of the total population recruited is 16%.

For the location of the different villages and the size of the recruitment area (approximately 100 km^2) see Figures VI.1 and VI.2.

The vast majority of the population in the so-defined region is concentrated in villages on the banks of the Shabelle river. Only 8 out of 37 villages in the programme, lie outside the flood irrigation area of the valley, mostly on the lower slopes of the east side hills (villages Nr 13 to 15, 30 to 33 and 36).

With its size of roughly 100 km^2 the region covered by the SNAI casual labour programme is about ten times the size of the Estate itself (10 000 ha). Excluding Jowhar as an urban agglomeration, the density of the rural population is 15 to 18 persons to 1 km^2 which is very low compared to similar soils and types of agricultures in other countries, where the square kilometer density of the rural population may extend into several hundreds and in peak areas (Central Java, plains of Haiti) approach 1 000 persons/km^2.

Distributing the soil per household on the basis of the figures which have been made available (3 600 households to 100 000 ha) we obtain an average of 27.7 ha per household, each at 4.34 members in average. The 1979 to 1981 three year development programme (World Bank, 1981, Volume 2 page 234) states 263 000 inhabitants for the entire region of Middle Shabelle with a total of 22 000 km^2. The average population density for this area is 11.96 persons/km^2. Expecting the population to concentrate in fertile soils of the valley rather than in the hills, 15 to 18 persons/km^2 for the SNAI casual labour programme area is plausible if not substantiated.

2.2 Working Conditions of Casual Labour

The management of all production aspects of the Estate works via three sections, each of which unites three farms under its supervision.

The recruitment, of casual labour has recently been centralised and been put into the hands of the Production and Transport Unit.

Until October 1982 the recruitment of casual labour was organised by the different farms themselves which addressed the villages of the surrounding area directly, more precisely the respective village (buulo) council (the institution of political and administrational leadership on the village level). The villages - within the range of convenient walking or driving distance - were quasi 'allocated' to the different farms, vicinity being the most important criterion.

These relationships between farms and villages were often facilitated by the fact that close relatives or family members of the village representatives in the buulo councils were permanently engaged labourers on farm level. The procedure was that a well known person was sent from a given farm to a given number of villages(s) informing the buulo council(s) several days ahead of the amount of labour needed and requesting the council members to point out the workers (men and women) who were to be sent to the Estate.

On the day planned an Estate-truck or so would pass and collect all labourers.

Some villages lay directly on the Estate itself.

On the farm the job is organised in so-called 'contracts', each defining a certain duty according to which the payments are made. The persons engaged are reported to the Personal Department of SNAI in the headquarters and from there a representative is sent out to the fields and to execute the payments.

Looking at the different tasks more closely :

(a) Weeding

One contract equals one plot of 25 x 50 m. Several persons, usually between 2 to 6 (and in this case mostly women and children) may be allocated by a farm employee to one plot, according to the density of weeds, etc. If several persons work on one plot, every person gets a full contract payment. One person can participate in two maybe even three plots being cleared in one day. Formally the payment per contract of weeding is SoSh 7 so that one person could earn between 15 to 20 SoSh in one day of weeding (officially).

(b) Cutting and Loading

Formally the same procedure was applicable to cutting and loading as well (plots of 25 x 50 m, 2 to 6 persons being allocated to one plot according to the quality and density of the cane). The low availability of casual labour in recent years and the corresponding reluctance to work effectively for low payment forced the Estate management to change from this 'area-covered' contract form (SoSh 8 for one contract of cutting, SoSh 10 for loading) into weight performance : 10 to 12 quintals (i.e. 1.0 to 1.2 metric tons), with the weight roughly estimated by the team leaders, now being the basis of one contract payment. 'A good man' - according to the SNAI/Jowhar Agricultural Department should be able to cut or load 3 to 4 contracts in one day. Officially a cutter or loader (in the case of extreme high activity) can earn somewhere between SoSh 25 and 40 a day. But it is generally agreed that a man loading or cutting 3 to 4 tons in one day will firstly only do this if informally his payments are significantly higher than officially intended and secondly will not come back to his job the next day but will need a full day of rest.

(c) Irrigation

A given field is allocated to one particular man, preferably experienced in working a smaller number of fields regularly. Opening and closing the feeders, distributing the water over the fields in his charge (using a hoe or other simple means) and supervising the proper irrigation would be his duty, paid at SoSh 7 for one hectare. If water availabilities are good, one man can irrigate 1.5 to 2.0 ha in one day. In dry seasons with low water availabilities one man may only be able to take care of as little as 0.1 to 0.2 ha/day. This job will earn officially somewhere between SoSh 10 and 15 a day. Evidently it is quite unrealistic to expect any man to be ready to work efficiently for such a payment.

The jobs are usually far away from any inhabited area and neither food nor drinks, nor even drinking water, are provided. This, on top of extremely low payments, has to be provided by the labourers themselves which contributes to reduce the attractiveness of SNAI jobs even more.

Apart from this the question remains of whether cane-cutting or irrigation on a modern plantation can be called 'unskilled work' in the true sense of the word and if women and children (two thirds to three fourths of the labour force) are the human resources prepared to execute them.

2.3 Actual State of Surrounding Agriculture

This section is a very rough description of the farming in the area surrounding the SNAI sugar Estate, and aims at a determination of the households' income from traditional agriculture. This permits one to conclude to what extent the rural population is dependent on futher cash income (besides their farming) or, in other words, whether the jobs offered by SNAI meet an actual demand for rural employment.

The area surrounding SNAI/Jowhar sugar Estate can be divided into two basic types :

- Flood irrigation area in the lower parts of the valley, usually connected with some traditional irrigation systems or mixed irrigation systems, water being partly provided by SNAI through feeder channels.

- Rainfall agriculture outside the lower parts of the valley whose fields cannot be reached by water distribution on gravity basis.

The two different types imply specification in :

- crops grown, return expectation and risks connected with production;

- type of cattle breeding, its importance as a second source of income;

- socio-ethnic, historical background;

- exposure to occasional droughts.

In order to obtain information on the different points of importance for this study a series of interviews was held with members of buulo councils in villages of both types of agricultural area.

For the flood irrigation area representatives of the following villages were interviewed: (in brackets the numbers of the village according to the list in Table VI.1.7 Sabuun (V. Nr 6), L/Waab (V. Nr 26), Buulo Bishaaro (V. Nr 9).

For the rainfall agricultural area : Jameeco (V. Nr 30), Mubaarak.

For the villages on the Estate : Buulo Shameento (V. Nr 12); Buulo Nave (V. Nr 16).

From the distribution of the two types of agriculture see Figure V1.2.

2.3.1 Brief Description of Flood Irrigation Area

As can be seen in Figure IV.2 a valley type of village will mostly be located on the bank of the Shabelle river. The higher level of the bank will have offered some security from floods in the days when the older villages were founded.

The river flooding the fertile soils of the valley bottom more less regularly will have attracted populations accustomed to farming in early days. Lower and Middle Juba and Shabelle region (riversides) had settled farms of Bantu origin long before Somali tribes took control over the area, (Lewis, 1980, p 7).

As can be learned from Appendix IV Section 2 (age of villages in the area), most of the villages on the riverbanks already existed in 1900, whereas most of the villages originating from the time after 1945 lie in the rainfall agriculture area.

The irrigation of the fields was eventually improved by building simple forms of channels. With communal efforts of all farmers of a given place, up to two or three feeders have been dug for all fields of one village. A secondary or tertiary system was usually not developed but most of the water distribution was and is done directly out of the primary. Although there was no technique developed to manage water levels in the river itself by building dams, the distribution of the water over the fields was based on some knowledge of needs and availabilities.

After the necessary authority is put into the hands of a few elected members (of the respective village), the watering of the fields is managed in a 24 hour rota. The absence of dams to manage the water level in the river does not allow the use of the term 'developed' method of irrigation. This is the reason why generally the term 'flood-irrigation' is applied throughout this report.

The system developed can be considered 'improved flooding' since water availability in the simple feeders was still fully dependent on the water level in the river itself. As soon as that dropped below the mouth of the feeder, water supply for the fields would end.

These types of traditional plantations still were and are highly dependent on a water supply supplemented by rainfall.

The normal size of farms in the areas visited would be about 3 to 4 ha; a family actually operating 4 ha is already considered rather wealthy. Two ha cultivated would be the size of the farm belonging to a poorer family. Those operating with traditional techniques will rarely cultivate more than 7 ha; they are considered to be rich. The heads of well-to-do, old settled families may own far larger plots (30, 60, in one case even 200 ha). It is either not regarded opportune to actually cultivate more than 6 to 7 ha or quite simply not feasible regarding the technical and manpower means available.

We have stated above that the average soil availability per household in the SNAI casual labour recruitment area is 27.7 ha/household. From this we may conclude that the unused potentials in soil are rather important, if an average area under cultivation per houshold figures somewhere between 3 to 5 ha.

According to Haakonsen (1983), in flood irrigated agricultural areas of Somalia (FAO/IBRD estimates) the labour force demand for weeding (the activity demanding the highest work input) counts for 4 days per hectare, or 12 days per hectare per growing season (one man). The size of a given family, the number of members able to carry out physical work, will have a high influence on the amount of land that one family actually can cultivate (ibid, p 26).

Haakonsen indicates, furthermore, that we can expect about half of the total population to operate their farms under economically less favourable conditions because they are descendants of former slaves. These families will have limited titles on land (ibid., p 71).

Land ownership can be irregular to some extent. The fields actually under cultivation are frequently rotated (if exhausting the soil). But since, traditionally, one single cultivation of a given plot constitutes the right of soil ownership, old families with many members who have settled in a given area a long time ago, will have ownership over large areas being reserved for exploitation only by themselves, (Haakonsen 1983, p 29f). Soil is still sold or rented, regardless of this being forbidden by the law Nr 73 of 1975 (all land being State property; exploitation should become possible only on basis of concessions and leases which in turn could be transferred through inheritance).

The prices for 1 ha vary from SoSh 1 000 (dry land) to SoSh 6 000 for land lying near the river. Rent is usually not paid in cash but in maize or sorghum which is used to feed livestock during the dry season, (Haakonsen, 1983, p 30f).

Haakonsen, quoting the World Bank (1981), says that the average size of property per household is 3 ha in the flood irrigation area (p 29) and about 5 ha for dry land farms, where again, according to FAO/IBRD, the maximum of what can adequately be cultivated was estimated to be 0.8 ha per household member (ibid., p 26).

Cultivation is organised according to the two seasons (gu = March to June, der (deyr) = September to December). The crops grown and their relative importance are quite uniform in the flood irrigated area visited:

gu — Maize is grown on the largest parts of the fields cultivated, planted in small heaps of 2 to 3 plants isolated, (not in rows), intermixed with beans of local species.

Smaller amounts of sesame are planted as supplement crops, mostly for private consumption.

der — Approximately two thirds of the area under cultivation will be taken by sesame, approximately one third then occupied by maize and beans planted the same way as in the gu season.

Cattle breeding is almost completely absent in the villages in the valley. There are chickens, about 10 to 20 to one family. Sheep and goats are rare. The absence of cattle is said to be due to the presence of tse-tse flies. However, large herds of cattle can be seen moving through the valley and few tse-tse flies were observed by the Consultant. Different traditions in that respect may also influence a different economic behaviour. Small plots of banana plantations can be seen occasionally, but, just like other fruit trees, they do not have significant importance for the farm output. For productivity and the income expectation see the following chapter.

2.3.2 Brief Description of the Rainfall Agriculture Area

In the villages visited outside the valley, the importance of planting is, due to irregular and insufficient rainfall, clearly lower than in the valley. The sizes of the farms (in contrast to FAO/IBRD estimates) are smaller than the farms in the flood irrigation area: an area of 3 ha under cultivation would be considered to be a 'good' size, 1 ha would be regarded as small.

The production cycle is :

gu — Maize and beans in approximate proportions of 2 : 1 (mixed cropping), usually sesame is not grown in the gu season.

der — In the der season some farmers seem to leave out the growing of maize, planting sesame and beans in the ratio of 2 to 1, others maintain maize and beans just as in the gu season, only adding some sesame for private consumption.

The emphasis of a farmer's property and activity is on cattle breeding in rainfall agricultural areas round Jowhar. Approximately 30 head of cattle (of which approximately 20 are females and 10 males) is considered a normal to good herd for one family. Sheep and goats are of no major importance for breeding in the area visited. Camels are not raised. Fifteen to twenty chickens to one household seems to be normal.

The irregularities in rainfall may affect the population of that area severely: it will cause very low to zero harvest in crop production; reduced grassland availability for the herds, and thus diminish productivity of the cows in milk as well as in calves; cause malnutrition; favour sickness of the animals; and may lead to significant reduction of the sizes of the herds. Such years will cause severe cuts in the revenues of rural families of those areas and force them to search for supplementary income.

2.3.3 Assessment of Income Situation per Household in the Flood Irrigation Area

The assumptions made below refer to a hypothetical type of average farm : 3 ha of irrigated land under cultivation, 2 households, 10 persons, no animals except 10 chickens. The productivity expectation for the different crops is evaluated from the Consultants' interviews (June 1983).

Productivity expectation :

gu — good : maize 20 quintals/ha, beans 3 quintals/ha (mixed cropped)

gu — low : maize 10 quintals/ha, beans 1 quintal/ha (mixed cropped)

(yields for maize means maize in cobs, not net grain harvest)

assumed long term average (total 3 ha)	45	quintals maize
	6	quintals beans

der — good : sesame 5 to 6 quintals/ha, maize and beans as in gu

der — low : sesame 2 quintal/ha, maize and beans as in gu

assumed long term average (total 3 ha, 2 ha sesame, 1 ha maize and beans mixed cropped)	14	quintals sesame
	15	quintals maize
	2	quintals beans

total yearly long term average productivity expectation :	60	quintals maize (cobs)
	8	quintals beans
	14	quintals sesame
private consumption (seeds included) for two households :	16	quintals maize
	4	quintals beans
	4	quintals sesame
production available for sales : (yearly long term average)	approx. 44	quintals maize
	approx. 4	quintals beans
	approx. 10	quintals sesame
	800	eggs*

Note : * The yearly return expectation from sales is: with 10 chickens sales of 7 to 9 eggs every third day, the rest are for private consumption.

TABLE VI.2.1

Prices for Agricultural Products, Sales Jowhar Market, June 1983 (Somali Shillings per quintal)

Product	High price	Low price	Assumed yearly average price
Maize	1 000 - 1 200	350	700
Beans	1 000 - 1 200	400	750
Sesame	1 500	650	900

Source : Consultants' interviews.

Haakonsen quotes the following figures for the said products for 1982 : maize SoSh 420/quintal, beans SoSh 700/quintal, sesame SoSh 1 100/quintal. This counts for rural wholesale. We may expect differences in prices between rural wholesale and an urban market at Jowhar, (Haakonsen, 1983, p 52). The price for one egg was SoSh 1 in 1983.

For the assumed type of average flood irrigated farm this leads us to an average annual gross income expectation (at sales 10% below the best yearly average price):

44	quintals maize (cobs at SoSh 5.6 kg)	SoSh	24 640
4	quintals beans	SoSh	2 700
10	quintals sesame	SoSh	8 100
800	eggs	SoSh	800

Thus the assumed average type of flood irrigation area farm would have an average yearly gross income of SoSh 35 440 or, monthly, of roughly SoSh 3 000.

According to the statements made above, concerning costs of living in rural areas, a medium standard family has a monthly need for cash of SoSh 500 to 750. At costs per month of SoSh 750 the head of the family would be left with approximately SoSh 17 500 at his disposal, (per annum).

This very approximate assessment of gross returns of farming in flood irrigated areas (near Jowhar) shows clearly, although based on a medium type of farm but on a twin household situation, that such a farmer at present seems to be far better off than a permanent employee of lower to medium level at the SNAI plantation in Jowhar. If we hypothetically reduce the gross returns for a poor family to half what it is in the above presented example (still under condition of a twin household, with soil property of 1.5 ha permanently under cultivation) a poorer family would be left - in a long term average, with a gross income about twice as high as its regular cash needs (SoSh 750/month cash needs, SoSh 1 500/month cash income from selling agricultural products).

Haakonsen assesses (for the various households in the two villages observed) an annual income surplus of approximately SoSh 20 000 for better-off families of approximately SoSh 5 000 for medium standard and of SoSh 1 000 for poor families (Haakonsen, 1983, p 65).

2.3.4 Assessment of Income Situation per Household in the Rainfall Agricultural Area

For the following assessment it is assumed that the yields in crops are 20% below those of flood irrigated areas. The approximation applies to a hypothetical type of average farm: 2 ha under cultivation, 2 households, 10 persons, 20 cattle (12 females and 8 males) plus 15 chickens.

Productivity expectation :

gu	good : maize 16 quintals/ha beans 2.5 quintals/ha (mixed cropped)		
	low : maize 8 quintals/ha beans 0.8 quintals/ha (mixed cropped)		
	assumed long term average (total 2 ha)	25 3.5	quintals maize quintals beans
der	good : sesame 4.5 quintals/ha beans 2.5 quintals/ha		
	low : sesame 1.5 quintals/ha beans 0.8 quintals/ha		
	assumed long term average (total 2 ha)	4.0 1.0	quintals sesame quintals beans

2.3.5 Cattle Breeding

Generally amongst Somali cattle breeders the animal itself is no object of commerce. The herd is considered under criteria such as savings, social position of its owner, or reserved for special occasions such as sicknesses, births, marriages, etc.

Slaughtering of animals is rare, although eventually oxen may be consumed or sold. Selling an animal is seen by society as an expression of calamities met by the seller and avoided in order not to lose face.

Interviews held on Jowhar cattle market on 15th June 1983 showed that no comparable inflation rate, as observed on other items of every day use, affected cattle trade.

Also the demand resulting from cattle exportation (to Saudi-Arabia mostly) does not seem to influence Jowhar market prices significantly.

An example was mentioned to the Consultant : a 40 year old family head, owning 25 to 30 cows, 15 to 20 sheep and goats will, with the exception of meeting particular good or bad luck, about double the size of his herd by the age of 60. He will not try to limit his herd to a certain reduced number of heads, e.g. because of concern about availability of grassland reserves or water supply. For these reasons the following approach of return expectations from cattle breeding does not consider any income from sales of animals but is restricted to the selling of milk. Still, the value of the herd introduced as an example (20 heads, 15 females) counts for some SoSh 100 000 to 125 000, since cows, in 1983 at Jowhar market, were sold, according to quality, between SoSh 3 000 and 7 500.

The price of one litre of milk is SoSh 7.50 (1983).

12 cows, milked twice a day (morning and evening) with stated production of 2 x 3 l/d

assumed annual production :		1 250	l/cow
total		15 000	l
15 chickens producing approximately		1 500	eggs/year
total yearly long term average productivity expectation :		25	quintals maize
		4.5	quintals beans
		4.0	quintals sesame
		15 000	l milk
		1 500	eggs
Private consumption (seeds included) for two households :		16	quintals maize
		4	quintals beans
		4	quintals sesame
	approx.	720	l milk
	approx.	1 000	eggs
Production available for sales : (yearly long term average)		10	quintals maize
			beans
			sesame
	approx.	14 000	l milk
	approx.	1 000	eggs

Assuming here, as above for the example from the flood irrigated agricultural area, that the products are sold at 20% under the best annual average price per item, due to less favourable access to markets, this leads us to an average annual gross income expectation :

10 quintals of maize	SoSh	5 400
1 000 eggs	SoSh	1 000
14 000 l milk	SoSh	105 000

Thus the assumed average type of rainfall agricultural area farm would have an average yearly gross income of approximately SoSh 100 000 or, monthly, roughly SoSh 8 300.

This would only be true for a year without drought or water shortage. Since every second year, in long term observations, water is scarce and every fourth year the area undergoes extreme water shortage or droughts, dry land farmers are subjected to extreme variations in terms of cash income which is directly connected with the productivity in milk.

Even if the information on milk production and the Consultants own (reduced) estimations represented an exaggeration of 100%, in a year with normal rainfall the family's total cash income would amount to some SoSh 50 000. With an SoSh 750 to 800 monthly cash need (approximately SoSh 9 000 to 10 000 per annum) the family head would be left with approximately SoSh 40 000 at his disposal. The conclusion to be drawn from this is that as long as no drought or water shortage occurs, drying out grasslands and reducing or completely bringing the milk production to a stop, the cattle breeding farmer and his family will have no problems in surviving. The above assessment shows good reasons why cattle raising is still the most favoured form of rural enterprise in Somalia.

Furthermore, milk is a basic, highly estimated item of nutrition in Somalia. Prices are comparatively high and no seasonal variations are observed. The selling price in the above calculations is based on SoSh 7.50 per litre, urban market prices being SoSh 10 per litre. This is significantly higher than Central European end consumer costs (approximately SoSh 7 per litre).

In years, though, when there is very little or no rain, not only the milk production, but also crop yields will be reduced or approach zero. Then the farmers in rainfall agricultural areas will face situations of little or no income. They will be obliged to search for alternative income.

Unfortunately this study cannot provide any particular information concerning the poorer population in rainfall agricultural villages.

Theoretically, if owning only little land (1 to 2 ha) but particularly no or only few cattle, this group would be the most underprivileged among all of the rural population in the area and thus be the most dependent on supplement income.

A more detailed sociological survey on rainfall agricultural villages in the area of Jowhar is needed in order to quantify the population with limited land property (less than 2 ha) and little to no cattle.

The case study of Haakonsen (1983) provides the following indicative information, comparing one village in a flood irrigated area (Beled Aamin) with a village with dry land farming (Lama Doonka) :

TABLE VI.2.2

Household Properties in %, Land and Cattle
One Village in Flood Irrigated Area versus One Village in Rainfall Agricultural Area of Lower Shabelle

Property	Lama Doonka (N = 35)		Beled Aamin (N = 51)	
	with	without	with	without
Land	100.0	0.0	90.2	9.8
Cattle	81.3	18.7	25.5	74.5
Donkeys	68.6	31.4	0.5	99.5

The example of Lama Doonka :

There are no households without land in that particular dry land farming village, but roughly 20% of the families own no cattle at all.

We may expect another group of significant importance that will own only a few cattle, eg. less than 5 head.

As a working hypothesis we assume that about one third to one half of the population in rainfall agricultural villages has an income below that which has been assessed on the previous pages.

These families will be affected even more severely by water shortages and droughts.

2.4 Rural Employment

In order to assess the quantity of labour force of the area which could be constantly available for SNAI/Jowhar to meet the company's needs for running the campaigns, it is necessary to show that part of the regional population is either :

- unable to meet their costs of living by their habitual sources of income, i.e. in this case the two types of farming observed;
- or their is a significant portion of the population unemployed throughout the year, or at least during the times when the cane harvest are on schedule. For the farming region of Jowhar this would necessitate proof that there is a landless, rural proletariat.

The latter possibility can be excluded. In the villages visited during the Consultant's field stay no landless population of significant importance was found. (Haakonsen, see Table Nr VI.2.2, previous page found approximately 10% were landless families in Beled Aamin.)

Furthermore, there is no development towards huge estates or at least none of such importance which could lead to the expulsion of small farmers from their habitual residences.

Therefore the consideration in this chapter can be reduced to an assessment of organisational costs of small to medium size farms as being roughly opposed to long-term income expectations as roughly elaborated in the previous chapter.

The costs of operating a farm , as cash need, only appear in cases when the family property is big enough to produce more than actually needed for private consumption. Farmers with land, the output of which just equals the needs for private consumption, (or is less than needed), will be obliged to organise their production with what is available in terms of labour force within the family.

In the villages visited all families of medium standards (3 to 4 ha under cultivation) or better-off farmers tried to hire manpower in order to have the heavy work done by others.

In these cases the family members will participate only, if possible, in weeding and harvesting. They will try to avoid participating in the hardest jobs which are the clearing of the fields and the soil preparation for seeding.

If casual labour is engaged for these jobs they are organised, just as on the SNAI plantation, in so-called contracts, of which two basic types are known :

- Plots of 25 x 25 m, usually prepared in a period of 4 to 5 hours, paid up to SoSh 60 for each contract and with food and drinks provided by the employing farmer. Two contracts a day would be the normal work achieved.

- Half-a-day contracts, no fixed volume of work to be done in that time (a minimum of efficiency is socially agreed), however paid at SoSh 30 and with food and drinks still provided by the employing farmer. Two contracts a day are the normal working performance.

However, it is not only casual labour that is engaged in the hardest jobs in farming nowadays; mechanical ploughing plays an important role in the area of Jowhar. Of the farmers having 3 or more hectares under cultivation 60 to 80%, according to the interviews held in June 1983, used hired ploughs, a development that commenced as early as the 1960s (using a tractor and harrow) and in the 1970s became a more general habit (they now use a tractor with disc plough). The answer to the question 'Why is this done?' was : 'The labour to do the soil preparation is not available any more'.

Presumably it was the vicinity of both the highly mechanised SNAI Estate and the urban centre of Jowhar that promoted the introduction of mechanical means of production into traditional agriculture.

Tractors and ploughs can be rented from co-operatives, from governmental rural development institutions and from individuals who own said equipment privately. Tractors are not privately owned by farmers in the area visited.

The comparison between prices or payment for casual labour and tractors and the price increases during the last 20 years is rather illustrative :

TABLE VI.2.3

Prices and Payments for Casual Labour and Tractor and Plough Rent and Increases (1960 to 1983) in SoSh

Year	Casual labour		Tractor and plough
	SNAI*	Farmer*	
1960	na	na	15
1970	4	1.5 - 2.5	25
1983	7 - 10	30 - 60	85 - 125

Notes : * In all cases the employment with SNAI excludes food and drinks, whereas when employed with a private farmer food and drinks are included.

na Not available

Source : Consultants' interview.

The respective rates of increases from 1970 until 1983 :

	1970	1983
SNAI casual labour payment	100%	200%
Private farmer casual labour payment	100%	3 000%
Tractor rental cost per hour	100%	400%

It should be repeated here that costs of living in Jowhar have gone up some 400% during the last seven years and that Haakonsen found some 300% for the last four years in the rural area investigated.

Taking this information as a basis, the assessment of layour force demand from private rural employers is based on the following assumptions:

- the part of the total population in SNAI's casual recruitment area which is entirely landless does not exceed 7.5%;
- the percentage of households that have regularly 3 ha or more under cultivation is about 50%;
- the rest are small farmers organising their farms with the labour force available in the family;
- the part that well-off farmers play within the total population of the said area (7 and more ha under cultivation) does not exceed 10%.

The SNAI casual labour recruitment area roughly has a surface of 100 000 ha, 3 800 rural households with a total population (rural only) of 16 500 persons.

Here are the above made assumptions in figures :

7.5% of households not owning land, cultivating	0.0	ha
42.5% of households cultivating x 2 ha, total	3 230	ha
40.0% of households cultivating x 4 ha, total	6 080	ha
10.0% of households cultivating x 8 ha, total	3 040	ha
Total area under cultivation	12 350	ha
Average area under cultivation per farm	3.5	ha

The assumption that about half of all farmers in the said area tend to employ their casual labour for the hard work on the fields or to hire ploughs and tractors refers to approximately 1 760 households and a total surface of 9 120 ha.

Approximately 75% of that area will be ploughed mechanically, i.e. an area of approximately 6 850 ha. According to the farmers interviewed a tractor ploughs about 1 ha in one hour. Haakonsen assumes one and a half 'darab' (approximately 2 darab to 1 ha) per hour (Haakonsen, 1983, page 36). To an average rent of SoSh 100 per hour (1983) the farmers allow for approximately SoSh 200 tip for the driver (otherwise he will not come). Those better-off farmers that have sufficient funds to hire the tractors (and access) will have to spend between SoSh 125 and 150 per ha under cultivation for ploughing. For both seasons this amounts to SoSh 250 to 300 per ha.

The costs for casual labour doing the same job are significantly higher so that those farmers that have secured possibilities of renting the said equipment can make important savings. One man prepares two times 25 x 25 m in one day, thus the preparation of 1 ha consumes about 16 contracts, one of which is assumed to cost SoSh 50 in 1983 (the costs for food and drinks are neglected). The costs of soil preparation per ha, if done manually count for approximately SoSh 800. For both seasons this runs up to SoSh 1 600. The area assumed to be prepared manually measures roughly 2 270 ha.

This then represents a demand for 36 320 contracts per season or roughly 18 000 man-days.

We assume that about 25 to 30% of all households have a constant need for supplementary income, thus their readiness to work as hired hands.

For about half of all households in SNAI's casual labour recruitment area (1 900) which have an average of 4.34 members we believe the regular average availability as a casual work force does not exceed 1 person per household.

Presumably two to three weeks being the time available during which the soil-preparation has to be executed, the work force potential of SNAI's casual labour recruitment area roughly represents between 26 600 and 40 000 man-days.

From this it is concluded that out of a work force potential of 1 900 persons in the said area, roughly half find employment with private farmers in the area (per season).

Haakonsen's (1983, page 37) and the Consultants' own interviews in the area demonstrate that weeding and harvesting are usually jobs done by family members. Unless the family is extremely well-off no casual labour will be employed for these duties.

For the assessment of net returns in the two hypothetical types of average farms as made above, the costs for soil preparation as the main expenditure result in the following :

TABLE VI.2.4

Net Returns of Two Basic Types of Farms in the Two Agricultural Areas Considered

	Flood irrigated		Rainfall agricultural	
	A	B	A	B
Annual gross income	35 500	35 000	40 000	40 000
Expenditures basic living	9 000	9 000	9 000	9 000
Soil preparation	1 000	5 500	500	2 750
Miscellaneous	1 000	1 000	1 000	1 000
NET RETURN	24 500	20 000	29 500	27 250

Notes : A = mechanical ploughing
B = under use of casual labour (SoSh per annum)

This assessment, which is presented only to indicate some basic tendencies and is not intended to provide any analytical proof, seems to permit the conclusion that traditional farming at present in the area of Jowhar can support a family without difficulties. Unless the farm is very small (2 ha, and less in flood irrigation areas, 2 ha and less and no or few cattle in dry land farming), is poorly managed or the family is too big if compared with the size of the farm, the rural population has no survival problems. As far as rainfall agricultural farms are concerned it has been mentioned that their income is, although significantly higher in good years than that of their valley counterparts, less secure. It will vary according to rainfall, water availability and grassland condition and is extremely sensitive (being affected by droughts, reduced milk production, sickness of cattle).

The above assessment of rural demand for rural casual labour indicates that costs for soil preparation will not affect the overall return situation of small and medium farms too severely (25 to 50% input of gross returns).

On the other hand, in order to obtain precise information concerning the availability of the work force, a survey providing quantified results on the following aspects is needed :

(i) From the information obtained that 60 to 85% of all better-off farmers use tractors and ploughs for soil preparation, in the above made approach it was concluded that 75% of all soil preparation was actually done mechanically. To what extent the farmers really have the possibility to rent this equipment and thus what portion of the area cultivated is really ploughed by tractors demands detailed surveys.

If the availailability of tractors is limited and, as a consequence, the surface ploughed mechanically is only half of that assumed above, the rural demand for the work force is raised to twice the amount of what was calculated above. In other words, the casual labour availability would turn out to be insufficient to satisfy even the rural demand (not taking into account SNAI's demand). At the same time the costs for soil preparation would go up significantly, since mechanical ploughing seems to be only half as costly as the same service done manually.

(ii) The numerical role of the poor - preliminarily defined as those whose farms are too small to support the family and to provide sufficient cash income and those who have no land at all must be identified; both in terms of their total population as well as their actual willingness to provide their work force. (The questions 'To whom? under what condition? when?') must be asked.

This is the determining factor concerning SNAI's recruitment problems: if that population is too small (or it may have decreased during the last years), if the availability of mechanical equipment to replace it in private farming is too little, and the income situation of medium to well off farmers is good (e.g. due to high prices of the products they sell) the competition between SNAI and private farmers to employ the work force needed will be very strong indeed.

(iii) Some of the poorer families may have traditional links with better-off families. Obtaining help occasionally (credit, contacts with authorities, etc.) may oblige them to provide their work force - although well paid when requested. This may happen without regard to whether this particular family has any need for cash income (at that moment) or not. Families with such ties will not appear on the 'free casual labour market' of the area.

2.5 Competitive Employment

Some of the SNAI staff members have indicated that a large number of competitive employers in the nearby area have reduced SNAI's capacity to recruit the casual labour which is needed to run the sugar campaigns properly. This means industrial plants as well as large scale rural projects, both paying far better than SNAI. This hypothetical explanation for scarcity of casual labour in the region has not been confirmed by the facts collected by the Consultant.

The main competitor to SNAI, said to be SOMATEX (Somali Textile Company in Balcad), employs 1 600 persons, but is over staffed due to under use of capacities. Shop workers earn SoSh 800/month, including incentives. SOMATEX does, in contrast to SNAI, provide free meals and drinks and, like SNAI, some low cost or free housing.

SOMATEX, employing some 400 women and 1 200 employees who are small farmers and nomads, still has reasons to complain about unauthorised absenteeism, (according to an unpublished report on industrial development projects seminar, held in Mogadishu, August 1982.)

Women are allowed 4 months pre-natal pregnancy leave and 1 year post natal leave. Female absenteeism is said to be particularly high.

Other possible competitive employers (rice farm, north of Jowhar, cattle raising project, south of Jowhar, not yet operational) have no significant importance. The promotion of rural, small farmers' co-operatives is, in the Consultants opinion, not a reason for the reduced availability of rural casual labour, but a justified reaction (on a political level) to the preferences of small farmers to live on and from their farm lands, rather than from the return when working as hired hands.

CHAPTER 3

WAGE LABOUR FOR SNAI AND THE SCARCITY OF MANPOWER

SNAI cannot be put on the same footing as a traditional agricultural employer of the region. There are various reasons for this.

The SNAI Sugar Estate and sugar factory is a former colonial enterprise recently nationalised by the Somali government. The Duca d'Abruzzi set up the Estate and the factory in the 1920s and made contacts in the region and carried out negotiations for the cession of land (in return for gifts) as early as 1917 to 1919. His intentions were strongly supported by Sheik Ali Mohamoud Sabid, in those days the highest authority in the area.

The building of the canal system was achieved by means of unpaid, compulsory labour (slave labour) by the inhabitants of the area. The work of the land labourers was paid for only after production started (first cotton and peanuts and then, after 1925, sugar). (At this time only the strongest men were capable of working two contracts per day.)

The consultant assumes that the penetration of the market and money economy into the Jowhar region was closely linked with the foundation of the plantation and was decisively furthered by the building of the railway from Mogadishu to Jowhar in 1926 to 1927.

The recruitment of casual labour apparently did not create any difficulties for the company. It is reported that there were long queues of people looking for work and that most of the time the majority of them were turned away.

It can therefore be assumed that imported goods entered the region with the building of the estate and the railway but that the farmers at that time did not exchange their products for money to any great extent.

Anyone wanting to earn cash had to seek work on the plantation. (For comparison, wages and prices of the 1920s were : 1 contract = 6 lira; 1 shirt = 2.5 lira; 1 sheep 12 to 15 lire, best quality 20 lira. A regular employee in the factory earned 35 lira/week, which was regarded as a high income and a privileged position.)

SAIS/SNAI seems to have continued that role of being the most important employer, thus the main possibility for the rural population to earn cash money until recent years. As long as the population had no or only limited alternatives in earning cash (other employment and/or significant participation in marketing) and the wages for employment with SAIS/SNAI were comparatively high, the population of the areas surrounding the Estate remained interested in the jobs offered. (Some possible reasons for the changes in that attitude during the last 5 to 7 years is discussed below.)

The particular role of SAIS/SNAI is not only determined by its predominance in terms of monetary economy but also by another aspect.

From the point of view of the farmers the plantation, which is an enormous alien body in the middle of rather small, traditional farms, the management and the top staff have always represented an element of state power. Whether the

wielders of power were white and colonial or later local and compatriots certainly involves a series of qualitative and gradual distinctions; in the basic problem of subjection to authority of the poor labourers and farmers of the area it does not change the overall context. The real power of the general director of SAIS/SNAI was probaly never much less than that of the provincial governor. The management will always have had considerable opportunity to lobby successfully for the interests of the company.

It was presumably not particularly difficult for d'Abruzzi to organise the recruitment of compulsory labour, to quarter the labour force in barracks and to keep them under control when the canal system was being built. He was able to ensure that the establishment of further industrial or agro-industrial enterprises in the region of Jowhar (radius of 35 km) was forbidden, in order to prevent the dispersion of the labour force from the plantation (the ban remained in force until 1969).

Whether it was unpaid compulsory labour or relatively well-paid wage labour (in which parts of the population were even very interested) work for SAIS/SNAI, work on the plantation, was from the beginning a service for the authorities. If at some point cutters of sugar cane had been in short supply the shortage could, without doubt, have been overcome by force. (As was precisely the case with the construction of the irrigation system.) ("The Italians established a number of plantations, ... , relying on local farmers for labour which increasingly was only obtained at the point of the gun". Haakonsen, 1983, p 4.)

It is not difficult to show the elements of state pressure involved in the form of recruitment practised at present. This is probably particularly true of the last 5 years, during which SNAI has found it increasingly difficult to find casual labourers for the Estate.

The 'program for casual labour recruitment' of 30.3.1983 (SNAI) provides evidence that SNAI, by using its connections with subordinate representatives of various ministries (SNAI = Ministry of Industry, administrative representatives = Ministry of the Interior), can put considerable pressure on their various district officers and village councils, if not directly force them, to provide a certain amount of labour assistance. (The administrative structure of the state has reached down to the level of the village since the establishment of the 'buulo councils' in the villages, which are made up of 3 to 5 persons (partly appointed by higher administrative levels, who obligatorily are Party-members) and have replaced the traditional elected head of the village. The members of the 'buulo councils' are and feel responsible for the fulfilment of the directives (wishes?) of the authorities.)

Actual practice is, at the moment - according to the accounts of the village heads interviewed - that the representatives of SNAI state their labour needs from the village in question and the village heads then go from house to house persuading and ordering until the quota is met. The power of the village heads is not strongly developed. If somebody refuses to follow their directives (to work x days on the Estate), they have few sanctions at their disposal. The group which is then ready to be collected by the SNAI truck is usually smaller than it should be (or might not come together at all). Some members of the group then jump off the truck when it has reached their own fields and return to their own work. Women and children are over-represented in the quotas, as has been mentioned already.

As the work is badly paid and food and drinks are not provided, it is not only (as in earlier times) a question of willingness to work. Economic considerations are also involved, as the financial losses are regarded as a service for the state, as a kind of additional taxation: Because SNAI sugar estate happens to be in this area, the local population is forced to provide underpaid labour. The loss of freedom and income is perceived as an exercise of state power, which cannot be completely avoided. The pressure put on the populace by SNAI when the voluntary supply of labour is inadequate is therefore pressure on the part of the state: A dozen armed policemen from the office of the regional governor accompany the SNAI trucks to the villages. Those who can be found are picked up and no objections are tolerated. According to the village heads interviewed, this happens about once a year in each village. The question then remains : what work performance can one expect from individuals being 'recruited' that way?

Apart from the fact that SNAI jobs are not paid well enough and apart from the fact that the recruitment practices are unlikely to create a high social respect for those working on the plantation and a high attraction for the jobs provided, economic alterations seem to have reduced the population's dependency on the possibility of earning the cash needed with SNAI. The consultant assumes that at this point of development, SNAI/Jowhar has completely lost its function as a source of cash income in the region.

This assumption is based on the following consideration. The infrastructure created for SAIS (road and railway), which has served the marketing of the sugar and the maintenance of supplies to the Estate, also aided merchants in the implementation of sales transactions in the region. A certain amount of articles previously unknown in the every day life started to be offered and the population became interested in consuming them.

Primarily the cash funds needed - as far as the rural populace was concerned - was mostly earned by working for SAIS. There were - as mentioned above - no other possibilities.

The agro-industrial plant itself, the urban development of Jowhar, but in particular the urban development of the capital of Mogadishu developed a constantly increasing demand for staple food and other agricultural products. The good connection of the rural population with all these potential consumers, the easy access to respective markets enhanced the participation of the rural population in the marketing of their products.

It seems that nowadays the commerce with agricultural products plays the most important role in terms of cash income of the rural household. (We have assessed that only 25 to 33% of the total annual production is destined to private consumption in the theoretical example of a farm with approximately 3.5 ha under cultivation.)

A certain number of aspects made this shifting development (in terms of farmers' cash income) from wage labour (with SNAI) to cash returns from commerce drastic in the last few years :

- Series of factors impede SNAI in continuing the payment of attractive wages, some of which are: certain administrative changes in management; the collapse of the world price for sugar; the decline in crops as a result of soil deterioration, etc.

- As mentioned above, the rapid growth of the urban centre of Mogadishu (distance some 100 km) constitutes a constantly increasing demand for food items.

- Somalia is now experiencing severe inflation of prices. This includes all articles of everyday need, particularly imported goods and agricultural products. Rural wholesale prices of nutritional goods are - as mentioned above - at present prices about 1 to 2.5 times as high as European standards whereas the average income is about one tenth of a European labourer's salary. The marketing situation of agricultural products has been de-stabilised by administrational intervention in the late 1970s and early 1980s. As little as the price level for agricultural products can be considered to be 'normal', as little of this seems to count for the profit margin on which the farmers can count when selling at favourable condition: staple food marketing can bluntly be called usurious.

- A significant appearance of mechanical means of production within the agriculture around the SNAI/Jowhar Estate (mechanical ploughing) now permits an increasing group of better-off farmers to cultivate larger plots independently from the work-force their family-members can provide and supplement labour they used to hire. The returns of a farming family under such conditions is no longer a function of availability of physical work-force. In former times the soil-preparation was the bottle-neck of the production cycle. (A rather big amount of man-power needed for rather small a surface.) The surface under cultivation is now determined by the man-power needed for sowing, weeding and the harvest.

- The soil preparation with tractors is not only much faster than if done manually, it also is only half as costly. A farmer with regular access to ploughs for rent will not only be able to cultivate more land, he will also do this at less cost. He therefore can permit himself to pay higher rates for contracts in manual labour than he needs for further activities in the fields.

- The profitable marketing situation for agricultural products also affect those farmers whose income from farming, previously, was insufficient to cover all the household's needs and who were forced to search for supplement income (from casual labour mostly). Although the number of these cases is not determined, we assume that the above mentioned aspects have contributed to reducing the total availability of labour force potential in the area concerned.

- The increasing income from farming plus the decreasing need for income from casual labour has severely inflated the per-contract prices for casual labour. This brings SNAI with its demand for casuals into an even more unfavourable situation: not only that the competing farmers pay better by far, they also provide food and drinks, their jobs lie in the neighbourhood and are more highly appreciated than the ex-slave labour on the Estate.

Nevertheless, the risk of the present inflated interior market (including the commerce with agricultural products) is generally considered to be high. The belief that the current situation will last does not seem to be wide spread. The over-all economic climate can be called insecure. The production of all agricultural crops, has decreased if comparing the production of 1970 with 1980 (except rice) (World Bank, 1981).

As long as this situation lasts the consultant does not expect the population's negative attitude towards casual labour jobs with SNAI to alter and cannot see any particular economic need arising which could force the population to re-adapt former attitudes (dependency on SNAI-jobs plus high willingness to provide its labour-force).

The possibility of (significantly) increasing, e.g. the SNAI-payments per contract (which, as we assume, is already done to some extent informally) does not seem to be the solution. That would only start up competition for a small supply of work (little labour for high prices) and thus encourage further inflation on the regional labour market. It would also cause competition between lower (SNAI) and higher estimated (farmers') jobs. SNAI would be stuck with the disadvantage.

As far as the labour market is concerned the prospect of normalisation of the food market and a reduction of staple food prices to a more normal level, plus secured marketing and food supply would be much more effective. It would reduce the farmers' income making it impossible for them to leave (or try to leave) most of their work to hired hands. That condition, accompanied by payment increases for casual labour in the Estate (together with other services provided such as: food; drinks; medical treatment, etc.) could indeed be effective.

CHAPTER 4

CONCLUSIONS AND PROPOSALS

4.1 Assessing the Casual Labour Demand

According to the information provided by SNAI (Agricultural Department) in June 1983, the overall need for rural casual labourers amounts to approximately 3 000 jobs:

- approximately 1 500 persons needed constantly, throughout the entire year, for activities such as weeding, planting and irrigation;

- approximately 1 500 persons during the campaigns, of which approximately 750 are for cutting and 750 for loading; the campaign lasts about 240 days.

These figures are not realistic; neither justified by the actual production nor by the labour potentials of the area that we can expect to be attracted by SNAI jobs. First as recently stated by the Agricultural Department, a good cutter is supposed to make 3 to 4 contracts a day. If one contract represents 1.0 to 1.2 t of cane (a figure stipulated by SNAI), such numbers of labourers would produce (1.0 t/contract, 3.5 contracts/day, 240 days) 630 000 t of cane. The highest production ever achieved between 1963/64 and 1982/83 was 463 000 t (1970/71).

Second, using the SNAI casual labour recruitment programme of 30th March 1983 as a basis, the total population of the rural area from which casual labour is recruited is believed to be 16 500 inhabitants. (The urban population of Jowhar is supposed to play a minor or negligible role in SNAI's actual casual employment.) A demand for 3 000 persons, half of them working full time, the rest being at the disposal of SNAI 240 days out of the year, would mean the expectation that 18% of the population in the area (babies and aged people included) would work for SNAI. We do not believe that the readiness to work as a hired hand at present exceeds 1.0 person per household, rather that it is 0.7 person/household. In that case the total labour force potential of the area would be 2 660 persons (out of 3 800 households estimated). That group would have to satisfy the total demand for casual labour of the area, not only SNAI's.

Although the group of poorer farmers which are forced to earn supplementary money are not yet identified from a socio-economic point of view, (i.e., their number and actual dependency on further income as well as their obligations towards other employers), theoretically SNAI should be able to count on some 1 000 to 1 300 persons, about half of which are women and growing children. Despite the fact that these figures are only estimates, the conclusion is evident: in the near future SNAI will have to organise its production with very much less manpower than stipulated.

A prime objective of a pilot project concerned with the improvement of casual labour organisations must therefore be to achieve a significantly higher man/day productivity.

The information provided by SNAI indicates that the present man/day productivity (cutting and loading) is 3.7 t/d. This figure has little credibility. The HVA transport and harvesting specialist believes the actual man/day productivity is estimated to be 1.2 t (8 h/d, 30 t/cane/ha density). This ratio could be improved to 3.0 t/d (8 h/d at 90 t cane/ha density) after rehabilitation of the Estate.

HVA foresees that this ratio could be improved to 3.0 t/d (8 h/d at 90 t cane density/ha) in the final project stage.

If future production aims at 5 300 ha under cultivation with an annual production of 400 000 to 450 000 t of cane, such projections would result in a demand for approximately 600 cutters and 600 loaders. If, as up to now, the number of labourers needed for weeding, irrigation and planting stays approximately the same as that of the campaign demand, the future need for unqualified labour (if operating the entire plantation with manual cutting and loading) would be around 2 500 persons.

As stated above, it seems quite unrealistic to expect this demand to be met by the population of the area around Jowhar (10 000 km^2, approximately 16 500 inhabitants). To employ all 1 200 persons assumed to be available would need major activity on the part of SNAI in order to regain its attractiveness as an employer and, with that condition fulfilled, this would permit the operation of about half of the area envisaged (2 500 to 2 750 ha) with manual harvesting.

Therefore further options definitely must be considered:

- either attracting poor farmers from more distant areas and applying the improved settlement measures (described below) to them as well;

- or, restricting the employment figures of unqualified labour to approximately 1 200 persons, partly mechanising the production. As an alternative one could also consider fully mechanised work on parts of the area under cultivation.

In general improving the density of cane per ha and improving the productivity per man and day are prime objectives for the reduction of SNAI's demand for labour force.

Furthermore, unless labour force is attracted from areas other than those at present, the objective of cultivating 5 300 ha and producing 450 000 t of cane annually cannot be achieved if the labour recruitment methods as used today are continued. Mechanisation to some degree will be indispensable under such conditions.

4.2 Increased Attractiveness of SNAI Jobs

We do not believe that the model of casual labour recruitment as practised up to now (short term employment of certain contingents from different villages in the area, transported back and forth to areas under cultivation) can successfully operate in the future. Apart from increased payments per contract, SNAI employment must regain its previous high attractiveness. The present form of organising the campaigns with manual labour is unlikely to assure even the regular presence of 1 000 to 1 200 persons assumed to be available or to achieve a man/day productivity of 3.0 t as an average.

Therefore this chapter proposes a package of possible measures which all together (or in essential parts) could act as catalysts in achieving regular availability of casual labourers and the projected man/day productivity. These proposals are based on some assumptions, which are:

- there is no rural proletariat in the Jowhar area; there is no landless population entirely dependent on employment in the regional agriculture;

- there is a certain, still unidentified group of farmers depending on supplement cash income due to insufficient size of their family property;

- a high demand for rural labour force provides this group with sufficient possibilities to earn what they need;

- this group has a low social standard and is likely to be interested in improving its general living and working conditions.

To attract labour force to the Estate, we propose a model of 're-thinking the Estate settlement'. In contrast to the older settlements (Kaxarey, Shamento, Iga Dadab, Buulo Nave and Gumarey) which are small villages with small farms generally too small in size to assure a family's living, we believe a new settlement should consist of a larger, connected area available for a larger number of families. Such an area should be placed at a convenient distance to the areas envisaged for manual operation.

For new settlers SNAI should offer (under the condition that one person per household works regularly on the plantation):

- provision of (irrigated) land for agricultural exploitation and the housing needed by the family;

- provision of help in soil preparation with SNAI equipment during those periods of the year when equipment is not fully needed in the cane production. This service (mostly ploughing) should be provided at reduced costs as compared with the official market price for one hour's tractor rent;

- providing technical assistance in agriculture in order to improve the farmers' production in their traditional cultures, including sales of fertilisers, herbicides, etc. at cost;

- providing increased payments per contract for those working on the plantation;

- further benefits granted to Estate farmers should be provided depending on the degree of activeness (time present) on Estate fields. These could consist of:

  (a) free food and drinks when working on the plantation;

  (b) prophylactic medical treatment;

  (c) allowances to buy sugar (or other food items) in Estate shops at official prices (or at cost);

- good road connection between such settlement and Jowhar;

- help in commercialising the Estate farmers' surplus production (transport, storage, etc.);

- the right to exploit abandoned Estate land both as gazing land and for firewood.

Which of these proposals are practicable should be subject to further social and economic analysis.

The relationship between SNAI and its new settlers must be of high reliability. Services offered should be rendered promptly and according to a publicised schedule, whereas services connected with active work on the planatation should be strictly related to working performance, and persistent absenteeism should lead to the replacement of that particular family within the settlement scheme.

The settlement programme should be based on leasing the land and housing and the conditions under which such a leasing contract could be terminated should be made clear and eviction enforced if necessary.

As far as the person who works for SNAI is concerned, one should eventually think of abandoning the principle of casual work; it would be preferable always to have the same people working for SNAI and these people always to have, if possible, the same job (on rotated fields), working in a team that regularly works together and lives in the neighbourhood of new settlements, enabling them to build up a certain professional standard and specialisation (necessary for the desired man/day productivity) and social attachment to his working team. Those working for SNAI should, after a given period, obtain fixed employment with the company (just as was the case previously with unqualified labourers in the sugar factory).

The rest of the family should be able to cultivate their respective fields conveniently (with the said help from the company).

4.3 Proposals for Practical Proceeding

(a) Before a definite design of a pilot project 're-organisation of the SNAI manpower' is undertaken, a project pre-phase should be planned. Such a pre-phase should have the following objectives:

- economic analaysis of the different aspects of a new Estate settlement programme;

- identification, via an information compaign in the area concerned, of potential rural labourers willing to settle according to the programme proposed.

  This should include:

  (a) existing Estate settlements;

  (b) villages that had the highest frequency of sending casuals in the past;

  (c) other villages in the SNAI casual labour area;

  (d) poor farmers from other areas, eventually refugee camps, etc.;

  identification of an appropriate area for such a settlement in line with all other aspects concerning the rehabilitation of the Estate;

- determination of the size of an eventual pilot project (both in terms of the size of the cane field to be operated manually and in land plus the number of families to settle).

Such a project pre-phase could be executed in a period of 4 to 6 months, in the hands of an experienced SNAI staff member and a specialist in socio-economic and settlement programmes.

On the basis of all data collected and information obtained during this period, it should be possible:

- to decide whether the proposed settlement programme has realistic chances of succeeding;
- if the programme is unlikely to succeed, to propose alternative solutions;
- to draft the final project design for 're-organisation of the SNAI man-power'.

(b) The actual pilot project should last at least 3 years.

Year (1):

The farmers selected for a first settlement programme should work one full campaign at new payments per contract. They should preferably be recruited from nearby villages. If this is not possible they should be provided with provisional lodging as well as food and drinks in the fields. This campaign should be used to establish working teams, identify experienced and respected team leaders, study the man/day productivity more closely, etc.

At the same time the construction of houses and roads in and to the settlement area should be planned and executed, as well as the rehabilitation of the irrigation system where necessary. The planning and organisational preparation of all details of the settlement programme should be achieved.

From all labourers having performed well during the experimental campaign during year (1) of the pilot project those to receive definite settlement and leasing contracts would be chosen. Between the campaigns of year (1) and year (2) this group would be established in the settlement.

Year (2):

In the second year of the pilot project the programme would start fully, including soil preparation, technical assistance and commercialisation of agricultural products out of the settlement area.

The evaluation of year (2) should permit the analyses of problems met and the successes achieved. If the pilot project was successful in most of its aspects by the end of year (2) the programme could be enlarged and a second settlement programme could be initiated.

Year (3):

Unless being successful to the most important extent, year (3) should be used to improve organisation and administration of the running project and to take up contracts with further settlers.

It would largely depend on how the rehabilitation of the Jowhar Estate is finally organised, but from the viewpoint of rural manpower a settlement programme would at first hardly be able to include a group much larger than 200 to 250 persons (for employment, families not included). We expect such a programme to be the most attractive for young male farmers desiring to become independent and to get married, and for young, recently married couples with insufficient funds and land. Even if poor, larger families (including several generations) will be less likely to change their homes and way of living.

Nevertheless 200 to 250 persons to be recruited as workers for SNAI will mean a total population of at least 650 to 750 persons (in 200 to 250 households). In terms of land, in order to assure a decent living from farming, it would need about 3 ha per household, thus a total area of experimental settlement of 600 to 750 ha. To cultivate and irrigate this area, and to organise its population and production efficiently, will be a major task.

On the other hand, if it is assumed that these 250 persons produce 2.0 t/cane/d (half of them working as cutters, the other half as loaders) they would produce only approximately 60 000 t of cane in the first year. With an initial yield of 50 t of cane/ha density, this would correspond to an area of 1 000 to 1 200 ha.

Inevitably the rehabilitation programme must include further appropriate measures to achieve the production objectives. These could include the rehabilitation and repair of existing machinery and the levelling of the area necessary in order to start mechanised production.

Further harvesting could use casual labour recruited in the traditional way. But those labourers coming from the area from which future settlers have been selected would have little inclination to perform well, even if payments per contract were increased, the fact that a group of (even poorer) farmers were going to receive further services and grants would cause resentment.

Figure VI.1

Location of Villages in Snai Casual Labour Recruitment Program

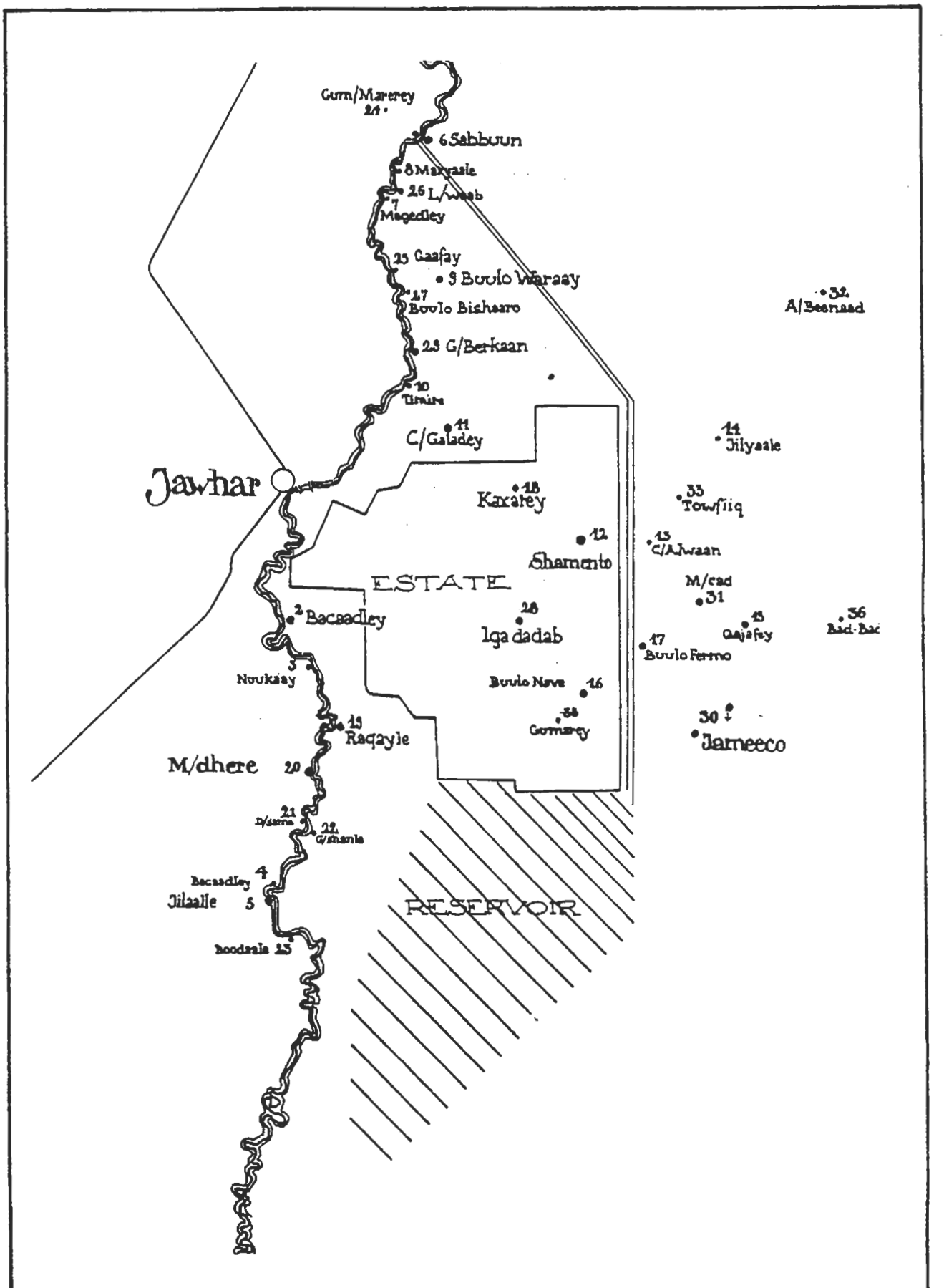
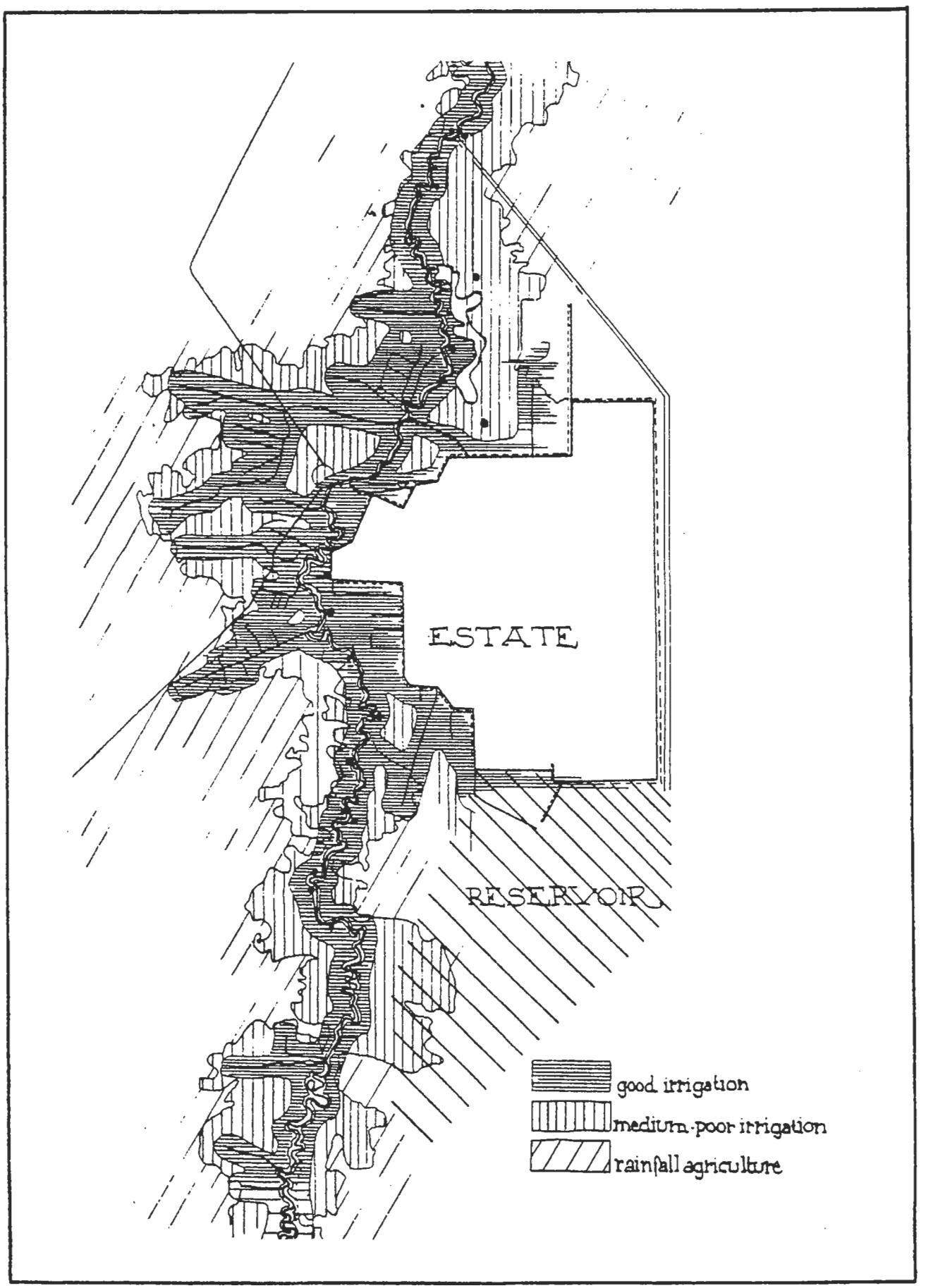


Figure VI .2

Agriculture in the Jowhar Area



APPENDIX A

SOMALIA: AREAS AND POPULATION DENSITY

	Region	Population ('000)	Area ('000 km^2)	Population density (population/km^2)
I	**Northwest**	**698**	**86**	**8.12**
	Wagoyi Galbeed	440	45	9.78
	Togdheer	258	41	6.29
II	**Northeast**	**386**	**174**	**2.22**
	Sanag	145	54	2.69
	Bari	154	70	2.20
	Nugal	87	50	1.74
III	**Central**	**397**	**113**	**3.51**
	Mudug	215	70	3.07
	Galguduud	182	43	4.23
IV	**Shabelle River**	**1 188**	**82**	**14.49**
	Hiraan	147	34	4.32
	Middle Shabelle	263	22	11.96
	Lower Shabelle	398	25	15.92
	Benadir	380	1	380.00
V	**Juba River**	**651**	**116**	**5.61**
	Gedo	212	32	6.63
	Middle Juba	216	23	9.39
	Lower Juba	223	61	3.66
VI	**Inter-riverine**	**402**	**66**	**6.09**
	Bakool	100	27	3.70
	Bay	302	39	7.74
TOTAL		3 722	637	5.84

Source : 1979 to 1981 Three Year Development Programme quoted from : World Bank 1981b, Table Nr 19.1.

APPENDIX B

INHABITANTS AND POPULATION GROWTH ('000)

Source	Years						Annual increase (%)
	1960	1970	1975	1976	1979	1980	
'Unofficial' census results used for 3 years Development Plan	-	-	3.722	-	-	4.150	2.2
'Unofficial' census results used by Livestock Department of Ministry of Planning	-	-	3.491	-	-	3.892	2.2
Ministry of Labour	-	-	3.500	-	-	3.818	2.8
International Labour Organisation	-	2.789	3.171	-	-	3.653	2.87
International Monetary Fund	-	-	-	-	3.500	3.591	2.6
1976 National Symposium Population Division of the Economic Community for Africa	2 .330	-	-	2.979	-	2.301	2.5

APPENDIX C

AGE OF VILLAGES IN SNAI CASUAL LABOUR RECRUITMENT AREA

Name of village	Existed before 1920	Created between 1920 and 1945	Created after 1945	Remarks
Beesha of South			x	(1)
Bayaxaw	x			
Nuukaay	x			
Bacaadley	x			
Jilaalle	x			
Sabuun	x			
Megedley	x			
Murryaale	x			(2)
B/waaray			x	x
Timire	x			
C/galdey		x		
Shameento		x		
C/Alwaan		x		
Jilyaale	x			
Qajarey		x		
Buulo Nave			x	
B/Feermo		x		
Kaxarey			x	
Ragadyle	x			
M/dhere	x			
D/same	x			
G/shanle	x			
Boodaale	x			
Gum/Marerey	x			
Gaafey	x			
L/waab	x			
B.Bishaaro	x			
Iga dadab			x	
G/barkaan	x			
Jameeco	x			
M/cad			x	
A/beenaad			x	
Towfiiq			x	
D/dheere	x			
Gumarey			x	
Bad-bad			x	

Note : (1) Village created when reservoir was built in order to settle inhabitants of three villages from the area now flooded.

(2) Oldest village in the area.

Source : Consultants interviews

APPENDIX D

Contacts

(a) in Mogadishu :

Hersi, Omar	Ministry of National Planning Director of Planning
Khere, Moh'd Herse	Ministry of National Planning Technical Department, Chief of Agricultural Section
Abdam, Hussein, Dr.	Somali Studies International Association
Ade, Huseen Moh'd	Trader
Basha Moh'd Farah	Trader
DeFehr, M.	UN High Commissioner for Refugees
Bakhet, Omar	UNHCR, Geneva
Helming, Stefan	GTZ, Consultancy project to Ministry of National Planning
Haakonsen, Jan	Anthropologist, Consultant to UNICEF - Somalia
Roark, Paula	Sociologist

(b) in Jowhar and area :

Sido, Omar	SNAI, General Manager
Hassan, Mr.	SNAI, Vice-General Manager
Abdillahi, Moh'd Sheik	SNAI, Factory Manager
Matani, Abra Deboc	SNAI, Administrational Manager
Sido, Jacob	SNAI, Personnel Manager
Axmad, Ibrahim Hussein	SNAI, Agricultural Manager
Nur, Moh'd Nur	SNAI, Vice-Agricultural Manager
Hussein, Moh'd	SNAI, Senior Staff
Anod, Osman	SNAI, Senior Staff
Omar, Moh'd	SNAI, Senior Staff
Nur, Hassan Hussein	Member of buulo council, Sabbun
Barey, Jussuf Abdi	Member of buulo council, Labawaab
Nur, Abdulkadar Hadj	Member of buulo council, Buulobisharo
Nur, Moh'd	Farmer, Buulobisharo
Omar, Abdullah Osman	Member of buulo council, Buuloshameento
Muchtar, Mahamed Hadj	Member of buulo council, Buulo Nave
Abdi, Ahli Moh'd	Member of buulo council, Mubaarak
Mao Hussein Mahamoud	Member of buulo council, Jameeco
Dhiro, Moh'd Ahmed	Cattle trader Jowhar
Nur, Moh'd Hadj	Staple-food trader, Jowhar
Elmi, Salad Moh'd	Member of buulo council, Buulowaarey
Farmer, market women, housewives	Jowhar and area

APPENDIX E

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World Bank	1981	Accelerated development in sub-Saharan Africa, Washington (quoted : WB 1981a).
World Bank	1981	Somalia agricultural sector review (3 volumes) Washington (quoted : WB 1981b).

ANNEX VII

CALCULATION OF OPERATIONAL COSTS OF SUGAR PRODUCTION AND FINANCIAL PROJECT COSTS

ANNEX VII

CALCULATION OF OPERATIONAL COSTS OF SUGAR PRODUCTION AND FINANCIAL PROJECT COSTS

CONTENTS

LIST OF TABLES

LIST OF TABLES (cont.)

CHAPTER 1

IRRIGATION AND DRAINAGE

CHAPTER 1

IRRIGATION AND DRAINAGE

Personnel

See Table VII.1.1 — So.Sh. 7,052,268

Consumables/Materials

	Irrigation (in So.Sh.)	Drainage (in So.Sh.)	Total (in So.Sh.)
Materials for structures 0.5% of capital cost at So.Sh. 132 m/m	660,000	-	660,000
Materials for structures 0.5% of capital cost at So.Sh. 74 m/m	-	370,000	370,000
Fuel and oil for pumping plant	810,000	2,600,000	3,410,000
Maintenance pumping plant	210,000	285,000	495,000
Syphons, tools	250,000	50,000	300,000
Stationery, etc.	50,000	50,000	100,000
Total consumables/materials	1,980,000	3,355,000	5,335,000

So.Sh. 5,335,000

Services

	hrs/kms Irrigation	Drainage	Total	
Dragline LS 78	900 hrs	2,300 hrs	3,200 hrs	
		at So.Sh. 210/hr =		So.Sh. 672,000
" LS 98	3,500 hrs	-	3,500 hrs	
		at So.Sh. 244/hr =		" 854,000
Poclain LC 80	1,600 hrs	-	1,600 hrs	
		at So.Sh. 168/hr =		" 268,800
" LC 90	500 hrs	1,100 hrs	1,600 hrs	
		at So.Sh. 173/hr =		" 276,800
D6 bulldozer	2,500 hrs	-	2,500 hrs	
		at So.Sh. 237/hr =		" 592,500
Frontloader	1,000 hrs	1,000 hrs	2,000 hrs	
		at So.Sh. 113/hr =		" 226,000
Motorgrader	350 hrs	300 hrs	650 hrs	
		at So.Sh. 177/hr =		" 115,050

Tippertruck	25,000 km	25,000 km	50,000 km	
		at So.Sh. 431/100 kms =	"	215,500
Tractor 75 HP	1,000 hrs	1,000 hrs	2,000 hrs	
		at So.Sh. 94/hr =	"	188,000
+ 2 trailers		at So.Sh. 7,105/year =	"	14,210
Tractor 75 HP	100 hrs	80 hrs	180 hrs	
		at So.Sh. 94/hr =	"	16,920
+ boomsprayer	100 hrs	80 hrs	180 hrs	
		at So.Sh. 8/hr =	"	1,440
4WD terrain vehicle	-	-	40,000 km	
		at So.Sh. 293/100 kms =	"	117,200
Pick-up	-	-	100,000 km	
		at So.Sh. 193/100 kms =	"	193,000
Motorbikes	-	-	200,000 km	
		at So.Sh. 76/100 kms =	"	152,000
Total services				So.Sh. 3,903,420
Total irrigation and drainage				So.Sh. 16,290,688

Cost per ha (: 5,300) = So.Sh. 3,074

Proportionally charged to:

- Plantcane	908 ha	17%	So.Sh.	2,769,417
- Ratoons	4,240 ha	80%	"	13,032,550
- Seedcane	152 ha	3%	"	488,721
	5,300 ha	100%	So.Sh.	16,290,688

TABLE VII.1.1

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
IRRIGATION AND DRAINAGE			
Agricultural Manager	1	5,076	15,228*)
Manager irrigation/drainsection	1	4,128	49,536
Distribution controller	1	3,176	38,112
Canal attendants/gate operators	22	2,040	538,560
Pump attendants:			
- irrigation	6	2,040	146,880
- drainage	3	2,040	73,440
- mechanic	1	2,040	24,480
Maintenance controller	1	3,176	38,112
Surveyor	1	2,040	24,480
Ass. surveyor	1	1,800	21,600
Surveyors/ labourers	4	1,200	57,600
Plant operators and drivers	25	2,040	-**)
Assistant plant operators and drivers	15	1,800	-**)
Artisans	5	2,040	122,400
Artisans' labourers	15	1,200	216,000
Plant supervisor	1	2,400	28,800
Maintenance foremen	6	2,400	172,800
Maintenance labour	60	1,200	864,000
Field irrigation supervisors	12	1,800	259,200
Irrigators	300	1,200	4,320,000
Records clerk	1	1,920	23,040
Typist/filing clerk	1	1,500	18,000
	483		7,052,268

*) Share 25% of total cost.

**) Included in running cost per hr/100 km rolling stock.

CHAPTER 2

AGRICULTURE

CHAPTER 2

AGRICULTURE

2.1 COST OF PRODUCTION OF SUGAR IN FINAL STAGE AFTER COMPLETION OF THE REHABILITATION PROGRAMME (CANE LANDS AND FACTORY) 5,300 ha

Bases

Milling capacity : 2,400 tons of cane per day of 24 hours during 230 operation days
Time efficiency : 85 per cent
Actual milling days : 195.5 days
Quantity of cane crushed : 469,510 tons
Sugar cane ratio : 10 per cent
Quantity of sugar produced: 46,950 tons

Assumptions

Constant mid 1983 prices
Manning requirements
Salaries/wages
Consumables/materials
Mechanical tillages
Transport services
— as proposed by experts

Summary cost (excl. contingencies, depreciation and cost of financing)

	Ref. page	Total cost (in So.Sh.)	Cost per ton of cane (in So.Sh.)	Cost per ton of sugar (in So.Sh.)
COST AT FIELD BEFORE HARVESTING	2	64,504,072	137.39	1,374
Cost of harvesting and of cane transport	16	30,665,810	65.31	653
Cost of roads/railway	20	2,431,534	5.18	52
COST OF CANE AT THE WEIGHBRIDGE		97,601,416	207.88	2,079
Civil engineering	21	3,951,328	======	84
Factory	24	39,969,988		851
General*)	29	19,427,832		414
COST PER TON OF SUGAR BEFORE DEPRECIATION AND COST OF FINANCING		160,950,564		3,428
		==========		=====

*) Cost of management unit not included.

TABLE VII.2.1

CALCULATION OF COST PER HA AND PER TON OF CANE AT FIELD BEFORE HARVESTING

	So.Sh.	ha		So.Sh. per ha	Tons of cane		So.Sh. per ton of cane
Cultivation plantcane	16,754,260	908		18,451.83	108,050		155.06
Cultivation ratoons	47,749,812	4,240		11,261.74	361,460		132.11
	64,504,072	5,148	average	12,529.93	469,510	average	137.39

TABLE VII.2.2

SUMMARY CULTIVATION PLANTCANE*)

	So.Sh.	So.Sh. per ha	So.Sh. per ton cane
Manual tillages	4,480,980	4,935.00	41.47
Consumables	1,618,002	1,781.94	14.97
Mechanical tillages	3,564,032	3,925.15	32.99
Seedcane/nurseries	3,530,757	3,888.50	32.68
Share maintenance irrigation/drainage	2,769,417	3,050.02	25.63
Share general cost cultivation	791,072	871.22	7.32
Total cultivation plantcane	16,754,260	18,451.83	155.05

*) 908 ha - 108,050 tons of cane

2.2. CULTIVATION PLANTCANE - 908 ha

Manual tillages	Mandays per ha	
Planting 50% - 454 ha x 17.5 m.d./ha Mechanical planting 50% - 454 ha x 2.5 m.d./ha	10	
Interplanting	2	
Weeding - 2 times	40	
Chemical weedcontrol	3	
Mechanical fertilizing	2	
Smut control - 5 times	10	
Maintenance ditches	20	
Pushing cane	1	
Growth measurements	2	
Flower counting	2	
Stalk counting	2	
Total manual tillages	94 x 908 ha = 85,352 mandays	
	x So.Sh. 52.50/manday	So.Sh. 4,480,980

Consumables	So.Sh. per ha	
Benlate: 1.04 kg/ha x 105% = 1.092 kg at So.Sh. 295/kg	322.14	
Fertilizer/Urea: 150 kg/ha x 102% = 153 kg at So.Sh. 2.70/kg	413.10	
Insecticide/BHc 26% WP 0.6 kg/ha x 105% = 0.63 kg at So.Sh. 90/kg	56.70	
Herbicides:		
Gesapax/ combi : 6 l/ha x 105% = 6.30 l at So.Sh. 115/l	724.50	
2.4D'Amine: 2 l/ha x 105% = 2.10 l at So.Sh. 50/l	105.--	
Gesapax H : 50% of area, 2 l/ha x 105% = 1.05 l at So.Sh. 110/l	115.50	
Various (tools, rubber gloves, etc.)	45.--	
Total consumables	1,781.94 x 908 ha	So.Sh. 1,618,002

CULTIVATION PLANTCANE (cont'd)

Mechanical tillages		hrs/ha	total hrs	So.Sh./ hr	So.Sh.
Stubble ploughing	D6	1.50	1,362	237	322,794
	implement		1,362	29	39,498
Subsoiling	D6	3.00	2,724	237	645,588
	implement		2,724	13	35,412
Ploughing	W100 HP	5.00	4,540	117	531,180
	implement		4,540	8	36,320
Harrowing	D4	2.50	2,270	153	347,310
	implement		2,270	7	15,890
Planing - 2 times	D4	2.50	4,540	153	694,620
	implement		4,540	20	90,800
Furrowing 50%	D4	1.00	454	153	69,462
	implement		454	12	5,448
Mechanical planting 50%	W75 HP	3.00	1,362	94	128,028
	implement		1,362	16	21,792
Chemical weedcontrol	W75 HP	1.00	908	94	85,352
	implement		908	8	7,264
Cultivation and fertilizing	W75 HP	2.00	1,816	94	170,704
	implement		1,816	10	18,160
Moulding	W75 HP	2.20	1,998	94	187,812
	implement		1,998	9	17,982
Chemical weedcontrol	W75 HP	1.00	908	94	85,352
(2nd time)	implement		908	8	7,264
Total mechanical tillages					3,564,032

Total cultivation plantcane (excl. nurseries/seedcane, share general cost cultivation and share cost irrigation/drainage) 9,663,014

TABLE VII.2.3

SUMMARY CULTIVATION RATOONS*)

	So.Sh.	So.Sh. per ha	So.Sh. per ton cane
Manual tillages	21,369,600	5,040.00	59.12
Consumables	5,704,666	1,345.44	15.78
Mechanical tillages	3,920,304	924.60	10.85
Share maintenance irrigation/drainage	13,032,550	3,073.71	36.06
Share general cost cultivation	3,722,692	877.99	10.30
Total cultivation plantcane	47,749,812	11,261.74	132.11

*) 4,240 ha - 361,460 tons of cane

2.3. CULTIVATION RATOONS - 4,240 ha

Manual tillages	Mandays per ha	
Burning trash	1	
Weeding - 2 times	50	
Chemical weedcontrol	2	
Mechanical fertilizing	1	
Smut control - 5 times	15	
Maintenance ditches	20	
Pushing cane	1	
Growth measurements	2	
Flower counting	2	
Stalk counting	2	
Total manual tillages	96 x 4,240 ha = 407,040 mandays	
	x So.Sh. 52.50/manday	So.Sh. 21,369,600

Consumables	So.Sh. per ha	
Benlate:		
1.04 kg/ha x 105% = 1.092 kg		
at So.Sh. 295/kg	322.14	
Fertilizer/Urea:		
200 kg/ha x 102% = 204 kg		
at So.Sh. 2.70/kg	550.80	
Herbicides:		
Gesapax/ : 3 l/ha x 105% = 3.15 l		
combi at So.Sh. 115/l	362.25	
2.4D'Amine: 1 l/ha x 105% = 1.05 l		
at So.Sh. 50/l	52.50	
Gesapax H : 50% of area, 1 l/ha		
x 105% = 0.525 l		
at So.Sh. 110/l	57.75	
Total consumables	1,345.44 x 4,240 ha	So.Sh. 5,704,666

CULTIVATION RATOONS (cont'd)

Mechanical tillages		hrs/ha	total hrs	So.Sh./ hr	So.Sh.
Trashraking	W75 HP	2 5	10,600	94	996,400
	implement		10,600	4	42,400
Offbarring and fertilizing	W75 HP	2 0	8,480	94	797,120
	implement		8,480	10	84,800
Chiseling	W75 HP	2 0	8,480	94	797,120
	implement		8,480	3	25,440
Reshaping	W75 HP	2 2	9,328	94	876,832
	implement		9,328	9	83,952
Chemical weedcontrol 50%	W75 HP	1 0	2,120	94	199,280
	implement		2,120	8	16,960
Total mechanical tillages					3,920,304
Total cultivation ratoons (excl. share general cost cultivation and share cost irrigation/drainage)					30,994,570

2.4. CULTIVATION OF NURSERIES - to be planted 152 ha

Manual tillages	Mandays per ha			
Burning trash	1			
Planting by hand	10			
Interplanting	2			
Weeding - 2 times	40			
Chemical weedcontrol	3			
Pushing cane	1			
Mechanical fertilizing	2			
Growth measurements	2			
Smut control - 5 times	10			
Flower and stalk counting	4			
Maintenance ditches	20			
Subtotal manual tillages	95 x 152 ha =	14,440	mandays	
Hotwatertreatment GMN		112	"	
Total manual tillages		14,552	mandays	
	x So.Sh. 52.50/manday		So.Sh.	763,980

Consumables			
At hectare cost equal to plantcane (So.Sh. 1,781.94/ha) x 152 ha	So.Sh.	270,855	
Wire baskets, rubber gloves, aprons	"	10,000	
Total consumables		So.Sh.	280,855

Mechanical tillages			
Tillages at hectare cost equal to plantcane (So.Sh. 3,925.15/ha) x 152	So.Sh.	596,623	
Maintenance hotwatertreatment plant	"	93,060	
Total mechanical tillages		So.Sh.	689,683

Total cultivation of nurseries	So.Sh.	1,734,518
Total preparation of seedcane	So.Sh.	1,125,600
Subtotal cultivation of nurserires and preparation of seedcane	So.Sh.	2,860,118
Share maintenance irrigation and drainage	So.Sh.	488,721
Share general cost cultivation	So.Sh.	139,601
Total cultivation of nurseries and preparation of seedcane	So.Sh.	3,488,440

2.5. PREPARATION OF SEEDCANE

To be cut for seedcane 152 ha
to new nurseries 152 : 7 = 24 ha
to young plantcane 908 : 7 = 128 ha
1,060 : 7 = 152 ha

Manual tillages	Mandays per ha		
For handplanting: 24 ha + 64 ha = 88 ha			
Cutting, cleaning, chopping	72		
Dipping	8		
Loading at nursery	16		
Unloading at plantfield			
Subtotal manual tillages	96 x 88 ha = 8,448 mandays		
For mechanical planting: 64 ha			
Cutting, cleaning	36		
loading at nursery	8		
Unloading at plantfield			
Subtotal manual tillages	44 x 64 ha = 2,816 "		
	11,264 mandays		
	x So.Sh. 52.50/manday =	So.Sh.	591,360

Consumables					
Lysol	20 l	at So.Sh. 50/l	= So.Sh.	1,000	
Bags	200	at So.Sh. 12/bag	= "	2,400	
Bushknives	10	at So.Sh. 200/knive	= "	2,000	
Total consumables				So.Sh.	5,400

Mechanical tillages

Transport of 56 tons (net/ha) x 152 ha = 8,512 tons seedcane
or 118 tons per day; 4 trips per day of 6 units
(5.0 tons per trip)

W75 HP :		
72 days x 10 hrs/day with 6 units = 4,320 hrs at So.Sh.94/hr =	So.Sh.	406,080
Trailer :		
72 days x 10 hrs/day with 6 units = 4,320 hrs at So.Sh.14/hr =	"	60,480
Grabloader:		
72 days x 5 hrs/day = 360 hrs at So.Sh. 173/hr =	"	62,280
Total mechanical tillages	So.Sh.	528,840
Total preparation of seedcane	So.Sh.	1,125,600

2.6. CULTIVATION - GENERAL COST
(excl. diversification, irrigation/drainage)

Personnel

See page 12	So.Sh. 3,038,040

Consumables

Stationery, bicycle allowances, sundries	150,000

Services

		at So.Sh.	So.Sh.	
Mobile workshop	25,000 km	331/100 km	82,750	
Fuel-/oil unit	12,500 "	319/100 "	39,875	
Bus/truck for labourers' transport	40,000 "	281/100 "	112,400	
Trucks	60,000 "	388/100 "	232,800	
4WD terrain vehicles	50,000 "	293/100 "	146,500	
Pick-ups	140,000 "	193/100 "	270,200	
Motorbikes	180,000 "	76/100 "	136,800	
Fertilizer-/watertransport				
- W75 HP	3,000 hrs	94/hr	282,000	
- Trailers	6,000 "	14/hr	84,000	
Tractor/trailers for tyre repair	750 "	104/hr	78,000	
Total services				" 1,465,325
				So.Sh. 4,653,365

Proportionally charged to:			
- Plantcane	908 ha	17%	So.Sh. 791,072
- Ratoons	4,240 ha	80%	" 3,722,692
- Seedcane	152 ha	3%	" 139,601
	5,300 ha	100%	So.Sh. 4,653,365

TABLE VII.2.4

MANNING REQUIREMENTS

	Number proposed	Cost per month/per man	Cost per year	
GENERAL SUPERVISION				
AGRICULTURAL DEPARTMENT				
Agricultural Manager	1	5,076	30,456*)	50% cultiv.; 25% irrig./ drainge; 25% harvest./ transport
Chief Clerk	1	1,920	23,040	
Manager Farms	1	4,128	49,536	
Section Managers Plantation	6	3,176	228,672	
Field Foremen	6	2,400	172,800	
Senior Headmen	6	2,040	146,880	
Headmen	56	1,800	1,209,600	
Clerks	12	1,500	216,000	
Office messengers	6	1,200	86,400	
Storekeeprs	6	1,500	108,000	
Store labourers	6	1,200	86,400	
Laboureres plantation village	24	1,200	345,600	
Manager Mechanisation	1	4,128	49,536	
Field Foremen	4	2,400	115,200	
Senior Headmen	4	2,040	97,920	
Clerks	4	1,500	72,000	
	144		3,038,040	

*) Share 50% of annual cost

CHAPTER 3

FACTORY

CHAPTER 3

FACTORY

Estimated production in final stage
- Cane 469,510 tons
- Sugar 46,950 tons

Personnel

See Table VII.3.1.	So.Sh.	8,810,448

Consumables

- Furnace oil for boilers: est. 250,000 l at So.Sh. 3.50/l	So.Sh.	875,000
- Lubricants: 0.15 l per ton cane = 70,500 l at So.Sh. 20/l	"	1,410,000
- Diesel fuel for power plant: 748,000 l at So.Sh. 6.70/l	"	5,011,600
- Lubricants for power plant : 21,384 l at So.Sh. 20.00/l	"	427,680

- Processing consumables	Consumption per 100 t cane	Consumption total (in tons)			
- hydrated lime	130 kg	615	at So.Sh.	2,000/ton	" 1,230,000
- caustic soda	8 "	40	at "	5,500/ton	" 220,000
- tripple superphosphate	45 "	215	at "	4,500/ton	" 967,500
- various chemicals					" 250,000

- Sugarbags (100 kg sugar per bag) - 469,500 bags x 1.02 479,000 bags at So.Sh. 12/bag	"	5,748,000
- Filtercloth and various consumables	"	250,000
Total consumables	So.Sh.	16,389,780

Spareparts

Replacement cost equipment 2,400 t.c.d. factory est. So.Sh. 480 m/m.		
Spareparts consumption - to keep equipment in good running condition - 3% of replacement cost, 3% x So.Sh. 480 m/m	So.Sh.	14,400,000

Transport services

- Transport spares, consumables, etc.		
- tractor 75 HP: 2,000 hrs at So.Sh. 94/hr	So.Sh.	188,000
- trailers : 2 trailers at So.Sh. 7,105/year	"	14,210
- Pick-Ups : 75,000 kms at So.Sh. 193/100 kms	"	144,750
- Motorbikes : 30,000 kms at So.Sh. 76/100 kms	"	22,800
Total transport services	So.Sh.	369,760
Total factory	So.Sh.	39,969,988

Cost per ton of sugar So.Sh. 851,33

TABLE VII.3.1

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
FACTORY			
Factory Manager	1	5,076	60,912
- Secretary/typist	1	1,920	23,040
- Messenger	1	1,200	14,400
Technical Manager	1	4,680	56,160
Production Manager	1	4,680	56,160
Mechanical service			
Mechanical Engineer	1	3,176	38,112
Shift Engineers 3 x 1	3	3,176	114,336
Clerk Mech. Office	1	1,920	23,040
Foreman fact. yards/pumps	1	2,400	28,800
Mechanics fact. yards/pumps	4	2,040	97,920
Foreman heavy transport	1	2,400	28,800
Attendant heavy transport	4	1,200	57,600
Foreman cane unloading daily	1	2,040	24,480
Attendants cane unloading daily	3	1,200	43,200
Foremen cane unloading shift 3 x 1	3	2,040	73,440
Ass. Foremen cane unloading shift 3 x 1	3	2,040	73,440
Attendants cane unloading shift 3 x 10	30	1,200	432,000
Foreman mills daily	1	2,400	28,800
Foremen mills shift 3 x 1	3	2,400	86,400
Attendants mills shift 3 x 5	15	1,200	216,000
Foreman boilers daily	1	2,460	29,520
Attendants boilers daily	2	1,200	28,800
Foremen boilers shift 3 x 1	3	2,460	88,560
Attendants boilers shift 3 x 7	21	1,200	302,400
Foremen mill turbines shift 3 x 1	3	2,040	73,440
Foremen turbogenerators shift 3 x 1	3	2,400	86,400
Attendants turbogenerators shift 3 x 1	3	1,200	43,200
Mechanics boiling house	7	2,040	171,360
Instrument Technician	1	2,280	27,360
Attendant instruments	1	1,200	14,400
Electrical service			
Electrical Engineer	1	3,176	38,112
Foreman	1	2,040	24,480
Electricians daily	5	2,280	136,800
Electricians shift 3 x 5	15	2,280	410,400
Foreman electr. repair outside factory	1	2,040	24,480
Ass. foreman repair outside factory	2	2,040	48,960
Electricians	4	2,040	97,920
c/f	153		3,223,632

TABLE VII.3.1 (cont.)

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
b/f	153		3,223,632
Sugar production service			
Shift process supervisors 3 x 1	3	3,176	114,336
Ass. shift proces supervisors 3 x 1	3	2,160	77,760
Attendants clarification shift 3 x 4	12	1,200	172,800
Attendants juice heaters 3 x 1	3	1,200	43,200
Foremen evaporation 3 x 1	3	2,160	77,760
Attendants evaporation 3 x 1	3	1,200	43,200
Panboilers boiling plant 3 x 3	9	2,160	233,280
Attendants boiling plant 3 x 3	9	1,200	129,600
Attendants crystallizers plant 3 x 6	18	1,200	259,200
Foremen centrifugals plant 3 x 1	3	2,040	73,440
Attendants centrifugals plant 3 x 5	15	1,200	216,000
Foremen sugarhandling plant 3 x 1	3	2,040	73,440
Attendants sugarhandling shift 3 x 3	9	1,200	129,600
Foreman bagasse handling 3 x 1	3	2,040	73,440
Attendants bagasse handling 3 x 3	9	1,200	129,600
Foreman maintenance 3 x 1	3	2,040	73,440
Mechanics maintenance 3 x 3	9	2,040	220,320
Foreman factory cleaning	1	2,040	24,480
Cleaners factory	9	1,200	129,600
Foreman evaporator cleaning	1	2,040	24,480
Cleaners evaporator	4	1,200	57,600
Cane weighbridges			
Chief clerk 3 x 2	6	1,920	138,240
Clerks 3 x 2	6	1,500	108,000
Alcohol production service			
Plant Manager	1	3,176	38,112
Ass. Plant Manager	1	2,160	25,920
Foremen shift 3 x 1	3	2,160	77,760
Attendants shift 3 x 5	15	1,200	216,000
Laboratory services			
Chief Chemist	1	3,176	38,112
Ass. Chief Chemist	1	2,160	25,920
Analyst for spec. analyses lab. fact.	1	2,160	25,920
Lab. clerks lab. fact. shift 3 x 1	3	1,920	69,120
Analyst for routine analyses lab. fact. shift 3 x 4	12	1,500	216,000
Samplers lab. fact. shift 3 x 1	3	1,200	43,200
c/f	338		6,622,512

TABLE VII.3.1 (cont.)

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
b/f	338		6,622,512
Analyst lab. distillery	1	1,920	23,040
Sampler lab. distillery	1	1,200	14,400
Cleaner lab. distillery	1	1,200	14,400
Oxygen Section			
Supervisor	1	2,400	28,800
Attendant	1	1,200	14,400
Foremen shift 3 x 1	3	2,160	77,760
Attendants shift 3 x 1	3	1,200	43,200
Technical Service/Design Section			
Mechanical Engineer	1	3,176	38,112
Ass. Mechanical Engineer	1	2,400	28,800
Draughtsmen	2	2,400	57,600
Foremen mobile maintenance	2	2,400	57,600
Mechanics daily	19	2,040	465,120
Mechanics shift 3 x 2	6	2,040	146,880
Workshops			
Workshop Manager	1	4,680	56,160
Boiler shop supervisor	1	3,176	38,112
Blacksmiths	2	2,220	53,280
Welders	3	2,220	79,920
Sheetmetal workers	5	2,220	133,200
Labourers	2	1,200	28,800
Machine shop supervisor	1	3,176	38,112
Machinists	12	2,220	319,680
Pump mechanics	2	2,220	53,280
Bench mechanics	6	2,220	159,840
Welders	2	2,220	53,280
Labourers	2	1,200	28,800
Storekeeper	1	1,920	23,040
Carpenter shop supervisor	1	3,176	38,112
Carpenters	12	2,220	319,680
Plumbers	2	2,220	53,280
Masons	2	2,220	53,280
Labourers	4	1,200	57,600
Total Factory	441		9,220,080
of which distillery	23		409,632
Balance	418		8,810,448

CHAPTER 4

HARVESTING AND CANE TRANSPORT

CHAPTER 4

HARVESTING AND CANE TRANSPORT

HARVESTING AND CANE TRANSPORT

Estimated production of cane in final stage

5,148 ha x 91 ton/ha = rounded off 469,510 tons

Personnel

See Table VII.4.1		So.Sh. 10,802,265

Consumables

Cane knives:	total required about 1,000 knives; yearly consumption 200 knives at So.Sh. 200/knive	So.Sh.	40,000
Meals :	166,393 mandays at So.Sh. 3/manday, rounded off (cost for shoes/clothes, etc. not taken into account; it is assumed that these cost are included in the cost per manday for cane cutter at So.Sh. 60)	So.Sh.	500,000
Various :	Maintenance cane knives, stationary, etc.	So.Sh.	35,000
		So.Sh.	575,000

Transport services

- Cane transport/haulage:
  The cane will be loaded by means of grabloaders during 24 hrs/day. It is estimated that about 1/3 of the total amount of cane is transported directly by tractors/trailers to the factory from the nearby fields, whereas the remaining 2/3 is brought in by rail transport. All cane transported in railcarts needs to be transloaded.
  Light units will operate in 3 areas at the same time during 12 hours per night.

Grabloaders	: 10,434 hrs at So.Sh. 173/hr =	So.Sh.	1,805,082
In-field-/roadtransport			
- Tractors 75 HP (4WD)	: 36,738 hrs at So.Sh. 113/hr =	"	4,151,394
- Trailers 8 ton	: 36,738 hrs at So.Sh. 14/hr =	"	514,332
In-field transport to transloading statios			
- Tractors 75 HP (4WD)	: 43,114 hrs at So.Sh. 113/hr =	"	4,871,882
- Trailers 4.5 ton	: 36,228 hrs at So.Sh. 11/hr =	"	948,508

Transport services (cont'd)

Railway transport					
- Locomotives	: 31,395 hrs	at So.Sh.	99/hr	= So.Sh.	3,108,105
- Railcarts	: 313,950 hrs	at So.Sh.	5/hr	= "	1,569,750
Transloader	: 5,217 hrs	at So.Sh.	201/hr	= "	1,048,617
Light units:	: 22,080 hrs	at So.Sh.	25/hr	= "	552,000
40 seat bus-truck	: 40,000 kms	at So.Sh.	352/100 km	= "	140,800
Mobile workshop	: 25,000 kms	at So.Sh.	331/100 km	= "	82,750
Fuel-/oil unit	: 12,500 kms	at So.Sh.	319/100 km	= "	39,875
Tractor/trailers for tyre repair	: 750 hrs	at So.Sh.	104/hr	= "	78,000
Total cane transport/haulage				So.Sh.	18,911,095
- Supervision personnel					
4WD terrain vehicle	: 40,000 kms	at So.Sh.	293/100 km	= So.Sh.	117,200
Pick-ups	: 125,000 kms	at So.Sh.	193/100 km	= "	241,250
Motorbikes	: 25,000 kms	at So.Sh.	76/100 km	= "	19,000
Total supervision personnel				So.Sh.	377,450
Total transport services				So.Sh.	19,288,545
Total harvesting and cane transport				So.Sh.	30,665,810

Summary of operating cost (excl. depreciation)

	Personnel	Consumables	Transport serv.	Total
Harvesting	9,909,405	550,000	-	10,459,405
Supervision 50%	446,430	-	188,725	635,155
	10,355,835	550,000	188,725	11,094,560
Cane transport	Included in cost rolling stock/hr/100 km	25,000	18,911,095	18,936,095
Supervision 50%	446,430	-	188,725	635,155
	446,430	25,000	19,099,820	19,571,250
Total	10,802,265	575,000	19,288,545	30,665,810

Operating cost in So.Sh. per ton of cane (excl. depreciation)

	Personnel	Consumables	Transport serv.	Total
Harvesting	22.06	1.17	0.40	23.63
Cane transport	0.95	0.05	40.68	41.68
Cost per ton cane	23.01	1.22	41.08	65.31

TABLE VII.4.1

MANNING REQUIREMENTS

	Number proposed	Cost per month per man	Cost per year	
HARVESTING AND CANE TRANSPORT				
Agricultural Manager	1	5,076	15,228[1]	
Harvesting and Transport Manager	1	3,176	38,112	
Transport Supervisor	1	2,760	33,120	
Foremen Transport Section	4	2,400	115,200	
Headmen Transport Section	9	2,040	220,320	
Drivers/Operators	110	- [2]	-	
Cane collectors in field	20	- [3]	241,500	4,600 mandays
Cane collectors roads	3	- [3]	36,225	690 mandays
Harvesting supervisor	1	2,760	33,120	
Foremen harvesting	4	2,400	115,200	
Headmen harvesting	12	2,040	293,760	
Cane cutters	± 800	- [4]	9,390,180	156,503 mandays
Foremen burning	1	2,400	28,800	
Labourers burning	20	- [3]	241,500	4,600 mandays
	± 987		10,802,265	

Notes:

[1]) Share: 25% of total cost
[2]) Cost for drivers/operators included in cost per hr/100 km rolling stock
[3]) Cost per manday So.Sh. 52.50
[4]) Cost per manday So.Sh. 60.-; capacity of cutter per day: 3 ton cane

4.2. F.M.T. WORKSHOP

Personnel

See Table VII.4.2	So.Sh.	3,903,504

Consumables

Light diesel fuel, petrol, lubricants, tyres, spareparts calculated in running cost per hr/100 km per vehicle.		
Tools, stationery, etc.	"	400,000

Services

Services to be carried out by F.M.T. workshop - mobile workshop, fuel-oil unit - as well as transport cost of supervisory personnel F.M.T. workshop, budgetted under general cost cultivation and harvesting and cane transport		-

General charges

Insurance rolling stock	"	500,000
Overhead cost F.M.T. workshop	So.Sh.	4,803,504
Included in running cost rolling stock per hr/100 km and maintenance cost irrigation	"	4,803,504
Balance	So.Sh.	-

TABLE VII.4.2

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
F.M.T. WORKSHOP			
F.M.T. Workshop Manager	1	5,076	60,912
Ass. F.M.T. Workshop Manager	1	4,200	50,400
Administrator	1	3,176	38,112
Clerks cost control/adm.	3	1,920	69,120
Foreman	1	2,400	28,800
Clerk transport	1	1,920	23,040
Storekeepers	2	1,500	36,000
Labourers	4	1,200	57,600
Heavy Plant + Wheeltractor Section			
Engineer	1	3,600	43,200
Foremen	4	2,760	132,480
Mechanics	32	16 x 2,400	460,800
		16 x 2,040	391,680
Welders	5	2,400	144,000
Painter	1	2,160	25,920
Labourers	10	1,200	144,000
Motorvehicle section			
Engineer	1	3,600	43,200
Foremen	4	2,760	99,360
Mechanics	16	8 x 2,400	230,400
		8 x 2,040	195,840
Electricians	7	4 x 2,400	115,200
		3 x 2,040	73,440
Parcelbeater	1	2,400	28,800
Painter	1	2,160	25,920
Labourers	5	1,200	72,000
General			
Engineer	1	3,600	43,200
Foremen mobile units/irrigation pumps	3	2,760	99,360
Foreman locomotives	1	2,760	33,120
Foreman railcart/railrepair	1	2,760	33,120
Foreman Workshop camp IV	1	2,760	33,120
Mechanics mobile units/irrigation pumps	6	2,400	172,800
Mechanics locomotives	8	2,400	230,400
Mechanics railcart/railrepair	4	2,040	97,920
Mechanics Workshop camp IV	3	2,400	86,400
Welders mobile units/irrigation pumps	2	2,400	57,600
Welder locomotives	1	2,400	28,800
Welders railcart/railrepair	2	2,400	57,600
Welder Workshop camp IV	1	2,400	28,800
Labourers mobile units/irrigation pumps	6	1,200	86,400
Labourers locomotives	2	1,200	28,800
Labourers railcart/railrepair	10	1,200	144,000
Labourers Workshop camp IV	2	1,200	28,800
Storekeeper camp IV	1	1,920	23,040
Total F.M.T. Workshop	156		3,903,504

4.3. ROADS/RAILWAY

Primary roads	- 18 km	"mud"roads with a width of about 8 meters
Secondary roads	- 60 km	
Field-roads	- 100 km	
Railway network	- 60 km	

Annual maintenance

- Primary/secondary roads per km				
. gravel loading: 40 m^3 at So.Sh. 10/m^3	So.Sh.	400		
. transport: 960 km at So.Sh. 431/100 km	"	4,138		
. motorgrader: 20 hrs at So.Sh. 248/hr	"	4,960		
. 2 mandays at So.Sh. 52.50/day	"	105		
. total cost per km	So.Sh.	9,603		
for 78 km			So.Sh.	749,034
- Field-roads per km				
. motorgrader/roadroller: 15 hrs at So.Sh. 248/hr	So.Sh.	3,720		
. 2 mandays at So.Sh.52.50/day	"	105		
. total cost per km	So.Sh.	3,825		
for 100 km			"	382,500
- Railway network:				
. cost of personnel for repairs	So.Sh.	300,000		
. spareparts/replacements	"	1,000,000		
			"	1,300,000
Total roads/railway			So.Sh.	2,431,534

4.4. CIVIL ENGINEERING
(Building department)

Personnel

See Table VII.4.3			So.Sh. 1,661,568

Materials/consumables

Materials for maintenance:			
- industrial buildings	So.Sh.	600,000	
- furniture factory, workshops	"	150,000	
- houses (incl. camps) and other facilities	"	800,000	
- furniture houses and other facilities	"	200,000	
	So.Sh.	1,750,000	
- stationery, tools	"	100,000	
- protective devices, uniforms	"	100,000	
			" 1,950,000

Transport services

- Transport materials:			
- tractor 75 HP:			
2,000 hrs at So.Sh. 94/hr	So.Sh.	188,000	
- trailers:			
2 trailers at So.Sh. 7.105/year	"	14,210	
- Tractor 75 HP with:			
- cesspool emptier:			
1,000 hrs at So.Sh. 101/hr	"	101,000	
- Pick-up:			
15,000 kms at So.Sh. 193/100 kms	"	28,950	
- Motorbike:			
10,000 kms at So.Sh. 76/100 kms	"	7,600	
			" 339,760
Total Civil Engineering			So.Sh. 3,951,328

TABLE VII.4.3

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
CIVIL ENGINEERING			
Civil Engineer	1	4,128	49,536
Building Inspector	1	3,176	38,112
Draughtsman	1	2,400	28,800
Clerk	1	1,920	23,040
Typist	1	1,500	18,000
Messengers	2	1,200	28,800
Storekeeper	1	1,500	18,000
Foremen	2	2,400	57,600
Ass. foremen	2	2,280	54,720
Headmen	3	2,160	77,760
Masons	15	2,040	367,200
Carpenters	15	2,040	367,200
Painters	10	2,040	244,800
Labourers	20	1,200	288,000
	75		1,661,568

CHAPTER 5

GENERAL SERVICES, SUMMARY OF OPERATIONAL COSTS

CHAPTER 5

GENERAL

Personnel

See Table VII.5.1			So.Sh. 8,799,752

Materials/consumables

- Stationery	So.Sh.	800,000	
- Medicines	"	1,100,000	
- Foodstuffs (hospital and guesthouse)	"	450,000	
- Uniforms	"	175,000	
- Tools/laboratory instruments	"	50,000	
- Cleaning materials and sundries	"	175,000	
- Maintenance office equipment	"	200,000	
			2,950,000

General expenses

- Legal-, secretarial fees	So.Sh.	50,000	
- Licenses, subscriptions	"	50,000	
- Postage, telephone and radio	"	150,000	
- Recruitment	"	300,000	
- Training (incl. salaries during training)	"	2,000,000	
- Entertainment	"	250,000	
- Sports and games	"	300,000	
- Medical expenses outside estate	"	150,000	
- Insurance premium (excl. rolling stock)	"	2,000,000	
- Public relations	"	150,000	
- Sundries	"	150,000	
			" 5,550,000

Transport services

- Sedan:		
50,000 kms at So.Sh. 257/100 kms	So.Sh.	128,500
- Pick-up:		
250,000 kms at So.Sh. 193/100 kms	"	482,500
- Ambulance:		
15,000 kms at So.Sh. 501/100 kms	"	75,150

- Bus/truck (40 seats):			
70,000 kms at So.Sh. 352/100 kms	"	246,400	
- Bus (15 seats):			
40,000 kms at So.Sh. 281/100 kms	"	112,400	
- Motorbikes:			
230,000 kms at So.Sh. 76/100 kms	"	174,800	
- Truck:			
40,000 kms at So.Sh. 388/100 kms	"	155,200	
- 4WD terrain vehicle:			
50,000 kms at So.Sh. 293/100 kms	"	146,500	
- Tractor 75 HP:			
6,000 hrs at So.Sh. 94/hr	"	564,000	
- Trailers:			
6 trailers at So.Sh. 7,105/year	"	42,630	
			" 2,128,080
Total general			So.Sh. 19,427,832

TABLE VII.5.1

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
GENERAL			
Board of Directors	4	fee	50,000
General Management			
General Manager	1	7,272	87,264
Deputy General Manager	1	6,174	74,088
Personal secretary to General Manager	1	3,176	38,112
Typist	1	1,920	23,040
Monitoring and planning			
Head of planning service	1	3,176	38,112
Planning officer	1	2,460	29,520
Draughtsman	1	2,400	28,800
Clerk/typist	1	1,500	18,000
Office messenger	1	1,200	14,400
Agronomy			
Agronomist	1	4,980	59,760
Assistant Agronomist	1	4,128	49,536
Section Manager Experimentation	1	3,176	38,112
Foremen experimentation/laboratory	2	2,400	57,600
Headmen epxerimentation/laboratory	5	1,800	108,000
Clerks	3	1,500	54,000
Typist	1	1,500	18,000
Messenger	1	1,200	14,400
Labourers/lab. assistants	30	1,200	432,000
Training			
Head of orientation and training service	1	3,176	38,112
Training coordinator	1	2,460	29,520
Training superintendant	1	2,400	28,800
Secretary/typist	1	1,500	18,000
Internal audit			
Internal auditor	1	5,076	60,912
Assistant internal auditor	1	2,460	29,520
Audit clerk	1	1,920	23,040
Typist	1	1,500	18,000
Office messenger	1	1,200	14,400
c/f	67		1,493,048

TABLE VII.5.1 (cont.)

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
b/f	67		1,493,048
Mogadishu office			
Office Manager	1	5,076	60,912
Personal secretary to Office Manager	1	3,176	38,112
Purchasing officers	2	2,460	59,040
Insurance-, transport- and clearance officers	2	1,920	46,080
Clerks/typists	2	1,500	36,000
Driver	1	2,040	Included in km tariff rolling stock
Messengers	2	1,200	28,800
Finance and Administration Department			
Financial Manager	1	5,076	60,912
Chief accountant	1	3,176	38,112
Typists	2	1,500	36,000
Messengers	2	1,200	28,800
Accounts, cash, budgets, general			
Senior accountants	3	2,820	101,520
Accountants/Ass. accountants	6	2,460	177,120
Chief cashier	1	2,820	33,840
Cashier/clerks	6	1,920	138,240
Machine operators	3	1,500	54,000
Salaries/wages administration			
Accountant	2	2,460	59,040
Clerks	10	1,500	180,000
Stores accounts			
Accountant	1	2,460	29,520
Clerks	4	1,920	92,160
Machine operator	1	1,500	18,000
Stores			
General stores officer	1	2,820	33,840
Store officers	3	2,460	88,560
Storekeepers	3	1,920	69,120
Clerks/storemen	8	1,500	144,000
Messengers	2	1,200	28,800
Labourers/porters	10	1,200	144,000
Typists	2	1,500	36,000
c/f	150		3,353,576

TABLE VII.5.1 (cont.)

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
b/f	150		3,353,576
Stores finished goods			
Stores officer	1	2,460	29,520
Stores clerks	3	1,500	54,000
Storemen	9	1,200	129,600
Pilers/helpers	15	1,200	216,000
Purchase and sales			
Senior purchasing/sales officer	1	3,176	38,112
Purchasing officer	1	2,460	29,520
Marketing officer	1	2,460	29,520
Ass. purchasing officers	2	1,920	46,080
Insurance/transport/clearance officers	2	1,920	46,080
Sales officers	2	1,920	46,080
Clerks/typists	3	1,500	54,000
Messengers	2	1,200	28,800
Personnel & Industrial Relations Dept.			
Admin. & Pers. Manager	1	5,076	60,912
Senior Adm. & Pers. officer	1	3,176	38,112
Admin. officer	1	2,460	29,520
Admin. assistant	1	1,920	23,040
Personal secretary	1	1,920	23,040
Typists	3	1,500	54,000
Post/registery clerks	2	1,500	36,000
Telephone operators	3	1,500	54,000
Messengers	2	1,200	28,800
Personnel			
Industrial Relations officer	1	3,176	38,112
Personnel officer	1	2,460	29,520
Personnel assistant	1	1,920	23,040
Personnel record clerks	4	1,500	72,000
Social welfare			
Social welfare officer	1	3,176	38,112
Social welfare assistants	2	1,920	46,080
Mess supervisor	1	2,460	29,520
Shops supervisor	1	2,460	29,520
Cooks/attendants mess	5	1,500	90,000
Shop Managers	2	1,920	46,080
Shop attendants	4	1,500	72,000
Teachers	10	1,920	230,400
Helpers	10	1,500	180,000
c/f	262		5,556,296

TABLE VII.5.1 (cont.)

MANNING REQUIREMENTS

	Number proposed	Cost per month/ per man	Cost per year
b/f	262		5,556,296
Cooks, canecutters porridge	3	1,200	43,200
Clerks	3	1,500	54,000
Cleaners/teagirls	4	1,200	57,600
Messengers	2	1,200	28,800
Security			
Security officer	1	3,176	38,112
Security sergeants	3	1,920	69,120
Security corporals	9	1,500	162,000
Security constables	100	1,200	1,440,000
Clerk	1	1,500	18,000
Messenger	1	1,200	14,400
Medical/Health			
Medical officer	1	3,176	38,112
Ass. medical officer	1	2,460	29,520
Medical/health assistants	2	1,920	46,080
Sanitary attendants	10	1,500	180,000
Nurses	15	1,500	270,000
Midwives	15	1,500	270,000
Ward attendants	15	1,500	270,000
Laboratory assistants	3	1,500	54,000
Cooks	3	1,200	43,200
Laundry men	3	1,200	43,200
Clerks	3	1,500	54,000
Typist	1	1,500	18,000
Messengers	2	1,200	28,800
Guesthouse			
Catering officer	1	3,176	38,112
Clerk	1	1,500	18,000
Cooks	2	1,200	28,800
Waiter/attendants	3	1,200	43,200
Laundry men	2	1,200	28,800
Total general	460		8,799,752

TABLE VII.5.2 SUMMARY OF OPERATIONAL COSTS 1984/5 TO 1991/2
(total figures in So.Sh. 1000)

	1984/85		1985/86		1986/87		1987/88		1988/89		1989/90		1990/91		1991/92		1992/93	
Basic data:																		
-Harvestable area (ha)																		
.plantcane	600		800		908		908		908		908		908		908		908	
.ratoons	2,400		3,700		4,076		4,240		4,240		4,240		4,240		4,240		4,240	
.total	3,000		4,500		4,984		5,148		5,148		5,148		5,148		5,148		5,148	
-Production (in tons)																		
.cane	99,000		148,500		214,910		285,470		349,510		405,550		436,650		453,610		469,510	
.sugar	6,040		9,060		14,400		21,120		28,660		36,500		41,920		44,450		46,950	
-Cultivation cost																		
.plantcane per ha	13,138		13,138		18,452		18,452		18,452		18,452		18,452		18,452		18,452	
.ratoons	7,208		7,208		7,884		10,136		11,262		11,262		11,262		11,262		11,262	
-Cost harvesting and cane transport																		
.harvesting per ton cane	33.10		33.10		36.70		35.57		34.64		29.10		26.93		25.16		23.63	
.cane transp.	42.90		42.90		48.10		44.60		41.68		41.68		41.68		41.68		41.68	
	76.00		76.00		84.80		80.17		76.32		70.78		68.61		66.84		65.31	
-Factory cost																		
.proc. consum.(per T.C.)	5.68		5.68		5.68		5.68		5.68		5.68		5.68		5.68		5.68	
.sugar bags (per T.S.)	127.75		127.75		127.75		127.75		127.75		127.75		127.75		127.75		127.75	
	Total	Per ton sugar	Total	Per ton sugar	Total	Per ton sugar	Total	Per ton sugar	Total	Per ton sugar	Total	Per ton sugar	Total	Per ton sugar	Total	Per ton sugar	Total	Per ton sugar
Cost																		
Cultivation plantcane	7,883		10,510		16,754		16,754		16,754		16,754		16,754		16,754		16,754	
Cultivation ratoons	17,299		26,670		32,135		42,975		47,750		47,750		47,750		47,750		47,750	
Cost at field before harvesting	25,182	4,169	37,180	4,104	48,889	3,395	59,729	2,828	64,504	2,251	64,504	1,767	64,504	1,539	64,504	1,451	64,504	1,374
Harvesting and cane transport	7,524	1,246	11,286	1,246	18,224	1,266	22,886	1,083	26,675	931	28,705	786	29,959	714	30,319	682	30,666	653
Roads	1,216	201	1,216	134	1,949	135	2,190	104	2,431	85	2,431	67	2,431	58	2,431	55	2,431	52
Civil engineering	1,980	219	1,980	219	3,160	219	3,555	168	3,951	138	3,951	108	3,951	94	3,951	89	3,951	84
Factory:																		
- Personnel	6,167		6,167		8,810		8,810	417	8,810		8,810		8,810		8,810		8,810	188
- Furnace oil/diesel fuel	10,850		10,850		9,590		7,800	369	5,887		5,887		5,887		5,887		5,887	125
- Lubricants	725		873		1,072		1,284	61	1,476		1,644		1,737		1,789		1,838	39
- Processing consumables	593		845		1,225		1,625	77	1,990		2,305		2,485		2,580		2,668	57
- Sugar bags	771		1,157		1,840		2,698	128	3,661		4,663		5,355		5,678		5,998	128
- Spareparts	10,000		10,000		12,000		14,400	682	14,400		14,400		14,400		14,400		14,400	307
- Transport services	250		250		310		370	17	370		370		370		370		370	8
- Total factory	29,356	4,860	30,142	3,327	34,847	2,420	36,987	1,751	36,594	1,277	38,079	1,043	39,044	931	39,514	889	39,970	851
General*)	9,000	1,490	9,000	993	14,000	972	16,000	758	19,428	678	19,428	532	19,428	464	19,428	437	19,428	414
Cost before depreciation and cost of financing	74,258	12,294	90,804	10,023	121,069	8,407	141,347	6,693	153,583	5,359	157,098	4,304	159,317	3,800	160,147	3,603	160,950	3,428

CHAPTER 6

FINANCIAL PROJECT COSTS

CHAPTER 6

FINANCIAL PROJECT COSTS

The following methodology has been applied :

Base line costs are calculated in mid-1983 constant terms. They are given in DM 1 000 units. Prices are CIF-prices for Jowhar, and they are duty and tax free.

Project costs are defined as the sum of the project's total investment and replacement costs during years 1 to 5 inclusive. Project year 1 starts on 1st July 1984. Project costs do not include for the crash programme (DM 5 million) as described in Annex X nor do they include the cost of a top priority rehabilitation programme which is presently being implemented and which is financed by the Somali Government with the support of US-Commodity Aid (DM 10.6 million). Baseline costs have been increased by physical contingencies of 10% and a provision for inflation of 7% annually starting from project year 1.

Table VII.6.1 summarises capital costs of the project in 1983 constant terms. Costs in year 0 (1983/84) refer to the top priority rehabilitation programme actually under way. The column for year 1 (1984/85) does include investment costs of the crash programme amounting to DM 3.26 million which will not be carried forward to the cost summary nor to the cash flow analysis. Capital costs do include replacement costs of short lived assets such as vehicles.

Costs that have been given in SoSh in source tables have been converted to DM. Figures in quantity columns refer to costs in SoSh.

Vector 1 'Irrigation and Drainage' is taken from Table VII.6.2. Cane production investment is limited to a hot water treatment plant included in the crash programme (year 1) and to minor provisions for tools and measuring instruments.

Vector 3 is identical to the figures of Table V.3.4. It includes rolling stock of all departments. Costs are net of rest value of replaced items.

Vector 4 repeats costs of Table IV.1.1 (year 1984/85), diminished by costs covered within the top priority rehabilitation programme (SoSh 34.162 million) and Table IV.1.2.

Capital costs in the field of irrigation and drainage are summarised in Table VII.6.2.

These do include costs for non-cane areas (SoSh 10.125 million in Year 1 and SoSh 8.805 million in Year 2). These amounts will be maintained in total financial project costs, but they will not be carried forward to the economic analysis.

Pump replacements include costs of replacement for pumps on the Interceptor drain.

Costs for field drains may arise regularly after Year 4, but these have not been included.

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

SUMMARY, CAPITAL COSTS

		UNIT	UNIT COST	0 1983/84		1 1984/85		2 1985/86		3 1986/87		4 1987/88		5 1988/198		sum (1) to(5		6 1989/90		TOTAL	Foreign Exchange		TOTAL SCSL DM = SoS
				quantity	amount	quantity	amount	quantity	amount	quantity	amount	quantity	amount	quantity	amount	quantity	amount	quantity	amount		%	amount	
1	IRRIGATION AND DRAINAGE	DM	.165563	5104	845	1208	200	58181	9633	80086	13259	48757	8072	12513	2568	203745	33733	15510	2568	36300	79	28677	219255
2	CANE PRODUCTION	DM	.165563	0	0	443	60	302	50	0	0	0	0	0	0	745	130	0	0	130	95	123	785
3	TRANSPORT, HARVESTING AND MAINTENANCE	DM	.165563	16772	3108	63433	10502	1661	275	6742	1116	10240	1695	15421	2553	97497	16142	20740	3434	19576	95	18597	118237
3.1	Rolling stock and implements	DM	.165563	12768	2114	60161	9964	1661	275	6742	1116	10240	1695	15421	2553	94245	15603	19669	3256	18860	95	17917	113914
3.2	Railway system	DM	.165563	4004	994	3252	538	0	0	0	0	0	0	0	0	3252	538	1071	177	716	95	680	4323
4	FACTORY	DM	.165563	40402	6689	31710	5250	0	0	10831	1793	20930	3465	5236	867	68709	11376	3124	517	11893	98	10704	71833
5	OVERHEADS	DM	.165563	0	0	7580	1255	302	50	0	0	0	0	0	0	7882	1305	0	0	1305	75	979	7882
5.1	General services	DM	.165563	0	0	302	50	0	0	0	0	0	0	0	0	302	50	0	0	50	75	37	302
5.2	Management unit	DM	.165563	0	0	7278	1205	302	50	0	0	0	0	0	0	7580	1255	0	0	1255	75	941	7580
6	TOTAL	DM	.165563	64278	10642	104414	17287	60446	10008	97659	16169	79927	13233	36172	5989	378618	62685	39374	6519	69204	85	59080	417992

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

DETAILS, IRRIGATION AND DRAINAGE

		UNIT	UNIT COST	0 1983/84 quantity	0 1983/84 amount	1 1984/85 quantity	1 1984/85 amount	2 1985/86 quantity	2 1985/86 amount	3 1986/87 quantity	3 1986/87 amount	4 1987/88 quantity	4 1987/88 amount	5 1988/198 quantity	5 1988/198 amount	SUM (1) to (5) quantity	SUM (1) to (5) amount	6 1989/90 quantity	6 1989/90 amount	TOTAL	Foreign Exchange %	Foreign Exchange amount	TOTAL SoSh 1 DM = 6.04 SoSh
1	Canals and canal structures	DM	.165563	0	0	1208	200	23426	3878	21139	3500	14957	2476	0	0	60730	10055	0	0	10055	75	7541	60730
2	Tertiary canals and in-field works	DM	.165563	0	0	0	0	16950	2811	14618	2420	14615	2420	14618	2420	60831	10071	14615	2420	12491	75	9368	75446
3	Drains and drain structures	DM	.165563	0	0	0	0	14790	2449	41559	2449	16555	2449	0	0	72904	12070	0	0	12070	75	9053	72904
4	Roads	DM	.165563	0	0	0	0	2090	346	1675	310	1735	287	0	0	5700	944	0	0	944	75	708	5700
5	Pump replacements	DM	.165563	0	0	0	0	895	148	895	148	895	148	895	148	3580	593	895	148	741	95	704	4475
6	TOTAL	DM	.165563	0	0	1208	200	58181	9633	80086	8827	48757	7780	15513	2568	203745	33733	15510	2568	36300	79	27374	219255

RSCH 22.04.84

Vector 5.1 in the summary table of capital costs contains office equipment required for the administrative departments. Capital costs of the management unit are composed of :

Item	Unit cost	Quantity	Amount (DM '000)
Vehicles	25	2	50
Rehabilitation and equipment of Estate houses	27	35	945
Office equipment	100	1	100
Office space (m^2)	0.8	200	160
Total			1 205

Recurrent costs are summarised in Table VII.6.3 mainly for the benefit of the financial cash flow analysis presented in Section 5.3 of the main volume.

They are composed of two vectors, namely operational costs and salaries of the management unit. The former have been treated in detail in Chapters 1 to 5 of this annex and they are summarised in Table VII.5.2. The latter are calculated in detail in Table VII.6.4. The underlying principles are presented in Section 4.2.5 'Management staffing' of the main volume.

A detailed estimate of the replacement costs (see Table VII.6.5) is needed mainly for the purpose of financial and economic cash flow analysis. It is presented here in order to avoid an overburdening of the main volume.

For the calculation of the annual replacement of capital assets the following methodology has been applied. The Estate's total assets have been subdivided into two broad categories:

(a) the equipment that has been examined during the rehabilitation programme and for which detailed information is available on costs and remaining lifetime;

(b) the 'previously existing equipment' covering those assets that have not been examined during the rehabilitation programme; for these, less accurate estimates are available for replacement value and remaining lifetime.

Within the category 'newly acquired equipment', major single investment items such as heavy factory equipment have been treated itemwise. Other investment categories, with relatively short standard lifetimes and composed of many small items, such as rolling stock or pumps, have been treated as units to which a constant annual replacement figure has been applied. The value of newly acquired equipment has been estimated to be DM 72.8 million. This is equal to the project's 6 year investment cost. Previously existing equipment including 5 300 ha of irrigated areas has been estimated at DM 185 million.

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

SUMMARY, RECURRENT COST

SER. NR	COST ITEM	YEAR 1984/85 0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Operational cost		12294	15034	20045	23402	25428	26010	26377	26514	26647	26647	26647	26647	26647	26647	26647	26647	26647	26647	26647	2664
2	Management unit		2444	4464	4305	3743	1821	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	Subtotal	0	14738	19498	24350	27145	27249	26010	26377	26514	26647	26647	26647	26647	26647	26647	26647	26647	26647	26647	26647	2664
4	Physical contingencies	0	1474	1950	2435	2714	2725	2601	2638	2651	2665	2665	2665	2665	2665	2665	2665	2665	2665	2665	2665	266
5	TOTAL	0	16212	21448	26784	29859	29974	28611	29015	29166	29312	29312	29312	29312	29312	29312	29312	29312	29312	29312	29312	2931

BSCH 23.04.84

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

DETAILS, MANAGEMENT UNIT

		UNIT COST	0 1983/84 quantity	amount	1 1984/85 quantity	amount	2 1985/86 quantity	amount	3 1986/87 quantity	amount	4 1987/88 quantity	amount	5 1988/89 quantity	amount	sum (1) to (5) quantity	amount	6 1989/90 quantity	amount	TOTAL amount	Foreign Exchange %	amount	TOTAL 1000 SoSh = 1.00 = 6.04 SoSh
1	SUBTOTAL	230.85	n.a.	0	8	1838.25	14	3231.86	14	3231.86	13.5	3100.56	7	1674.221	56.5	13076.76	0	0.00	13076.76	95	12422.92	78993.60
1.01	Factory manager	262.60	n.a.	0	.5	131.30	1	262.60	1	262.60	.5	131.30	0	0.00	3	787.80	0	0.00	787.80	95	748.41	4758.31
1.02	Technical manager	212.60	n.a.	0	.5	106.30	1	212.60	1	212.60	1	212.60	0	0.00	3.5	744.10	0	0.00	744.10	95	706.90	4494.36
1.03	Electrical/Instrum. Engineer	212.60	n.a.	0	.5	106.30	1	212.60	1	212.60	1	212.60	0	0.00	3.5	744.10	0	0.00	744.10	95	706.90	4494.36
1.04	Production Manager	212.60	n.a.	0	.5	106.30	1	212.60	1	212.60	1	212.60	.5	106.30	4	850.40	0	0.00	850.40	95	807.88	5136.42
1.05	Agricultural Manager	262.60	n.a.	0	.5	131.30	1	262.60	1	262.60	1	262.60	1	262.60	4.5	1181.70	0	0.00	1181.70	95	1122.62	7137.47
1.06	Agronomist	212.62	n.a.	0	.5	106.31	1	212.62	1	212.62	1	212.62	1	212.62	4.5	956.80	0	0.00	956.80	95	908.96	5779.05
1.07	Manager mech. agr. operations	212.60	n.a.	0	1	212.60	1	212.60	1	212.60	1	212.60	0	0.00	4	850.40	0	0.00	850.40	95	807.88	5136.42
1.08	Manager irrigation/drainage	232.04	n.a.	0	1	232.04	1	232.04	1	232.04	1	232.04	0	0.00	4	928.16	0	0.00	928.16	95	881.75	5606.09
1.09	Advisor to General Manager and to Personnel Manager	298.60	n.a.	0	.5	149.30	1	298.60	1	298.60	1	298.60	1	298.60	4.5	1343.70	0	0.00	1343.70	95	1276.52	8115.95
1.10	Financial Manager	212.60	n.a.	0	.5	106.30	1	212.60	1	212.60	1	212.60	1	212.60	4.5	956.70	0	0.00	956.70	95	908.87	5778.47
1.11	Training coordinator	212.60	n.a.	0	.5	106.30	1	212.60	1	212.60	1	212.60	0	0.00	3.5	744.10	0	0.00	744.10	95	706.90	4494.36
1.12	F.M.T. Workshop Manager	262.60	n.a.	0	.5	131.30	1	262.60	1	262.60	1	262.60	1	262.60	4.5	1181.70	0	0.00	1181.70	95	1122.62	7137.47
1.13	Ass. F.M.T. Manager	212.60	n.a.	0	.5	106.30	1	212.60	1	212.60	1	212.60	.5	106.30	4	850.40	0	0.00	850.40	95	807.88	5136.42
1.14	Factory Workshop Manager	212.60	n.a.	0	.5	106.30	1	212.60	1	212.60	1	212.60	1	212.60	4.5	956.70	0	0.00	956.70	95	908.87	5778.47
2	SUBTOTAL	46.90	n.a.	0	13	605.50	26.5	1232.35	23	1073.65	13.5	642.60	3	147.00	79	3700.90	0	0.00	3700.90	85	3147.90	22353.44
2.01	Shift engineers	49.00 1)	n.a.	0	1.5	73.50	3	147.00	3	147.00	3	147.00	1.5	73.50	12	588.00	0	0.00	588.00	86	504.00	3551.52
2.02	Mill egineer	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	.5	24.50	0	0.00	3	147.00	0	0.00	147.00	86	126.00	887.58
2.03	Boiler engineer	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	.5	24.50	0	0.00	3	147.00	0	0.00	147.00	86	126.00	887.58
2.04	Electrical engineer	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	.5	24.50	0	0.00	3	147.00	0	0.00	147.00	86	126.00	887.58
2.05	Instrument engineer	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	.5	24.50	0	0.00	3	147.00	0	0.00	147.00	86	126.00	887.58
2.06	Repair engineers	42.70	n.a.	0	1.5	64.05	3	128.10	1.5	64.05	0	0.00	0	0.00	6	256.20	0	0.00	256.20	86	214.20	1546.45
2.07	Design technician	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	1	49.00	.5	24.50	4	196.00	0	0.00	196.00	86	168.00	1183.37
2.08	Shift process supervisors	42.70	n.a.	0	1.5	64.05	3	128.10	3	128.10	1.5	64.05	0	0.00	9	384.30	0	0.00	384.30	86	321.30	2321.17
2.09	Laboratory chemist	49.00	n.a.	0	.5	24.50	1	49.00	.5	24.50	0	0.00	0	0.00	2	98.00	0	0.00	98.00	86	84.00	591.97
2.10	Manager harvest/transport	49.00	n.a. 0	0	.5	24.50	1	49.00	1	49.00	0	0.00	0	0.00	3.5	171.50	0	0.00	171.50	86	147.00	1035.93
2.11	Manager farms	49.00	n.a.	0	.5	24.50	1	49.00	.5	24.50	0	0.00	0	0.00	2	98.00	0	0.00	98.00	86	84.00	591.97
2.12	Assistant Agronomist	49.00	n.a.	0	.5	24.50	1	49.00	.5	24.50	0	0.00	0	0.00	2	98.00	0	0.00	98.00	86	84.00	591.97
2.13	Distribution Controller (irr.)	42.70	n.a.	0	0	0.00	.5	21.35	1	42.70	.5	21.35	0	0.00	2	85.40	0	0.00	85.40	84	71.40	515.63
2.14	Maintenance Technician (irr.)	42.70	n.a.	0	.5	21.35	1	42.70	.5	21.35	0	0.00	0	0.00	2	85.40	0	0.00	85.40	84	71.40	515.63
2.15	Surveyor	42.70	n.a.	0	.5	21.35	1	42.70	.5	21.35	0	0.00	0	0.00	2	85.40	0	0.00	85.40	84	71.40	515.63
2.16	Heavy plant/wheeltractor eng.	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	.5	24.50	0	0.00	3	147.00	0	0.00	147.00	86	126.00	887.58
2.17	Motorvehicle engineer	42.78	n.a.	0	.5	21.35	1	42.70	1	42.70	.5	21.35	0	0.00	3	128.10	0	0.00	128.10	84	107.10	773.74
2.18	General engineer	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	1	49.00	.5	24.50	4	196.00	0	0.00	196.00	86	168.00	1183.44
2.19	Machineshop supervisor	42.70	n.a.	0	.5	21.35	1	42.70	1	42.70	.5	21.35	0	0.00	3	128.10	0	0.00	128.10	84	107.10	773.74
2.20	Stores manager	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	1	49.00	.5	24.50	4	196.00	0	0.00	196.00	86	168.00	1183.44
2.21	Budget/cost accountant	49.00	n.a.	0	.5	24.50	1	49.00	1	49.00	1	49.00	0	0.00	3.5	171.50	0	0.00	171.50	86	147.00	1035.93
3	GRAND TOTAL		138.87	0.00	21	2443.75	40.5	4464.21	37	4305.31	27.00	3743.16	10.00	1821.22	135.50	16777.66	0.00	0.00	16777.66		15570.82	101337.60

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

REPLACEMENT VALUE, YEARS 7 TO 30

Ser. Nr.		Standard Lifetime (years)	Replace value (1000DM)	7 1990/91	8 1991/92	9 1992/93	10 1993/94	11 1994/95	12 1995/96	13 1996/97	14 1997/98	15 1998/99	16 1999/00	17 2000/01	18 2001/02	19 2002/03	20 2003/04	21 2004/05	22 2005/06	23 2006/07	24 2007/08	25 2008/09	26 2009/10	27 2010/11	28 2011/12	29 2012/13	30 2013/14
1	NEWLY ACQUIRED EQUIPMENT		72400	1250	1250	9250	3250	3250	9750	3250	3250	4150	4150	9900	4150	4150	4150	4150	16850	4150	4150	4150	4150	10150	4150	4150	42050
1.1	Irrigation		35300	150	150	150	150	150	150	150	150	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	25400
1.1.1	pumps	5	750	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	400
1.1.2	mechanical engineering concrete works	20	7250	0	0	0	0	0	0	0	0	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	5000
1.1.3	earthworks	50	27290	0	0	0	0	0	0	0	0	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	20000
1.2	Transport, Harvesting, Cane Production		18000	1100	1100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	6600
1.2.1	roads	50	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
1.2.2	rails	30	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500
1.2.3	rolling stock	5	15000	1000	1000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	5000
1.2.4	workshop equipment	10	1000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1.3	Factory		18250	0	0	6000	0	0	6500	0	0	0	0	5250	0	0	0	0	12500	0	0	0	0	4000	0	0	9700
1.3.1	mill	20	3000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3000	0	0	0	0	0	0	0	1500
1.3.2	boilers	20	3000	0	0	6000	0	0	0	0	0	0	0	0	0	0	0	0	3000	0	0	0	0	6500	0	0	3000
1.3.3	generators	10	4000	0	0	0	0	0	4000	0	0	0	0	0	0	0	0	0	4000	0	0	0	0	0	0	0	1000
1.3.4	alcohol plant	10	500	0	0	0	0	0	500	0	0	0	0	0	0	0	0	0	500	0	0	0	0	0	0	0	200
1.3.5	other electrical equipment	15	1000	0	0	0	0	0	0	0	0	0	0	1000	0	0	0	0	0	0	0	0	0	0	0	0	0
1.3.6	other equipment	15	4750	0	0	0	0	0	0	0	0	0	0	4750	0	0	0	0	0	0	0	0	0	0	0	0	0
1.4	Buildings		1250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300
1.4.1	staff housing	50	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300
1.4.2	factory	30	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	PREVIOUSLY EXISTING EQUIPMENT		232050	1550	2350	3050	4150	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	5332	154000
2.1	Irrigated Area	50	170000	1000	1500	1500	2400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	150000
2.2	Transport, Harvesting, Cane Production		7000	0	0	0	0	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	4000
2.2.1	roads	50	2000	0	0	0	0	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	1500
2.2.2	rails	30	5000	0	0	0	0	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	2500
2.3	Factory	30	50000	500	800	1200	1500	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	0
2.4	Buildings	50	5000	50	50	50	50	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0
3	Annual TOTAL			2800	3600	12300	7400	8632	15132	8632	8632	9532	9532	15282	9532	9532	9532	9532	22032	9532	9532	9532	9532	15532	9532	9532	196050

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Based on these assumptions the long term standard replacement costs per annum amount to DM 9.5 million. This figure is required for the first time in Year 15 after rising steadily from the lowest level of replacement costs in project Year 7 immediately after implementation of the rehabilitation programme. Exceptional years in the series of replacement costs are those where major mechanical components have to be replaced namely Year 12, Year 17 and Year 22. In the latter the major equipment components of the factory will have to be replaced. DM 6.0 million for boiler replacement in Year 9 refers to the replacement of the 40 t Pensotti boiler.

Total financial project cost as presented in Table VII.6.6 amounts to DM 93.674 million out of which DM 59.191 milllion are investment costs in 1983 constant terms, whereas DM 16.777 million cover the foreign exchange component for the salaries of the management unit. Another DM 17.706 million cover the contingencies of the 5 year programme.

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

SUMMARY, FINANCIAL PROJECT COSTS

FIN COSTSUM

		UNIT	UNIT COS	0 1983/84 quantity	0 1983/84 amount	1 1984/85 quantity	1 1984/85 amount	2 1985/86 quantity	2 1985/86 amount	3 1986/87 quantity	3 1986/87 amount	4 1987/88 quantity	4 1987/88 amount	5 1988/89 quantity	5 1988/89 amount	SUM cols.(1) to (5) quantity	SUM cols.(1) to (5) amount	FOREIGN EXCHANGE %	FOREIGN EXCHANGE amount
1	CAPITAL COSTS	DM	1	-	-	14027	14027	9783	9783	16169	16169	13223	13223	5989	5989	59191	59191	86	50904
2	MANAGEMENT UNIT	DM	1	-	-	2444	2444	4464	4464	4305	4305	3743	3743	1821	1821	16777	16777	95	15938
3	SUBTOTAL (Baseline cost)	DM	1		0	16471	16471	14247	14247	20474	20474	16966	16966	7810	7810	75968	75968	88	66842
4	CONTINGENCIES			0	0	1647	1647	2422	2422	4914	4914	5515	5515	3208	3208	17706	17706	88	15550
4.1	Physical	DM	10%	0	0	1647	1647	1425	1425	2047	2047	1697	1697	781	781	7597	7597	88	6684
4.2	Inflation	DM	1	0	0	0	0	997	997	2866	2866	3818	3818	2427	2427	10109	10109	88	8894
5	TOTAL	DM	1		0	18118	18118	16669	16669	25388	25388	22481	22481	11018	11018	93674	93674	88	82423

RSCH 24.04.84

ANNEX VIII

ECONOMIC ANALYSIS

ANNEX VIII

ECONOMIC ANALYSIS

CONTENTS

LIST OF TABLES

CHAPTER 1

MARKETS AND PRICES

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

Price Structures (SoSh 1983)

Serial Nr	Item	Unit	Import parity price estimates	Producer price	Official consumer price	Price Jowhar	Price Mogadishu
1	**Production means**						
1.1	Seed(1)	kg		8			
1.11	Maize	kg		12.5			
1.12	Beans	kg		9 000			
1.13	Paddy	1 000 kg		na			
1.14	Cocoa seedlings	unit		na			
1.15	Cane cuttings	1 000 kg					
1.2	Fertiliser	kg					
1.21	Urea	kg	2.36			2.7	2.59
1.22	Triplesuper-phosphate	kg	3.11				
1.23	Diamoniumphosphate	kg	3.75				
1.24	Muriate of potash (potassium chloride)	kg	2.17				
1.25	Phosphate rock	kg	1.62				
1.26	Gypsum	kg	na				
1.27	Potassium sulphate	kg					3.96
1.28	15/15/15 or 15/7/24	kg					3.5

Note : (1) 125% of average producer price.

Table Nr VIII.1.1
(cont.)

Serial Nr	Item	Unit	Import parity price estimates	Producer price	Official consumer price	Price Jowhar	Price Mogadishu
2	**Agricultural Products**						
2.01	Sugar (factory white)	1 000 kg	6 084	6 018 (+ 3 000)	14 350	20 000/28 000	22 000/40 000
2.02	Maize, white (couscous)	kg	2.98	1.8	5	5-8	5-14
2.03	Rice, 5% broken	kg	5.56			16-18	18
2.04	Cow peas (salbaco)	kg				18	18
2.05	Mung beans (red, small)	kg				10	10-15
2.06	String beans	kg					30
2.07	Coconuts	-					
2.07.1	Fresh coconut for consumption	unit	-	-	-	2.5-5.0	2.5-5.0
2.07.2	Copra	1000 kg	6 600	-	-	-	-
2.08	Grapefruit	unit		-		4-5	4-7
2.09	Beef, fresh, boneless	kg	4		25	40	40
2.10	Sesame						22
2.10.1	Grain	kg		9			
2.10.2	Oil	litre	8			55	55-60
2.11	Charcoal	1 bag/50 kg		55	75	90	150
3.1	Fuel oil	litre				4.70	
3.2	Diesel	litre				6.67	
3.3	Petrol	litre				10.65	
3.4	Electricity	kWh		0.60(2.80)(1)			

Table Nr VIII.1.1
(cont.)

Table Nr VIII.1.1 (cont.)

Serial Nr	Item	Unit	Import parity price estimates	Producer price	Official consumer price	Price Jowhar	Price Mogadishu
4	**By-Products**						
4.1	Bagasse						
4.2	Molasses						
4.3	Alcohol, drinking	100 l		375(2)			
4.4	Alcohol, industry	100 l		225(2)			
5	**Transport**						
5.1	Good road, 25 t lorry	t km				1.37	
5.2	Bush-taxi	t km				3.50	
5.3	Evacuation on bad road	t km				4.20	

Notes : (1) After 1.01.83.
(2) Transfer price to BIASA SoSh 90 and 60 respectively, and SoSh 300 and 200/100 l after 1.04.83.

Table Nr VIII 1.1 (cont.)

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

FINAL REPORT

SUGAR PRICES

Sugar - Prices

		1964 1	1965 2	1966 3	1967 4	1968 5	1969 6	1970 7	1971 8	1972 9	1973 10	1974 11	1975 12	1976 13	1977 14	1978 15	1979 16	1980 17	1981 18	1982 19	1983 20
1	Retail, Mogadishu (SoSh/kg)	2.80	2.50	2.40	2.40	2.40	2.40	2.40	2.40	2.43	2.63	3.64	4.60	4.60	4.60	6.00	6.00	n.a.	n.a.	n.a.	25.00
2	Wholesale, Mogadishu (SoSh/kg)	2.71	2.35	2.25	2.25	2.25	2.26	2.26	2.26	2.29	2.51	3.47	4.40	4.40	4.40	5.00	5.00	n.a.	n.a.	11.80	18.00
3	Sugar price index (consumer) (1977 = 100 %)	61.00	54.00	52.00	52.00	52.00	52.00	52.00	52.00	53.00	57.00	79.00	100.00	100.00	100.00	130.00	130.00	n.a.	n.a.	256.00	391.00
4	Import prices (SoSh/kg)												2.83	1.61	1.13	1.08	1.34	3.98	2.35	2.89	3.00
5	Living cost index, Mogadishu (1977 = 100 %)	46.00	52.00	50.00	50.00	51.00	54.00	54.00	54.00	53.00	56.00	66.00	79.20	90.59	100.00	10.00	156.00	263.00	316.00	n.a.	n.a.

Sources: Statistical abstract and
Annual report of Central Bank of Somalia

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SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

FINAL REPORT

Review of per Capita Consumption

Sugar	Consumption	1964 1	1965 2	1966 3	1967 4	1968 5	1969 6	1970 7	1971 8	1972 9	1973 10	1974 11	1975 12	1976 13	1977 14	1978 15	1979 16	1980 17
1	Consumers (x1000)	3501.25	3609.53	3721.17	3836.25	3954.90	4077.22	4203.32	4333.32	4467.34	4605.50	4747.94	4894.78	5046.17	5202.24	6063.13	6229.00	6400.00
1.1	Somalis 1.)	3071.27	3166.26	3264.18	3365.14	3469.21	3576.51	3687.12	3801.16	3918.72	4039.91	4164.86	4293.67	4426.46	4563.37	4704.50	4850.00	5000.00
1.2	Border area outside Somalia 1.)	429.98	443.28	456.99	471.12	485.69	500.71	516.20	532.16	548.62	565.59	583.08	601.11	619.70	638.87	658.63	679.00	700.00
1.3	Refugees	—	—	—	—	—	—	—	—	—	—	—	—	—	—	700.00	700.00	700.00
2	Offer (tx1000)	n.a.	21.59	28.60	35.27	39.55	42.35	44.26	52.52	47.48	46.57	35.81	37.26	27.57	47.80	39.31	42.68	n.a.
2.1	national production	8.80	16.20	24.60	32.40	28.10	39.90	44.20	47.50	42.30	37.40	31.40	33.00	27.20	36.20	27.20	27.40	23.00
2.2	imports (3 year gliding average)	n.a.	5.39	4.00	2.87	2.45	2.45	0.06	5.02	5.18	9.17	4.41	4.26	0.37	11.60	12.11	15.28	n.a.
3	Per capita consumption (kg)		5.98	7.69	9.19	7.73	10.39	10.53	12.12	10.63	10.11	7.54	7.61	5.46	9.19	6.48	6.85	

1.) growth rate 3 %

RSCH 24.11.83

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

FINAL REPORT

SUGAR IMPORTS

sugar imports		UNIT	1964 1	1965 2	1966 3	1967 4	1968 5	1969 6	1970 7	1971 8	1972 9	1973 10	1974 11	1975 12	1976 13	1977 14	1978 15	1979 16	1980 17
1	REFINED SUGAR																		
1.1	Quantity	tx1000	4.24	3.35	8.53	9.07	7.20	0.09	0.04	0.03	14.97	0.03	0.01	0.71	0.07	0.32	34.15	1.61	9.27
1.2	Value	SoSh x 100	7.62	2.52	8.53	0.09	5.46	0.10	0.05	0.05	20.19	0.13	0.03	3.73	0.25	0.89	76.13	10.24	28.13
1.3	Unit price	SoSh / t	1798.68	746.00	1000.23	1357.69	758.02	1078.65	1394.74	1542.59	1348.74	3911.76	5600.00	5217.09	3472.22	2834.92	2229.43	6353.60	3034.48
2	SUGAR, NOT REFINED																		
2.1	Quantity	tx1000	0.00	0.03	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.50	11.99	0.00	0.01	0.01	0.25	0.00	0.06
2.2	Value	SoSh x 100	0.00	0.05	0.01	0.01	0.00	0.00	0.01	0.02	0.00	1.65	69.72	0.00	0.02	0.02	1.08	0.00	n. a.
2.3	Unit price	SoSh / t	0.00	1960.00	1285.71	816.33	0.00	1000.00	1000.00	1769.23	0.00	3290.00	5864.98	3000.00	3000.00	3500.00	4297.62	1500.00	0.00
3	COUNTRY TOTAL																		
3.1	Quantity	tx1000	4.24	3.40	8.53	9.07	7.20	0.09	0.05	0.05	14.97	0.53	11.99	0.72	0.08	0.32	34.40	1.61	9.32
3.2	Value	SoSh x 100	7.62	2.57	8.54	0.09	5.46	0.10	0.07	0.07	20.19	1.78	69.75	3.73	0.27	0.91	77.21	10.25	28.13
3.3	Unit price	SoSh / t	0.00	754.92	1000.47	1243.32	0.00	1077.78	1300.00	1422.22	0.00	3329.59	5865.20	5213.99	3425.00	2847.35	2244.56	6347.58	3017.82
4	3-YEAR SLIDING AVERAGE OF (3.1) t x 1000			5.39	4.00	5.27	2.45	2.45	0.04	5.02	5.18	9.17	4.41	4.26	0.37	11.69	12.11	15.11	n.a.

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

Export Parity Prices for Sugar (raw)
(Constant 1983 Prices)

Serial Nr		Unit	Economic prices(1) Trend price 1983	Economic prices(1) Projection 1995	Financial prices Trend price 1983	Financial prices Projection 1995
1	FOB Carribean port	US$/t	333.0	333.0	333.0	333.0
	Plus reduced ocean(2) freight to markets (Europe, arab. penins.)	US$/t	20.0	20.0	20.0	20.0
2.1	CIF Mogadishu	US$/t	353.0	353.0	353.0	353.0
2.2	FOB Mogadishu	SoSh/t	7 060.0	7 060.0	5 375.0	5 375.0
3	Less handling and(3) transport	SoSh/t	150.0	200.0	150.0	200.0
4	Factory gate price for sugar	SoSh/t	6 910.0	6 910.0	5 225.0	5 175.0
5	Estimated value of(4) sugar cane, free factory	SoSh/t	345.0	345.0	261.0	259.0

Notes : (1) At the shadow exchange rate of US $ 1 = 20 SoSh
(2) At the official exchange rate of US $ 1 = 15.22 SoSh
(3) Mission estimates
(4) Estimated at 5% of sugar value

INSTRUPA - MACDONALD - HVA **Table Nr VIII.1.6**

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

Import Parity Prices for Sugar (raw)
(Constant 1983 Prices)

Serial Nr		Unit	Economic prices(1) Trend price 1983	Economic prices(1) Projection 1995	Financial prices Trend price 1983	Financial prices Projection 1995
1	FOB Caribbean port	US$/t	333	333	333	333
	plus ocean freight	US$/t	60	60	60	60
2.1	CIF Mogadishu	US$/t	393	393	393	393
2.2	FOB Mogadishu	SoSh/t	7 860	7 860	5 984	5 984
3	Plus handling and transport(3)	SoSh/t	100	140	100	140
4	Free ENC godown	SoSh/t	7 960	8 000	6 084.21	6 124

Note : (1) At the shadow exchange rate of US$ 1 = SoSh 20.

(2) At the official exchange rate of US$ 1 = SoSh 15 227.

(3) Mission estimates.

CHAPTER 2

ECONOMIC COSTS

CHAPTER 2

ECONOMIC COSTS

The following alterations have been applied to the financial project cost as calculated in Annex VII, Section 6:

- As the foreign exchange component of project costs amounts to 88% and, as furthermore, all costs for imported materials are based on duty free prices, financial costs have been transformed to economic costs by applying a conversion factor of 1.

- Baseline costs of Annex VII have been increased by 10% to cover physical contingencies. Within the vector capital costs, irrigation and drainage, items attributable to non-cane areas have been excluded. They amount to SoSh 10 125 000 (DM 1.676 million) in project year 2 and to SoSh 8 805 000 (DM 1.458 million) in project year 3.

The term capital expenditure refers to investments and replacement costs. Details of replacement costs are calculated in Table VII.6.5. Recurrent expenditure includes operational costs as summarised in Annex VII, Section 5 and salaries of the management unit.

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

Standard Rules for Financial Calculations

		Past $y_{-6} - y_{-1}$	1983 y_0	Future $y_1 - y_{20}$
1.	**Rate of Inflation**			
1.1	Somalia (1977 to 1983, (SoSh) - consumer price index Mogadishu - import	55% per year (100 to 400) 100 363		30% per year
1.2	International	7% per year		7% per year
1.3	Conversion factors, imported goods in SoSh - DM 1983			

SoSh (imported goods)	DM 1983
1976	3.83 x 6.04 = 23.28
1977	3.63 x 6.04 = 21.93
1978	3.39 x 6.04 = 20.48
1979	3.17 x 6.04 = 19.15
1980	2.96 x 6.04 = 17.88
1981 counter I	2.77 x 6.04 = 16.73
1981 counter II	1.38 x 6.04 = 8.34
1982	1.29 x 6.04 = 7.79
1983	1.00 x 6.04 = 6.04

CHAPTER 3

COST BENEFIT ANALYSIS

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

CASHFLOW AND SENSITIVITY TEST

	Ser.Nr.		UNIT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
5300 ha	1	CAPITAL EXPENDITURE	100/a	14016	9333	14328	14556	4528	7171	3080	3940	13530	8140	9495	16645	9495	9495	10485
	2	INCREMENTAL RECURRENT EXP.	100/a	6256	11994	17311	20584	20520	19157	18281	17212	18858	18858	19458	19158	19458	19458	19458
	3	INCREMENTAL SUGAR PRODUCTION	100/a	3515	4468	11785	10558	20169	34044	39466	42044	44572	44572	44572	44572	44572	44572	44572
	4	CASHFLOW. ANNUAL	100/a	-17410	-14921	-21874	-16408	-959	7718	16865	18392	11184	16574	15219	8069	15219	15219	14229
	5	CUMULATED	100	-17410	-32331	-54205	-70613	-71572	-63854	-46989	-28597	-17413	-839	14380	22449	37668	52887	67116
5390 ha	1	CAPITAL EXPENDITURE	100/a	16118	11198	19576	17467	7906	8685	3696	4752	16736	9748	11396	18974	11396	11396	12582
	2	INCREMENTAL RECURRENT EXP.	100/a	8110	14393	29707	24567	24625	22758	23472	23454	23530	23130	23130	23130	23130	23130	23130
	3	INCREMENTAL SUGAR PRODUCTION	100/a	2491	5125	9620	14463	20919	27237	31404	33451	35150	35650	35650	35650	35650	35650	35650
120/80	4	CASHFLOW. ANNUAL	100/a	-22238	-20467	-30963	-27111	-11610	-4357	4435	5245	-4408	2060	434	-8644	434	434	-754
	5	CUMULATED	100	-22238	-42705	-73668	-100779	-112389	-116746	-112311	-107066	-111474	-109414	-108980	-117624	-116692	-116259	-117013
5300 ha	1	CAPITAL EXPENDITURE	100/a	11213	7466	13063	11645	5270	5737	2464	3148	10134	4512	7596	13316	7596	7596	6318
	2	INCREMENTAL RECURRENT EXP.	100/a	5696	9595	13065	14325	14916	15226	15449	15720	15616	15616	15616	15616	15616	15616	15616
	3	INCREMENTAL SUGAR PRODUCTION	100/a	1657	3467	14112	22265	31371	40855	47407	50477	53487	53487	53487	53487	53487	53487	53487
80/120	4	CASHFLOW. ANNUAL	100/a	-12583	-9374	-12785	-5705	9692	19793	29294	31539	28574	29290	30004	24284	30004	30004	29212
	5	CUMULATED	100	-12583	-21957	-34742	-40447	-30756	-10962	18332	49872	78446	107736	137740	162024	192028	222032	251244
5390 ha	1	CAPITAL EXPENDITURE	100/a	16591	11047	19328	17710	7758	8464	3456	4467	16015	9835	11239	19703	11239	11239	12411
	2	INCREMENTAL RECURRENT EXP.	100/a	7990	14197	20515	24155	24298	22474	23154	23333	23506	23506	23506	23594	23506	23506	23506
	3	INCREMENTAL SUGAR PRODUCTION	100/a	4474	6520	15674	26677	34778	45268	52542	55945	59281	59281	59281	59281	59281	59281	59281
.39(1.3) /(.3)	4	CASHFLOW. ANNUAL	100/a	-20116	-16724	-24168	-16708	2690	14117	25742	27925	19760	26140	24536	16072	24536	24536	23364
	5	CUMULATED	100	-20116	-36840	-61008	-77717	-75026	-60909	-35167	-7243	12517	38657	63192	79263	103799	128335	151699

	Ser.Nr.		UNIT	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	IRR
5300 ha	1	CAPITAL EXPENDITURE	100/a	10485	16610	10505	10485	10485	10485	24235	10435	10485	10485	10485	17085	10485	10585	10485	
	2	INCREMENTAL RECURRENT EXP.	100/a	19458	19458	19458	19458	19458	19458	19458	19458	19458	19458	19458	19458	19458	19458	19458	
	3	INCREMENTAL SUGAR PRODUCTION	100/a	44572	44572	44572	44572	44572	44572	44572	44572	44572	44572	44572	44572	44572	44572	240652	
	4	CASHFLOW. ANNUAL	100/a	14229	7904	14229	14229	14229	14229	479	14229	14229	14229	14229	7629	14229	14229	210309	17.4
	5	CUMULATED	100	81345	89249	103477	117706	131935	146164	146643	160872	175101	189330	203559	211188	225417	239646	449955	
5390 ha	1	CAPITAL EXPENDITURE	100/a	12582	20172	12582	12582	12582	12582	29092	12582	12582	12582	12582	20582	12582	12582	12582	
	2	INCREMENTAL RECURRENT EXP.	100/a	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	23130	
	3	INCREMENTAL SUGAR PRODUCTION	100/a	35650	35650	35650	35650	35650	35650	35650	35650	35650	35650	35650	35650	35650	35650	192522	
120/80	4	CASHFLOW. ANNUAL	100/a	-754	-8344	-754	-754	-754	-754	-17254	-754	-754	-754	-754	-3674	-754	-754	154118	neg.
	5	CUMULATED	100	-117767	-126111	-126865	-127619	-128373	-129127	-146381	-147136	-147890	-148644	-149398	-153072	-153826	-154580	-462	
5300 ha	1	CAPITAL EXPENDITURE	100/a	6318	13448	6318	6318	6318	6318	10318	6318	6318	6318	6318	13448	6318	6318	6318	
	2	INCREMENTAL RECURRENT EXP.	100/a	15616	15616	15616	15616	15616	15616	15616	15616	15616	15616	15616	15616	15616	15616	15616	
	3	INCREMENTAL SUGAR PRODUCTION	100/a	53487	53487	53487	53487	53487	53487	53487	53487	53487	53487	53487	53487	53487	53487	218713	
80/120	4	CASHFLOW. ANNUAL	100/a	29212	24152	29212	29212	29212	29212	10212	29212	29212	29212	29212	23932	29212	29212	284588	
	5	CUMULATED	100	280456	304608	333820	363032	392244	421456	431668	460880	490092	519304	548516	572448	601660	630872	903310	
5390 ha	1	CAPITAL EXPENDITURE	100/a	12411	19894	12411	12411	12411	12411	28407	12411	12411	12411	12411	20226	12411	12411	12411	
	2	INCREMENTAL RECURRENT EXP.	100/a	23506	23506	23506	23506	23506	23506	23506	23506	23506	23506	23506	23506	23506	23506	23506	
	3	INCREMENTAL SUGAR PRODUCTION	100/a	59281	59281	59281	59281	59281	59281	59281	59281	59281	59281	59281	59281	59281	59281	320867	
.39(1.3) /(.3)	4	CASHFLOW. ANNUAL	100/a	23364	15877	23364	23364	23364	23364	7088	23364	23364	23364	23364	15551	23364	23364	284150	
	5	CUMULATED	100	175063	190940	214303	237667	261031	284394	291482	314846	338210	361573	384937	400488	423852	447216	731366	

Direct value assets
110 000

DSCH 23.06.86

3–1

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

DETAILS, CASHFLOW YEARS 1 TO 6

FIN	cashflow	MY1-5																
		UNIT	UNIT COS	0 1983/84 quantity	amount	1 1984/85 quantity	amount	2 1985/86 quantity	amount	3 1986/87 quantity	amount	4 1987/88 quantity	amount	5 1988/89 quantity	amount	SUM cols.(1) quantity	amount	to(5) quantity	amount	6 1989/90 quantity	amount
1	CAPITAL EXPENDITURE	DM	1.1		10642	12742	14016	8485	9333	14844	16328	13233	14556	5989	6588		60821	6519	7171
2	RECURRENT EXPENDITURE	DM	1.1		9454	14738	16212	19498	21448	24350	26785	27145	29860	27249	29974		124378	26010	28611
3	INCR. RECURRENT	DM	1		0		6758		11994		17331		20406		20520		77010		19157
4	TOTAL NEGATIVE CASHFLOW	DM	1		10642		20774		21327		33659		34962		27108		137831		26328
5	INCR. SUGAR PRODUCTIO	DM/t	1.00728	2700	2720	6040	3364	9060	6406	14400	11785	21120	18554	28660	26149		66259	36500	34046
6	ANNUAL CASHFLOW	DM	1		-7922	6040	-17410	9060	-14921	14400	-21874	21120	-16408	28660	-959	0	-71572	36500	7718
7	CUMULATED	DM	1		-7922		-25332		-40253		-62127		-78535		-79494				-71777

RSCH 23.04.84

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

ESTIMATE OF REPLACEMENT COSTS

Ser. Nr.		Standard Lifetime value (years)	Replace value (1000DA)	1990/91 (7)	1991/92 (8)	1992/93 (9)	1993/94 (10)	1994/95 (11)	1995/96 (12)	1996/97 (13)	1997/98 (14)	1998/99 (15)	1999/00 (16)	2000/01 (17)	2001/02 (18)	2002/03 (19)	2003/04 (20)	2004/05 (21)	2005/06 (22)	2006/07 (23)	2007/08 (24)	2008/09 (25)	2009/10 (26)	2010/11 (27)	2011/12 (28)	2012/13 (29)	2013/14 (30)
1	PREVLY ACQUIRED EQUIPMENT		72100	1250	1250	9250	3250	3250	9750	3250	3250	4150	4150	9700	4150	4150	4150	4150	16650	4150	4150	4150	4150	10150	4150	4150	42950
1.1	Irrigation		35300	150	150	150	150	150	150	150	150	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	25400
1.1.1	pumps	5	750	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	450
1.1.2	mechanical engineering concrete works	20	7250	0	0	0	0	0	0	0	0	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	5000
1.1.3	earthworks	50	27290	0	0	0	0	0	0	0	0	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	20000
1.2	Transport, Harvesting, Cane Production		18000	1100	1100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	3100	6450
1.2.1	roads	50	1080	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	580
1.2.2	rails	30	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	360
1.2.3	rolling stock	5	15000	1000	1000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	5000
1.2.4	workshop equipment	10	1000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	510
1.3	Factory		18250	0	0	6000	0	0	6500	0	0	0	0	5250	0	0	0	0	12500	0	0	0	0	6000	0	0	9700
1.3.1	mill	20	3000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3000	0	0	0	0	0	0	0	1500
1.3.2	boilers	20	3000	0	0	6000	0	0	0	0	0	0	0	0	0	0	0	0	3000	0	0	0	0	6000	0	0	1000
1.3.3	generators	10	6000	0	0	0	0	0	6000	0	0	0	0	0	0	0	0	0	6000	0	0	0	0	0	0	0	3000
1.3.4	alcohol plant	10	500	0	0	0	0	0	500	0	0	0	0	0	0	0	0	0	500	0	0	0	0	0	0	0	200
1.3.5	other electrical equipment	15	1000	0	0	0	0	0	0	0	0	0	0	1000	0	0	0	0	0	0	0	0	0	0	0	0	0
1.3.6	other equipment	15	4750	0	0	0	0	0	0	0	0	0	0	4750	0	0	0	0	0	0	0	0	0	0	0	0	0
1.4	Buildings		1250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	310
1.4.1	staff housing	50	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300
1.4.2	factory	30	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
2	PREVIOUSLY EXISTING EQUIPMENT		232090	1550	2350	3050	4150	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	5382	154809
2.1	Irrigated Area	50	170900	1800	1550	1800	2400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	3400	150000
2.2	Transport, Harvesting, Cane Production		7000	0	0	0	0	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	215	4000
2.2.1	roads	50	2000	0	0	0	0	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	1500
2.2.2	rails	30	5000	0	0	0	0	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	3500
2.3	Factory	30	50000	500	800	1200	1500	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	0
2.4	Buildings	50	5000	50	50	50	50	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0
3	A Annual TOTAL			2600	3600	12300	7400	8632	15132	8632	8632	9532	9532	15282	9532	9532	9532	9532	22032	9532	9532	9532	9532	15532	9532	9532	196800

ESCH 23.04.84

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

Final Report

Results Cost-Benefit Analysis
('000 DM, economic, 1983 constant terms)

Serial Nr		IRR (%)	Maximum negative cash flow	First year of positive cash flow	'Standard' cash flow at full production
1	Basic solution	17.6	71 572	6	11 855
2	Cost 120%/Benefits 80%	neg.	159 580	7	-2 600
3	Cost 80%/Benefits 120%	32.9	46 447	5	26 375
4	Foreign exchange components shadow priced (1 US$ = 20 SoSh instead of 15) Cost: 0.89 x 1.33 Benefit: 1.00 x 1.33	18.2	77 717	5	20 210

Table VIII.3.4

ANNEX IX

MANAGEMENT UNIT

ANNEX IX

MANAGEMENT UNIT

CONTENTS

CONTENTS (cont.)

LIST OF TABLES

CHAPTER 1

FACTORY

1.1 Factory Manager

Department:

Factory.

General Description:

The Factory Manager will plan, programme and coordinate the total operation and maintenance of the sugar factory to ensure a regular cane supply and optimum economical production of sugar at a minimum downtime.

Reports to:

General Manager.

Duties and Responsibilities:

- Delegate tasks and authority to his subordinate supervisory staff as required for the effective execution of all mechanical, electrical and processing activities.
- Analyse reasons for factory downtime and issue instructions for achieving minimum downtime.
- Relate production results to plant and equipment efficiencies and implement modifications and improvements if required.
- Collect in time from his higher factory management staff all data for preparing the annual budget and to have ordered consumables, spare parts and all other relevant material for maintaining the required stock level.
- Arrange that his subordinate staff on all levels is adequately trained, theoretically as well as practically on the job.
- Assess annually in consultation with the higher factory management staff the professional conduct of all factory personnel for remuneration and promotion purposes.
- Arrange that all industrial safety regulations are strictly adhered to.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in Mechanical, Electrical or Chemical Engineering.
- Minimum of 10 years' experience in a cane sugar factory, of which at least 3 years in the position of Factory Manager.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 35 years.

1.2 Technical Manager

Department:

Factory.

General Description:

The Technical Manager will have the overall direction and supervision of the maintenance and mechanical/electrical operation of all machinery and equipment, directly related to the production of sugar.

Reports to:

Factory Manager.

Duties and Responsibilities:

- Delegate to his subordinate staff the tasks required for achieving an effective continuous factory operation and adequate maintenance in concert with the Production Manager.
- Arrange the provision of spare parts, materials and tools essential for proper maintenance and efficient factory operation.
- Arrange the proper filing and availability of all drawings, operation, and maintenance manuals.
- List annually all required spare parts, oils, lubricants and other relevant materials for budget purposes and timely ordering.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical engineering.
- Minium of 5 years' experience as a shift engineer in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

1.3 Shift Engineer

Department:

Factory.

General Description:

The Shift Engineer will ensure the smooth mechanical operation of all machinery and equipment in the factory in concert with the Shift Process Supervisor on a shift basis.

Reports to:

Technical Manager.

Duties and Responsibilities:

- Delegate to his subordinate staff the required tasks to ensure the effective mechanical operation of all machinery and equipment in the factory.
- Implement lubrication schemes according to the standard instructions.
- Advise the Shift Process Supervisor on any interruption in production due to mechanical breakdowns.
- Keep records in the shift log-book of all mechanical interruptions and failures, including any information which may be required for the Technical Manager or colleague, taking over his shift, to safeguard the continuous and smooth mechanical operation of the factory.
- Report in time all major breakdowns to the Technical Manager.
- Assist with the overhaul of machinery and equipment during the off-season in a supervisory role.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical engineering.
- Minimum of 3 years' experience as a shift engineer in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 25 years.

1.4 Senior Electrical/Instrument Engineer

Department:

Factory.

General Description:

The Senior Electrical/Instrument Engineer will ensure a smooth and efficient operation of all equipment for the generation and distribution of electric power and of all instrument and automatic controls.

Reports to:

Technical Manager.

Duties and Responsibilities:

- Arrange the provision of spare parts, materials and tools for a proper maintenance and operation of all electrical equipment and instrumentation.
- Delegate to his subordinate staff the required tasks to ensure the effective continuous operation of all electrical equipment and instruments.
- Arrange that his subordinate staff will be adequately trained theoretically as well as practically on-the-job.
- Report in time to the Technical Manager whenever electrical problems arise, which are likely to reduce the operating efficiency of the factory.
- Report on all major breakdowns of electrical equipment to the Technical Manager.
- Arrange that all drawings, showing location and wiring of electrical equipment are neatly filed, updated and readily available for consultation.
- List all required spare parts and materials for budget purposes and timely ordering.
- Prepare overhaul schedules for the off-milling season.
- Prepare standard instructions for repair and maintenance of the electrical equipment.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in electrical engineering, including a general course in process control instrumentation.
- Minimum of 5 years' experience as electrical/instrument engineer in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 35 years.

1.5 Mill Engineer

Department:

Factory.

General Description:

The Mill Engineer will upgrade mill operation and procedures and will plan special maintenance and repairs for the milling plant and cane yard.

Reports to:

Technical Manager.

Duties and Responsibilities:

- Recommend spare parts for equipment of the milling plant and cane yard in concert with the Repair Engineer.
- Analyse the performance figures of the mills and conduct special mill tests such as individual mill control.
- Prepare operation and maintenance instruction during the milling season and instructions for adequate overhaul and repair during the off-season.
- Inspect regularly all equipment of the cane year and milling plant to enable a proper preventive maintenance.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical engineering.
- Minimum of 3 years' experience in operating, maintenance and overhaul of a cane milling plant.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

1.6 Boiler Engineer

Department:

Factory.

General Description:

The Boiler Engineer will upgrade boiler operations and procedures and will plan special maintenance and repairs for the boiler plant.

Reports to:

Technical Manager.

Duties and Responsibilities:

- Supervise feed and boiler water treatment on the basis of the results of relevant analyses executed by the factory laboratory.
- Recommend spare parts for the boilers in concert with the Repair Engineer.
- Analyse recorder charts and records of relevant data in order to take adequate measures for achieving an optimum boiler efficiency.
- Prepare operation and maintenance instructions for during the milling season and instructions for adequate overhal and repair during the off-season.
- Inspect regularly all equipment of the boiler plant to enable a proper preventive maintenance.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical engineering.
- Minimum of 3 years' experience in operating, maintenance and overhaul of a boiler plant in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

1.7 Electrical Engineer

Department:

Factory.

General Description:

The Electrical Engineer will have the direct supervision of the maintenance and repair of all electrical equipment to ensure that all items are in proper working condition.

Reports to:

Senior Electrical/Instrument Engineer.

Duties and Responsibilities:

- Allocate tasks to his subordinate foremen and electricians to maintain an effective continuous operation of all electrical equipment.
- Assess causes of electrical failures and take timely action for repair.
- Keep records of performance data, maintenance and repair of all electrical equipment.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in electrical engineering.
- Minimum of 3 years' experience as electrical engineer in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

1.8 Instrument Engineer

Department:

Factory.

General Description:

The Instrument Engineer will organise preventive maintenance for all factory instrumentation to ensure that all items are in proper working condition.

Reports to:

Senior Electrical/Instrument Engineer.

Duties and Responsibilities:

- Allocate tasks to his subordinate foremen and instrument technicians to maintain an effective continuous operation of all instrumentation.
- Assess causes of instrument failures and take timely action for repair.
- Calibrate and set the instruments in concert with the Engineering and Process Supervising staff.
- Prepare instructions for repair and maintenance.
- Prepare for shift supervisory staff notes on operating principles of installed instruments and on the interpretation of displayed information on controllers and recorders.
- Keep records of performance data, maintenance and repair of all instruments.
- Prepare overhaul schedules for the off-milling season.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in electronic engineering, post-graduate course in process control instrumentation.
- Minimum of 3 years' experience as instrument engineer in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

1.9 Repair Engineer

Department:

Factory.

General Description:

The Repair Engineer will have direct supervision of the mechanical repair of machinery and equipment of the whole factory.

Reports to:

Technical Manager.

Duties and Responsibilities:

- Arrange for timely and effective repair of mechanical defects by the factory repair crew and by the factory workshop.
- Prepare general instructions for an effecive mechanical repair.
- Assist the Technical Manager with preparing schedules for preventive maintenance during the milling season and schedules for factory overhaul during the off-season.
- List spare parts and tools in time for subsequent ordering.
- Keep up to date equipment and machinery records of the causes of mechanical defects and of repairs.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical engineering.
- Minimum of 3 years' experience as repair engineer in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

1.10 Design Technician

Department:

Factory.

General Description:

The Design Technician will plan, organise, direct and control all drawing office activities and will ensure an optimum peformance in the drawing office according to the relevant established engineering standards.

Reports to:

Technical Manager

Duties and Responsibilities:

- Update all existing drawings, tracings, maps, etc. according to the actual situation.
- Arrange that all existing and prepared drawings, tracings, maps etc. of the factory station and other departments are neatly filed and readily available for consultation.
- Prepare standard instructions for drawing procedures, design calculations and application of relevant established engineering standards.
- Ensure that essential equipment and material for the drawing office is available.
- List annually all required drawing office consumables and additional material for budget purposes and timely ordering.
- Prepare detailed drawings to enable the proper execution of modification, rehabilitation and extension of existing equipment and replacement of obsolete equipment by new equipment.
- Prepare from relevant drawings 'take-off lists' for additional material, required for installation and erection of supplied equipment.
- Check whether all prepared drawings comply with the prescribed engineering standards.
- Arrange for other departments preparation of drawings and maps related to topographical and civil engineering aspects.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical engineering.
- Minimum of 5 years' experience in design, design calculations and construction of machinery and equipment, preferably related to the cane sugar industry.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

1.11 Production Manager

Department:

Factory.

General Description:

The Production Manager will coordinate the proper and efficient operation of the factory processing plants in combination with an optimum laboratory performance as for the overall process control.

Reports to:

Factory Manager.

Duties and Responsibilities:

- Delegate tasks and authority to the shift supervisor to ensure an efficient performance of the boiling house.
- Arrange that his subordinate staff at all levels are properly trained.
- Prepare standard operation instructions for each individual processing plant.
- Report proposals for modifications of processing equipment, required for improving its performance.
- Ensure that all factory performance data of the daily, half-monthly, and monthly reports are true and arrived at according to the standard calculation schemes.
- Prepare the annual budget for the timely ordering of consumables and all other relevant materials for processing and the laboratory.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in chemical engineering.
- Post-graduate course in cane sugar technology.
- Minimum of 3 years' experience as production manager in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

1.12 Shift Process Supervisor

Department:

Factory.

General Description:

The Shift Process Supervisor will ensure on a shift basis the proper and efficient operation of the factory processing plants in concert with the Shift Engineer.

Reports to:

Production Manager.

Duties and Responsibilities:

- Delegate to his subordinate staff the tasks, required to ensure an overall optimum performance of the boiling house.
- Ensure at a certain cane throughput an optimum production of sugar of acceptable quality at the most economic consumption of consumables, steam, electric energy, raw and process water.
- Reports in time to the Shift Engineer any mechanical failure of process equipment.
- Check regularly all areas where sugar may be lost due to negligence or faulty operation.
- Record hourly in the shift log-book the actual factory performance data, including any information which may be required for the Production Manager or the next Shift Process Supervisor on duty to safeguard efficient continuous factory operation.
- Ensure that relevant analytical results from the laboratory are communicated in time to the Shift Engineer.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in chemical engineering, post-graduate course in cane sugar technology.
- Minimum of 3 years' experience as shift process supervisor in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 25 years.

1.13 Laboratory Chemist

Department:

Factory.

General Description:

The Laboratory Chemist will supervise the laboratory to ensure that all essential analytical data and reports are available in time for ad hoc information and interpretation.

Reports to: Production Manager.

Duties and Responsibilities:

- Control the correct sampling and proper execution of all analyses according to the standard prescriptions.
- Control the proper recording of analytical results on the relevant standard forms.
- Elaborate the analytical results by means of standard calculation schemes into daily, half-monthly and monthly reports.
- Prepare standard instructions for analysing methods.
- List annually the required laboratory chemicals and other relevant materials.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- Higher National Certificate or similar in analytical chemistry.
- Minimum of 3 years' experience as a laboratory chemist in a cane sugar factory.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 25 years.

1.14 Training Coordinator

Department:

Training Department.

General Description:

The Training Coordinator will carry out planning, organising, leading and controlling of all intentional teaching experiences for trainees/ counterparts and/or local personnel, aimed at performance improvements, until standard performance is reached before or at the end of the stipulated contract period in the most effective and efficient way possible.

Reports to:

General Manager.

Duties and Responsibilities:

- Formulate a training policy plan for the project and have this approved by the General Manager and/or other relevant parties.
- Make an overall analysis, assessment and specification of the project's training needs.
- Prepare and control the required budget for the department.
- Establish a positive attitude towards training by all subject matter experts and trainees.
- Plan and conduct all intentional training activities, the resources needed and develop measures for evaluation of results.
- Establish essential trainee pre-requisites and/or pre-entry requirements.
- Formulate and put into practice alternatives to training where and when required.
- Liaise with all internal and external training resources and ensure their quality, quantity and availability when and where required.
- Ensure the proper documentation and utilisation of all 'course ware' and to adapt these to suit demand.
- Advise on all matters adversely affecting training results and make recommendations for improvement.
- Train project staff to fulfil and carry out their duties/roles as subject matter trainer and/or staff member.
- Make recommendations regarding intake, transfer and dismissal of trainees.

- Develop a training department information system, in line with the overall project information system, containing all relevant data and information required.

Qualifications:

- At least a BEd or BA in training, social pedagogy or equivalent with specialisation in adult education/training.

- At least 10 years' experience in the training field, with proven experience in project training abroad.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Range 35-50 years, preferably over 40 years.

CHAPTER 2

CANE PRODUCTION

2.1 Agricultural Manager

Department: Agricultural Department.

General Description:
The Agricultural Manager will organise the growing of sugar cane and the supply of the planned tonnage of mature, millable cane of good quality to the factory.

Reports to: General Manager

Duties and Responsibilities:
- Direct, coordinate and supervise the activities of the field department.
- Coordinate and supervise the contacts between the field department and other departments at the Estate.
- Direct and supervise the preparation of the annual capital and operation budgets for the field department.
- Control the expenditures of the field department against the current capital and operation budget.
- Set the targets for the season's cane supply, uprooting, planting and ratooning programmes.
- Instruct staff and non-staff workers on their task in writing and verbal communication.
- Arrange and supervise the preparation and presentation of accounts on finance, personnel, materials and progress of planned activities and of reports on studies, investigations and communications.

Qualifications:
MSc or BSc in agriculture; minimum 5 years of practical experience in the agriculture, irrigation and harvesting of sugar cane; minimum 3 years of managerial experience at field manager or assistant field manager level.

Language Ability:
Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 35 years.

Note: The field department consists of the following divisions:
- cultivation (6 sections)
- irrigation/drainage
- mechanical tillages
- harvesting and transport
- agronomy

2.2 Agronomist

Department: Agronomy Department.

General Description:

The agronomist will be in charge of the Agronomy Department and will guide field and laboratory research in order to supply the estate with agro-technical information, aimed at the improvement/optimisation of the production and quality of sugar cane.

Reports to: General Manager

Duties and Responsibilities:

- Draft research programmes and the corresponding budget on the agriculture of sugar cane in consultation with the Agricultural Manager.

- Control and supervise the implementation of the research programme.

- Examine the need for improvement in the work methods on introduction of:
  - new varieties
  - seed cane supply
  - land preparation
  - planting, ratooning
  - cultivation, manual and mechanical fertilising
  - irrigation
  - control of weeds, pests and diseases
  - harvesting and transport
  - cane quality

- Examine the need for improvement and investigation on subjects such as:
  - soils classification
  - salinity
  - drainage
  - field layout and irrigation efficiency
  - cane rotation, cycles
  - crop physiology
  - test field techniques

- Direct and supervise or undertake personally the preparation of periodical and annual reporting on results of field tests, studies and investigations by the Agronomy Department.

Qualifications:

MSc in Agriculture; at least 5 years of experience in sugar cane agriculture and preferably also experience in gravity irrigation and field mechanisation; should score well in verbal and written communication.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 35 years.

2.3 Manager Mechanised Agricultural Operations

Department: Agricultural Department.

General Description:

The manager for mechanised agricultural operations organises the mechanical operations for the cultivation of sugar cane, and directs the action of equipment and services in accordance with the operational planning of cane cultivation as drafted by the Cultivation Manager.

Reports to: Agricultural Manager

Duties and Responsibilities:

- Develop the planning of the use of agricultual equipment during the next year in compliance with the overall planning of the cane production as drafted by the Field Manager Cultivation.
- Determine the allocation, logistics and mobilisation of agricultural machinery.
- Supervise the use of the agricultural equipment and control the efficiency and quality of its performance.
- Prepare the periodical and annual reporting on the availability, allocation, output, performance and cost of the mechanical cultivations.
- Prepare the annual budget, based on next year's requirements and on current experience in output.
- Communicate with the Field Manager Cultivation and with Section Managers on planned mechanical cultivation prior to implementation.
- Communicate with the Manager of the Farm Machinery and Transport Workshop on requirements, availability, condition and performance of the agricultural equipment.

Qualifications:

MSc or BSc in Agriculture; at least 5 years of practical experience in the agriculture and irrigation of sugar cane; experience in administration and coordination within a field department of a large plantation would be advantageous.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 25 years.

2.4 Irrigation and Drainage Manager

Department:

Agricultural Department.

General Description:

The irrigation and drainage manager will be responsible for overall control of all irrigation and drainage functions on the Estate.

Reports to: Agricultural Manager

Duties and Responsibilities:

- Direct all irrigation and drainage functions.
- Liaise with the Agronomist and Manager Farms to ensure that irrigation water is distributed in accordance with needs.
- Oversee the establishment and implementation of an irrigation scheduling programme.
- Oversee the establishment and implementation of an operation and maintenance programme for the irrigation and drainage works.
- Establish a training programme for irrigation staff.
- Budgetary control of the irrigation section.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of our expertise, both with on the job and off the job training.

Qualifications:

BSc degree in civil engineering or agricultural engineering (or similar qualification). At least 3 years' experience of irrigation scheme management. Experience of design and construction of irrigation works an advantage.

Age: Minimum 35 years.

2.5 Harvesting and Transport Manager

Department: Agricultural Department.

General Description:

To arrange for the harvesting of all commercial cane of the project either manually or by machine, the subsequent loading and transport operations with the minimum cost and loss of cane in the shortest possible time between cutting and arrival at the factory unloading plant.

Reports to: Agricultural Manager.

Duties and Responsibilities:

- Determine the harvesting sequence of the fields in consultation with the Agricultural Manager with the help of the results obtained from maturity analyses of cane samples he has collected.

- Arrange for a proper burning of the cane fields prior to harvesting taking into account the necessary safety precautions.

- Arrange that cutting of cane is done in the proper way and that field losses are reduced to the bare minimum.

- Organise the harvesting and transport system in such a way that all cane arrives at the factory within 30 hours after harvesting to reduce losses resulting from deterioration of the cane after cutting.

- Take good care of all mechanical equipment assigned to the department, adhere to standard service and maintenance schedules and to report on any failure of the equipment to the farm machinery and transport workshop staff.

- Communicate with the factory staff on cane requirements and crushing rates, several times per day, in order to supply the correct quantity of fresh cane to the factory.

- Advise and assist in the selection of harvesting and transport equipment, to optimise on operational practices of the equipment and to determine the long-term aspects of the harvesting and transport system.

- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

BSc in Agriculture or Agricultural Engineering. At least 8' years experience in the agricultural part of a sugar industry of which at least 3 years' in the harvesting and transport of sugar cane. Experience with mechanised harvesting operations for at least 1 year.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: 35 years or over.

2.6 Manager Farms

Department:

Agricultural Department.

General Description:

The manager farms gives guidance to the section managers, who are responsible for all plantation work within their sections, controls the quality and the progress of all plantation work, and the agricultural and financial administration of the sections.

Reports to: Agricultural Manager

Duties and Responsibilities:

- Plan the timing, sequence and scope of all agricultural activities in the cane area of the estate.
- Supervise the daily maintenance of all cane fields.
- Responsible for the yield and quality of the cane all over the estate.
- Prepare the annual budgets on manual tillages and on the sections' activities, and control the corresponding expenditures.
- Prepare the progress reports on the sections' activities and the annual reports on seed cane, manual tillages and the cane and sugar yields per cane field, cane variety and otherwise if relevant.

Qualifications:

MSc or BSc in Agriculture; minimum 5 years of practical experience in the agriculture and irrigation of sugar cane; preferably also experience in administrative and coordinative work within a field department of a large plantation.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

2.7 Assistant Agronomist

Department:

Agronomy Department.

General Description:

The assistant agronomist will provide general assistance to the agronomist in the fulfilment of the tasks of the Agronomy Department.

Reports to:

Agronomist

Duties and Responsibilities:

- Direct and supervise the daily administrative activities at the office of the Agronomy Department.
- Undertake the design, implementation and reporting of those parts of the annual research programme, delegated to his responsibility by the Principal Agronomist.

Qualifications:

MSc or BSc in Agriculture; 3 to 5 years of experience in sugar cane or any other annual crop; training and experience in experimental methods, statistics and computation of testfield results.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: 25-30 years.

2.8 Distribution Controller

Department:

Agricultural Department

General Description:

Working under the general direction of the irrigation manager, the distribution controller will be responsible for all irrigation supply and distribution functions.

Reports to:

Irrigation and Drainage Manager.

Duties and Responsibilities:

- In charge of the operation of all irrigation and drainage works.
- Preparation of regular irrigation schedules to ensure optimum use of available water to meet the needs established by the agricultural department, and implementation of these.
- Supervise a monitoring programme on water quality, river flow, sediment load, groundwater level, and canal and drain flows, and maintain continuous records.
- Identify training needs.
- Liaison with maintenance controller to identify problem areas and resolve these.
- Development of canal operating rules.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

Either: BSc degree in civil/agricultural engineering (or similar qualification). At least 2 years' experience in surface irrigation operation, and 2 years' minimum experience of irrigation system design.

Or: At least 5 years experience of surface irrigation scheme operation.

Age: Minimum 30 years.

2.9 Maintenance Technician

Department:

Agricultural Department

Reports to:

Irrigation and Drainage Manager

Duties and Responsibilities:

- Responsible for an intensive training programme for maintenance plant operators to include :

  operating techniques

  safety

  care and maintenance of plant.

- Assisting the maintenance controller in drawing up channel maintenance schedules.

Qualifications:

At least 10 years' practical experience in the use of maintenance plant (generally earthmoving machinery, including draglines, hydraulic excavators, bulldozers, ditchers, etc.).

Age: Minimum 30 years.

2.10 Surveyor

Department:

Agricultural Department

Reports to:

Irrigation and Drainage Manager

Duties and Responsibilities:

- Survey of canal and drain cross sections and longitudinal sections.
- Land levelling survey.
- Preparation and up-dating of irrigation and drainage layout plans and channel details.
- Checking bench marks and water level gauges.
- Various other duties including river flow gauging, training assistant surveyors, etc.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

Appropriate surveying qualifications and minimum 5 years relevant practical experience.

Age: Minimum 25 years.

CHAPTER 3

MANAGEMENT FINANCE

3.1 Adviser to the General Manager and Personnel Manager

Department:

General Management Department.

General Description:

To assist the General Manager in all aspects of the management of the Estate and to advise him whenever required, requested and/or unrequested, aiming at improvements of the overall operation and maintenance of the plantation, factory and all other utilities, services, duties and tasks as seems appropriate.

To advise the Personnel Manager regarding personnel policy formulation and execution whenever required to ameliorate human resource utilisation and development in line with both the country's laws and regulations and the overall Estates policy.

Reports to:

General Manager.

Duties and Responsibilities:

- Liaise with all members of the management team in so far as required to carry out his job.
- Collect and prepare all relevant data and information for the smooth running of the General Management office.
- Analyse data and advise the General Manager about improvements in all aspects of the Estate operations.
- To advise on the formulation and execution of the Estate's personnel policy.
- To advise Personnel Manager in all aspects of Personnel Department's activities as might be required.
- Advise other managers on their request regarding their operations/departments and/or activities.
- Liaise with relevant outside parties with the General Manager's approval.
- Do any other duty or task as may be assigned by the General Manager.
- Assist the Training Department with the analysis for and the preparation of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Conditions/Unusual Features of the Job:

This job is created on the General Manager's request. The actual job and what it will contain in terms of duties will very much depend upon the cooperation and delegation between the General Manager and his Assistant. The same can be said of the Advisor to the Personnel Manager's part of the job. The cooperation and role division of these staff members are factors influencing the duties and tasks to be done. This can only be worked out later.

Qualifications:

- MSc in agriculture or equivalent management training an advantage.

- At least 15 years' experience in the sugar cane estate/factory management, proven experience as General Manager of an estate of about the same size of operations.

  It would be an advantage if the candidate has experience in personnel work in general, affinity towards personnel policy is essential.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Range 45-60 years.

3.2 Financial Manager

Department:

Finance and Administration Department.

General Description:

The Financial Manager will plan, programme and coordinate the activities of the various sections of the Finance and Administration Department to ensure an efficient operation of this department and assist the General Manager in his policy-making.

Reports to: General Manager.

Duties and Responsibilities:

- Delegate tasks and authority to his subordinate supervisory staff as required for the effective execution of activities in the finance, accounts, stores and purchase sections.

- Prepare and introduce sound and uniform methods and procedures in registering and administering for interdepartmental reference.

- Develop modernisation of accounting, purchase and store-systems and introduce mechanisation where possible.

- Maintain for the Company a liquidity position in the best possible manner.

- Maintain a proper relationship with:

  banks and other financial institutions related to the Company's finances;
  relevant Government authorities;
  external auditors;
  local suppliers on payment and delivery conditions;
  department heads of the Company.

- Achieve the timely preparation of all administrative affairs in the department, which includes:

  monthly financial record;
  annual capital and operating budget;
  annual final accounts;
  cash-flows.

- Judge financial statements produced by subordinate staff for making analyses and notes for the management and third parties.

- Arrange that sufficient qualified staff is available and that the subordinate staff on all levels are adequately trained, theoretically as well as practically on-the-job.

- Assess annually, in consultation with the higher staff of the sections, the professional conduct of the personnel of the department for remuneration and promotion purposes.

- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- Recognised accounting qualification.

- At least 10 years' experience in industrial accounting and at least 3 years as a section head of a large accounts department.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 35 years.

3.3 Stores Manager

Department:

Finance and Administration Department.

General Description:

The Stores Manager will coordinate/supervise all activities in the stores ensuring a safe custody of stores items and a smooth materials supply.

Reports to: Financial Manager.

Duties and Responsibilities:

- Delegate tasks and authority to his subordinate staff/personnel as required for the effective operation of the stores.
- Introduce and upkeep of a proper stores modification system in cooperation with the department heads concerned.
- Supervise on the proper implementation of the stores procedures.
- Ensure proper storage of goods to avoid losses.
- Exercise stock control by fixing stock levels in cooperation with department heads concerned (minimum re-ordering level, maximum level).
- Prepare quarterly lists of slow moving items and to initiate action for disposal with the head of department concerned.
- Conduct perpetual stock taking and annual stock valuation.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- A good standard of secondary education.
- A recognised stores qualification and minimum of 5 years' experience in stores-management duties with a large industrial organisation.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

3.4 Budget/Cost Accountant

Department:

Finance and Administration Department.

General Description:

The Budget/Cost Accountant coordinates and supervises the activities of the budget and cost control section.

Reports to:

Financial Manager.

Duties and Responsibilities:

- Compile and contribute to the timely preparation of capital and operating budgets, based on basic data approved by general management.
- Investigate and record the deviations between budget figures and actual expenditure.
- Prepare reports for the Financial Manager with analyses of variances between actual and budgeted performance.
- Prepare data for the financial information system to be used as a tool of management for present and future operations.
- Control the actual data for the fixed assets administration and the annual depreciation amounts.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- A recognised qualification in accountancy.
- Minimum of 5 years' experience in senior accounting position in a big organisation.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: Minimum 30 years.

CHAPTER 4

ROLLING STOCK MAINTENANCE

4.1 Farm Machinery and Transport Workshop Manager

Department:

Farm Machinery and Transport Department.

General Description:

To establish and maintain an adequate organisation of the farm machinery and transport workshop, including the maintenance of all rolling stock and the supply of spare parts resulting in the highest possible availability rate of the equipment at the lowest costs for both operations and maintenance.

Reports to: General Manager.

Duties and Responsibilities:

- Arrange in a combined effort with accounts and purchasing departments for the supply and storage of the required technical spare parts and consumables.

- Work out together with the agricultural manager proposals that may lead to a more efficient use of the equipment, the modifications of same or the eventual purchase of new equipment to carry out all possible activities in the plantation.

- Compose the necessary budgets for capital, operation and personnel requirements including costs.

- Organise and supervise the various sections in the farm machinery and transport workshop in charge of operation and maintenance of all equipment both inside and outside the workshop.

- Establish and control the record-keeping on all required data to determine the operation and maintenance costs of all equipment including budgets and replacement schedules.

- Collect information as to future maintenance and repair requirements as well as replacement policy and extension of equipment in order to ensure an adequate ordering and stock policy for spare parts.

- Ensure that extensive training programmes both in special training courses and on the job are being implemented and continued.

- Ensure that all workshop facilities including mobile units are in good order and establish safe working conditions.

- Maintain good working relations between the various workshop sections under his control as well as with the user departments and suppliers.

- Responsible for discipline of all personnel assigned to his department and to deal with the general personnel problems in this department.

- Ensure, in concert with the accounts department, that the stores holding spares for his department is managed in the proper way and that store procedures are adequate and kept up-to-date to suit both the technical and accounts requirements.

- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc degree in mechanical or automotive engineering or equivalent.

- At least 5 years' experience in the management of similar workshops in tropical countries, not necessarily in the sugar industry.

- In addition at least 10 years' experience in the actual maintenance and repair of all kinds of rolling equipment.

- Experience in the administrative field and store procedures including stock policies.

- Good organisational ability.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: At least 35 years.

4.2 Assistant Farm Machinery and Transport Workshop Manager

Department:

Farm Machinery and Transport Department

General Description:

To arrange for proper maintenance schedules and procedures for all equipment handled by the department, to make proposals for more effective and efficient use of both personnel and equipment in fields and workshops and to replace the farm machinery and transport manager during his absence.

Reports to:

Farm Machinery and Transport Workshop Manager.

Duties and Responsibilities:

- Establish and implement the scheduled and unscheduled maintenance of the rolling stock and the provision of spare parts, materials and tools essential for efficient operation.
- Arrange that all workshop facilities, including mobile facilities for maintenance are in good and safe working order.
- Provide basic information on requirements for supply and storage of the required spares and consumables.
- Prepare maintenance and service schedules for all equipment under maintenance.
- Investigate and control fault diagnosis on all breakdowns.
- Control and establish a library holding all engineering drawings, spare part books, workshop manuals, etc. which relate to the plant and equipment under his span of control.
- Propose addition/reduction of personnel, inclusive of the required skills as well as of equipment which is required to ensure a smooth and economic operation of the workshop to the farm machinery and transport manager.
- Allocate tasks to subordinates to maintain an effective service to the various departments which are dependent on workshop assistance.
- Arrange for proper recording of all work done and to be done in the workshops for all rolling stock, equipment and machinery.
- Assist in the preparation of annual budgets, replacement schedules and manpower planning.

- Keep a strict control on the operation budgets for the equipment.

- Arrange for a good working atmosphere within the various sections under his control as well as with the users of the equipment and to establish safe and clean working conditions for technicians and operators.

- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSC degree in mechanical or automotive engineering.

- At least 2 years' experience in the management of similar workshops in tropical countries, not necessarily in the sugar industry.

- At least 10 years' experience in the actual maintenance and repair of all kinds of rolling equipment.

- Basic knowledge of store procedures and policies.

- Good organisational ability.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: At least 35 years.

4.3 Factory Workshop Manager

Department:

Factory Department.

General Description:

To establish and maintain a smooth organisation and operation of the machine shop, boilermaker shop and carpenter shop, to repair and manufacture equipment components insofar as workshop equipment and skills are available and to arrange for third party assistance if so required.

Reports to:

Factory Manager.

Duties and Responsibilities:

- Propose to the factory manager the requirements in terms of raw and semi-fabricated materials, workshop equipment, personnel and skills to ensure optimal performance and assistance to client departments.

- Ensure that all workshop facilities are in good and safe working order.

- Allocate tasks to subordinates to maintain an effective service to the various departments which are dependent on workshop assistance.

- Arrange for a proper planning and recording of all work done and to be done in the workshops.

- Arrange for a good working atmosphere within the various workshops under his control and to establish safe and clean working conditions.

- Arrange for good working drawings or sketches for all equipment components to be made in the workshops and for proper instructions as to what materials are to be used and the sequence of the required operations.

- Ensure an equal work-load in the workshops by scheduling repairs and manufacture of parts well in advance of the non-crushing period in close consultation with the heavy plant engineer and farm machinery and transport manager.

- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical engineering.
- At least 3 years' experience in the management of similar workshops, not necessarily in the sugar industry.
- At least 10 years' experience in the actual operation of the various workshop machineries.
- Good organisational ability.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: At least 35 years.

4.4 Heavy Plant Engineer

Department:

Farm Machinery and Transport Department.

General Description:

To carry out the maintenance, repair and overhaul, both scheduled and unscheduled, of wheel tractors, crawlers, loaders, excavators, draglines, diesel power plants, trailers and implements, and to determine the long and short term requirements on spare parts for the equipment under his control and report in detail on the equipment condition to his superior.

Reports to:

Assistant Farm Machinery and Transport Workshop Manager.

Duties and Responsibilities:

- Control of operation and maintenance of all equipment assigned to his responsibility with the help of standard instructions, maintenance and service charges.

- Supervise and participate with the actual execution of maintenance, repair and service activities both in the field and inside the transport workshop

- Supervise and participate in the activities of various mobile repair and service units, if assigned to his section, e.g. during weekend services, which also perform duties in the cane fields.

- Provide the required detailed information to enable the proper record-keeping as to the operation and maintenance costs of each important individual part of the rolling stock and equipment.

- Report on future maintenance requirements and make out spare part requisitions well ahead of time, taking into consideration long ordering procedures and delivery times.

- Participate in discussions regarding proposals as to replacement of equipment supported by actual and future exploitation and maintenance costs or insufficient performance of available equipment.

- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical or automative engineering or equivalent education by special courses focused on the equipment under his direct control.

- At least 8 years' experience in the maintenance, repair and overhaul of similar equipment not necessarily in the sugar industry.
- Experience in both in-class and on-the-job training of technical personnel.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: At least 30 years.

4.5 General Farm Machinery and Transport Workshop Engineer

Department:

Farm Machinery and Transport Department.

General Description:

To carry out the scheduled and unscheduled maintenance of locomotives, rail carts and rails inside the workshops, routine services to all equipment that rely on those services in the workshop at Farm IV, all services and repairs to equipment that are not sent to the workshop for routine services, or that require repair both inside and outside the Estate, and replace the Assistant Farm Machinery and Transport Workshop Manager in case of his absence.

Reports to:

Farm Machinery and Transport Workshop Manager.

Duties and Responsibilities:

- Control of operation and maintenance of all equipment assigned to his responsibility with the help of standard instructions, maintenance and service charges.

- Supervise and participate with the actual execution of maintenance, repair and service activities both in the field and inside the transport workshop.

- Supervise and participate in the activities of various mobile repair and service units, if assigned to his section, which also perform duties in the cane fields and outside the project area.

- Provide the required detailed information to enable the proper record-keeping as to the operation and maintenance costs of each important individual part of the rolling stock and equipment.

- Report on future maintenance requirements and make out spare part requisitions well ahead of time, taking into consideration long ordering procedures and delivery times.

- Participate in discussions regarding proposals as to replacement of equipment supported by actual and future exploitation and maintenance costs or insufficient performance of available equipment.

- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical or automative engineering.
- At least 10 years' experience in the maintenance and repair of similar equipment of which at least 2 years' was in tropical countries, but not necessarily in the sugar industry.
- Experience in both classroom and on-the-job training.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: At least 30 years.

4.6 Motor Vehicle Engineer

Department:

Farm Machinery and Transport Department.

General Description:

To carry out the scheduled and unscheduled maintenance, repair and overhaul of cars, trucks, buses, motorcycles, tyres and fuel pumps, as well as of the electrical aspects of all equipment and to determine the long and short term requirements on spare parts for the equipment under his control and report in detail on the condition of this equipment to his superior.

Reports to:

Assistant Farm Machinery and Transport Workshop Manager.

Duties and Responsibilities:

- Control of operation and maintenance of all equipment assigned to his responsibility with the help of standard instructions, maintenance and service charges.

- Supervise and participate with the actual execution of maintenance, repair and service activities both in the field and inside the transport workshop.

- Supervise and participate in the activities of various mobile repair and service units, if assigned to his section, e.g. during weekend services, which also perform duties in the cane fields.

- Provide the required detailed information to enable the proper record-keeping as to the operation and maintenance costs of each important individual part of the rolling stock and equipment.

- Report on future maintenance requirements and make out spare part requisitions well ahead of time, taking into consideration long ordering procedures and delivery times.

- Participate in discussions regarding proposals as to replacement of equipment supported by actual and future exploitation and maintenance costs or insufficient performance of available equipment.

- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- BSc in mechanical and automative engineering or equivalent education by special courses focused on the equipment under his direct control.
- At least 8 years' experience in the maintenance, repair and overhaul of similar equipment not necessarily in the sugar industry.
- Experience in both in-class and on-the-job training of technical personnel.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: At least 30 years.

4.7 Machine Shop Supervisor

Department:

Factory Department.

General Description:

To repair and manufacture equipment components for all the departments at the Estate depending on equipment that is exclusively available in the machine shop and to arrange for adequate supply of raw materials and tools to the machine shop personnel.

Reports to:

Factory Workshop Manager.

Duties and Responsibilities:

- Maintain the workshop machinery and tools in the proper way.
- Allocate tasks to machinists, welders, mechanics, etc. with the correct instructions as to the actual execution of these tasks.
- Replace the Workshop Manager during his absence.
- Carry out the various activities according to the schedules prepared by the Workshop Manager.
- Assist the Training Department with the preparations of training programmes and act as trainer/instructor as required in the field of own expertise, both with on the job and off the job training.

Qualifications:

- Engineering College certificate in metal removing operations.
- At least 8 years' experience in the actual operation of the various workshop machineries.

Language Ability:

Fluent in English, preference working knowledge of Somali/Italian.

Age: At least 30 years.

CHAPTER 5

PRESENT KEY PERSONNEL

SOMALI DEMOCRATIC REPUBLIC
REHABILITATION OF JOWHAR SUGAR ESTATE

Key Personnel as at 1.07.1983

Serial Nr	Post	Held by (name)	Educational background			Age (years)	Professional Experience		
			Degree level	Subject	University or equivalent		Number of professional years	Years with SNAI	Years in actual or equivalent post
1	General Manager	Dr. Cumar Hersi Cumar		Econ.	Degree	41	14	1st year	
2	Deputy General Manager	Mr. Hassan Adan Kalinseh		Admin.	Equiv.	42	24	1st year	
3	Factory Manager	Mr. Mohamed Sh. Abdimehi		Chm. Eng.	Degree	32	8	8	1
4	Manager Agriculture	Mr. Nur Mohamed Nur		Agr.	Equiv.	35	14	14	1
5	Manager Finance	Mr. Muhtar Abukar		Pol. Sc.	Degree	35	13	1	1
6	Manager Commerce	Mr. Bana Mohamed Siyad		Econ.	Degree	-	9	9	-
7	Manager Personnel	Mr. Yakob Sidow		Admin.	Equiv.	40	22	22	7
8	Manager BIASA	-		-	-	-	-	-	-