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19373

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

PROJECT OF THE GOVERNMENT OF SUDAN

PROJECT DOCUMENT

Title: Rehabilitation of the industrial enterprises that will remain state-owned for the foreseeable future.
Phase I: Sugar sub-sector, namely, the Sudanese Sugar Production Co. and its four factories, "Guneid, Halfa, Assalaya and Sennar".

Number: Country: The Republic of Sudan

Total UNIDO budget: US\$: 647,300

Estimated Starting Date. Planned Duration: 12 Months

Backstopping section/Branch: IO/IIS/IMRB

Government Implementing Agency: The Ministry of Industry-
The Sudanese Sugar Production Co. :
(SSPC).

Official Government request and endorsement Date:
by the UNDP Resident Representative
Telex from UNDP Sudan

Brief description:

The development objective is to increase the share of the industrial sector in the recovery and revitalization of the national economy, and the project will contribute towards this goal through rehabilitating of the industrial enterprises that will remain state-owned for the foreseeable future in order to increase industrial output and employment, improving the trade balance and improving of management performance. The assistance includes installation and implementation of management information system for cost accounting and finance, payroll, personnel and stock control. Also the assistance includes maintenance management and On-The-Job training for maintenance staff. The project also will submit a project appraisal for major physical rehabilitation, and proposal for organization structure based on the optimum utilization of human resources with incentive wage scheme based on actual workload and, finally, diagnostic on the establishment of training capacity and mechanism at the National Sugar Training center.

On behalf of:	Signature	Date	Name/Title
The Government:	_____	_____	_____
Executing agency:	_____	_____	_____
UNDP:	_____	_____	_____

A. CONTEXT

A.1 Overview of The Manufacturing Sector:

The manufacturing sector in Sudan remains relatively small. Manufacturing and mining together contributed to only 8.2% of the GDP in 1988/89 and the sector employs about 200,000 people, representing about 4% of the total work force inside the country.

Production has traditionally involved light consumer goods, utilizing agriculture raw materials, food, beverage and tobacco subsector and the textile, wearing apparel and leather subsector. Food, beverage and tobacco subsector accounted for almost 77% of the gross MVA, 78% of the total number of manufacturing enterprises and about 61% of the total manufacturing employment according to the latest available data 1981/82. The metal products subsector was the second most important, generating 6.6% of MVA and chemical products subsector ranked third and generating 6.1% MVA. While the textile, wearing apparel and leather products accounted for more than 2% of the total number of establishments and 4.6% of MVA, it contributed 19.7% of total manufacturing employment and 6.9% of gross output.

The remaining manufacturing activity was dispersed between a wide range of activities including the manufacturing of wood products and furniture, paper and printing, building materials and non-metallic materials and basic metals. These enterprises generally produced consumer goods intended for the domestic market.

Public sector participation in the manufacturing sector began in the early 1960s and for a brief period following the nationalization of private sector enterprises in 1970 the public sector dominated the industrial sector due to both nationalization and the increased direct government investment in manufacturing. Even though substantial government investment during the 1970's, the return of the nationalized enterprises to their former owners led to the reduction in the number of public sector enterprises engaged in manufacturing.

By the time of the 1981/82 Industrial Survey, there were only 50 public sector manufacturing enterprises. These enterprises generated 5.1% of the total gross MVA and 6% of gross output, but 10.4% of the MVA generated by large-scale enterprises. They employ 19.2% of the work-force employed in manufacturing. Public sector participation in manufacturing was mainly in the food processing subsector, principally sugar refining, textiles, tanneries and printing. The government also held a monopoly in the cement manufacturing.

The rapid growth of the industrial sector due to the heavy investment during the 1970's, faced rapid deterioration due to severe shortages of trained manpower, raw materials and the foreign exchange needed for importing essential intermediate inputs. Production cost have increased due to a series of devaluation of the Sudanese pound. These, coupled with infrastructural bottle neck, have led to drastic fall in capacity utilization and resulted in the closure of many manufacturing enterprises and in a serious consequences on industrial output, performance and economic growth of the country as a whole.

A.2 The Sugar Sub-sector:

Until 1981 the four sugar estates of the public sector were run by the sugar Distilleries Corporation (SDC), a public body responsible to the Ministry of Industry (MOI) which provided such centralized services as procurement, training, accounting and budgeting.

In an effort to decentralize the industry the corporation was dissolved and authority was given for the formation of four autonomous companies. These companies have been formally established under the companies ordinance and will operate as wholly self-contained entities, with only sector policy issues such as pricing, taxation and levels of import and export being determined centrally.

The need for a central body and organizational reform was recognized in early 1988 and the government of Sudan took steps in 1989/90 for the formation of a holding company as an entity called "Sudanese Sugar Production Co. (SSPC)". The new company has been established under the 1925 companies act, and at the time of this study was envisaged by the appointed chairman, not as a "holding" company in the normal sense but as one Sugar Producing Company with four Production Units. There would be one board of directors. Activities to be carried out at the center would be:

- Central procurement and purchasing.
- Manpower planning and training.
- Coordination of equipment needs.
- Research and development.
- Marketing of by-products.

The plan is to have one consolidated budget so that the individual production units submit their budgets to the center and one budget is presented to the Ministries of Industry and of Finance and Economic Planning.

A.2.1 The Sudanese Sugar Production Company (SSPC):

Today the four sugar factories are registered as one company named (SSPC) and as the (SSPC) is taking over, its strategy is to increase productivity and reach for the designed capacities.

Guneid was the first founded factory in 1962 with design capacity of 60,000 Tons/year, followed by Halfa in 1965 with 75,000 Tons design capacity, then later Sennar and Assalaya Sugar factories started production in 1976 and 1979 respectively with annual capacity of 110,000 Tons each. The four factories own a total plantation area of 135,000 acres with a total crushing capacity rated at some 18,000 - 20,000 Tons of cane per day, and a total permanent employees of 8,500 plus 10,000 - 15,000 during the season.

A.3 Government Strategy and objectives:

The Government has launched its National Economic Salvation Programme (1990 - 1993) with the framework of the new economic recovery programme. The general objectives can be summarized as follows:

- Revitalization of the Sudanese economy through reallocation of resources towards production.
- Enhancement of the role of the private sector, whether national or foreign, to play more active role in achieving the objectives of the programme and to reorient financial, economic and institutional structure to create more conducive environment for private sector participation.
- Maintenance of social balance by protecting the poor during adjustment period.

A.3.1 General means of the programme

- a) To put more emphasis on agricultural development as a leading sector.
- b) Encouragement of export through liberalization of export prices and scrapping the export license system and by providing subsidies if needed.
- c) Mobilization of domestic and external resources by encouraging all nationals to use their resources in a productive manner and by creating environment conducive to domestic and foreign private sector investment, particularly for investors from Arab and Islamic world. Efforts also will be made to obtain more external financial assistance from any sources agreeing to the objectives of the programme.
- d) To implement institutional reforms to remove all administrative, economic or legal impediments to pave the way for investors through:
 - Removal of Government monopoly in the areas of agriculture, industrial production, domestic marketing, foreign trade, and economic services; and opening the door for private sector in all areas of economic activity with the exception of the mining for oil production.
 - Fundamental reform of the parastatal sector through liquidation, privatization or turning public enterprises into joint ventures with domestic and foreign private sector participation.
 - Institutional and legal reforms including laws governing taxation, custom duties, prices and industrial relations to facilitate and enhance more efficient resources allocations.
 - A comprehensive review of the credit system and the consideration governing provision of bank credit to public and private sectors with the aim of linking bank credit to production in the context of national priorities.

- The deregulations of price and profit controls starting with an immediate and complete liberalization of exports, prices to be followed by gradual deregulation of most prices of goods and limiting price control to a short list of basic items.
- Introduction of a wide & comprehensive social solidarity system to care for the low-income segments of society by mitigating the higher costs which normally accompany restructuring of the economy.

A.4 Prior and ongoing technical cooperation:

During the last ten years several significant projects have been undertaken by UNIDO in the Republic of Sudan focussing attention on industrial manpower development and requirements.

A.4.1 Project RP/SUD/83/002 was a national survey in which the sugar industry was studied along with others, and project RP/SUD/83/004 "An Assessment of the Training Needs and Training Plan for the Sudan Sugar Industry" also referred to the establishment of Sugar Institute of Sudan.

A proposal document - "Sennar Sugar Training Center - Sudan" resulted from project RP/SUD/84/001.

Resulting from these projects there has been a continuous development of expertise and information within UNIDO to support any activities within the sugar sector of which project SF/SUD/86/003 was part and was assisted further by supplementary support project XP/SUD/88/122. The development objective of the project was to increase the production, reduced production cost through improved efficiency by providing the skilled manpower through training as part of a rehabilitation project. Only the preparatory phase of project SF/SUD/86/003 was completed, and the implementation phase was canceled due to the reallocation of funds by (SPIC) the sugar project implementation committee (GOS agency).

A.4.2 The Sugar Rehabilitation Project:

In the early 1980's the World Bank gave priority role in the overall economic recovery programme of the country to the sugar industry.

Feasibility studies for IDA began 1982, project component and co-financiers were identified, and in August 1984 a credit agreement was signed which involved a total investment of US\$ 181 million in the four state-owned sugar companies of the five-years period to mid-1990. The initial target was to increase sugar output by the four companies from 192,000 Tons in 1984/85 to 278,000 Tons by 1992/93. There were three main components of the programme:

- Physical rehabilitation.
- Measures to insure production inputs.
- Improvement in management and institutional arrangement between the four estates.

Initial progress on the project was disappointing (only 34% capacity utilization), but in the following years 1988/90 and 1990/91 capacity utilization has increased to 43% & 51% respectively. The project is now expected to be completed by mid 1993, from its effective start date 1986, that is within an operational time frame of seven years as against five years in the initial planning. Main reasons are Loan suspension of the Arab and Saudi funds and insufficient institutional capacity to handle the volume of work within scheduled time frame. Therefore a new core programme (NCP) has been initiated to set priorities and to further re-structure the programme of the project keeping in view that only IDA funds would be available in the time frame envisaged for completion and put on hold components that are currently need financing amount of \$ 29 million.

A.4.3 Public Enterprise and Economic Management Project

(PEEMP CO. , 1789-SW) - World Bank.

The project was to provide assistance to:

- Public Enterprise Reform.
- Improved National Planning & Financial Management.
- Improvement of Human Resources Management.

The project budget was about \$ 11.5 Million for disbursement over (8) year period 1988/1995.

Recently, the GOS and the World Bank agreed upon redefining the use of the remaining funds available in order to be used for strengthening the privatization programme which is in the final stage of preparation at the time of writing this document.

The privatization programme estimated budget is \$ 6 million and the expected completion date is end of 1993 (Two years) with the following objectives:

- Privatizing selected enterprises.
- Increase the capabilities of the GOS of Sudan officials to implement the privatization process.
- Improving the environment for privatization.
- Identifying the impact of the programme.

A.5 Institutional framework for the industrial sector:

Three ministries deal with the manufacturing sector directly. The Ministry of Industry is primarily responsible for articulation of industrial policies and strategies in consonance with national priorities. It is also discharge regulatory and monitoring functions such as granting concessions, supervising public enterprises, controlling prices, drafting foreign exchange budgets for industry, and participating in the issuing of licenses for new ventures.

The Ministry of Finance and Economy is also involved in industrial planning and policy formulation and implementation. Within the Ministry there is a Bureau of investment and a unit responsible for feasibility studies and project studies. The Ministry determines taxation policies and foreign exchange rate which have an important impact on the operation of the industrial sector. It is also co-operate with the Ministry of Industry in regulating the granting of concessions and in supervising price controls. The Ministry of trade handles most issues involving import and export, other institutions involved in the promotion and finance of manufacturing industry include:

- Industrial Development Bank of Sudan which extends long term credit to industrial establishments;
- Sudanese Investment Bank which is a jointly owned by private and public sectors and finances investment projects in all sectors of the economy;
- Sudan Development Corporation (SDC) which deal with project identification, formulation and implementation of projects and the mobilization of both domestic and foreign capital to finance industrial and other projects particularly large-scale projects.
- Sudanese saving Bank which taps funds from small savers for financing industrial and development projects.

There is a National Council for Research which co-ordinates research activities in various research institutions such as the scientific and Technological Research Council and the Industrial Research and Consultancy Center. These research institutions could form a nucleus for the development of a productive research activity.

B. PROJECT JUSTIFICATIONS

B.1 Problem to be addressed: the present situation:

Capacity utilization in Sugar Production has increased from 34% in 88/89 to 43% in 89/90 to 51% in 90/91 and there still room for further improvement. The major constraints on improved performance have been summarized as follows:

- Production units are rarely in a position to recoup the full cost of production. Profitability is low in this industry and lack of exploitation of by-products.
- Output has been affected by shortages in service equipment and tools for cultivation and harvesting of cane as well as shortages in complementary agriculture inputs.
- Inappropriate cane varieties were used in production and inadequate water supply to the farms.
- Shortages of foreign exchange which contributed to shortfalls in fuel, spare parts, technicians and equipment.
- Working condition have led to the loss of staff and skilled worker. Performance is also impaired by inadequate managerial, financial and technical systems.
- High interest charges on accumulated debts and high variability of world sugar prices contributed significantly to the asymmetry between costs and revenues.

The Sugar Rehabilitation Project, funded by the world Bank and other financial institutions has contributed to the improvement in performance and the increase of capacity utilization as mentioned above, but the project is approaching its end by Mid 1992 and experiencing difficulties in handling the remaining volume of work within scheduled time frame due to shortage of funds and insufficient institutional capacity.

Consequently the Government has now requested further assistance to sustain performance improvement and optimizing utilization of capacity.

Sugar industry in Sudan is mainly using local raw material and is a good example of a successful import substitution industry by satisfying the local market, also has a good potential for the generation of investable surplus for export.

The environment in which the project will operate is presented in Annex IV.

B.2 Expected End-of-Project Situation

Based on the direct assistance that will be provided throughout the project to the four sugar estates and their holding Co. (SSPC). It is expected that the end of the project will reap benefits in the following form:

- Increased total capacity utilization of the SSPC.
- Improved productivity and profitability of the entire sugar production Co. due to the application of comprehensive cost accounting, payroll, and stock control system, which will provide a reliable management information system and will speed up management decisions and improve their control over the available resources.
- Improved performance of equipment and machinery due to improved maintenance management and the availability of trained "On-The-Job" maintenance technicians and engineers.
- Motivated employees at all levels due to the application of Incentive wage scheme based on actual workload.
- Management better knowledge of reorganization and restructuring as the only tool in today's world economy for survival, competition and profitability.

B.3 Target beneficiaries

- a) The Government and the sugar industry in Sudan. not only will benefit from the direct technical assistance, but also through the recommendations will be made concerning the macro and industrial sector level policy changes to foster the restructuring process.
- b) Rural population where the four sugar estates are located due to increased capacity utilization which will increase employment in all sectors of sugar industry, namely, factories and farms.

B.4 Project strategy and Institutional arrangement

Physical rehabilitation and financial restructuring of public enterprises have only succeeded where they were accompanied by policies requiring competitive performance and changes in the enterprises management, organization, technology and marketing. The need for such restructuring is crucial for a number of reasons. These include bad initial planning, changing market conditions, wrong management decisions, unfavorable Government policies, technological obsolescence of existing equipment and lack of service parts due to shortage of foreign exchange or the deterioration in the economic environment. UNIDO experience shows that restructuring at the firm level will not take place automatically in response to macroeconomic policy changes or rapid shift in the global conditions.

The Government need to establish policies that facilitate flexible resource movements in response to competition, promote institutions that are capable of filling information gap and capability gap and ensure that appropriate financing is available.

Policies and institutional programs can help scale down uncompetitive industries, reshape those that can be internationally competitive, and expand promising new activities.

Therefore, the project clearly illustrates the need for an efficient management system, supported by an appropriate incentive scheme and management information system, training programmes for staff tailored to the need of the industry, a careful financial analysis of the proposed major physical rehabilitation, an integrated cost accounting and financial system, and awareness of the environmental impact of the enterprise as well as of its overall socio-economic importance to the country, the specific feature of this approach on strategy is, however, that the accent is always on the more efficient utilization of existing industrial capacity rather than on new investment; the later should only come after every aspect of the former has been thoroughly examined.

B.4.1 Approach

The approach proposed for this project, consists of the following stages:

- Conducting a diagnostic of the four selected enterprises. This diagnostic will be carried out with regard to: management, personnel, financial situation, technology process, production facilities, products, services, markets and environment.
- The site survey is conducted as in-depth operational diagnostic of all functions performed by the enterprise. The objectives of the diagnostic are to determine whether the enterprise may be viable and to specify the main recommendations for rehabilitation.
- Preparing detailed medium-term recommendations for rehabilitation for each of the units and assess the necessary financial investment: and to provide direct advice.
- Introducing into practice a restructuring programme including:
 - . installation of computer software/hardware for cost accounting, general ledger, stock control, payroll;
 - . installation of computerized management information system;
 - . establishing of incentive wage scheme and new organization structure;
 - . establishing of maintenance management system;
 - . on-the-job training.

B.5 Reason for technical assistance from UNIDO

The Government of Sudan has began the process of implementing a privatization programme to many of the state-owned enterprises that are

inefficient and tie-up resources that could be more efficiently used in a market environment. But some of these public industrial enterprises will remain state-owned at least for the foreseeable future due to their strategic or social impact on the country. Therefore the Government has requested UNIDO assistance in a rehabilitation project for these enterprises to make them viable and competitive and/or salable in the future.

Technical assistance from UNIDO would, therefore provide the necessary resources to undertake the rehabilitation activities outlined in this project document.

B.6 Co-ordination arrangements

The project will maintain close liaison with the recently privatization programme of the country, which will provide this project with more information on other public enterprises that will remain state-owned and will be considered in the following phase of this rehabilitation project. Also the project will keep close co-ordination with the Sudan Sugar Rehabilitation Project (SSRP) financed by the World Bank, and its allocation of its remaining funds towards the physical rehabilitation of the four sugar estates.

C. DEVELOPMENT OBJECTIVE

To increase the share of the industrial sector in the recovery and revitalization of the national economy, as outlined in the Sudanese National Salvation Programme 1990- 1993. The project will contribute towards this goal through rehabilitation of the industrial enterprises that will remain state-owned for the foreseeable future in order to increase industrial output and employment, improving the trade balance and management performance.

D. IMMEDIATE OBJECTIVES, OUTPUTS AND ACTIVITIES

D.1 Immediate objective 1:

The objective of the project is the rehabilitation and restoration of the industrial enterprises that will remain state-owned with the frame work of the country's recent privatization programme. To achieve this objective UNIDO will extend its technical assistance services in the following areas:

- Upgrading and integrating the functions performed by the Sudanese Sugar Producing Company (SSPC) and its four Sugar Producing Units, namely, Guneid - Halfa- Sennar and Assalaya.
- Improving and rationalizing the manufacturing process and reducing costs.
- Training of Engineers and Technicians by means of: on- the-job training and/or training of the trainer or instructor.
- Addressing and analyzing the environment, the sector and the sub-sector which the company is operating.

The specific features of the implementation strategy, however, that the accent is always on the more efficient utilization of existing industrial capacity rather than new investment.

The Government of Sudan has specified the Sugar sub-sector for rehabilitation under this project for its strategic and socio-economic impact, and UNIDO accordingly has formulated this project document as the starting phase of the rehabilitation programme. Other phases of the project will follow based on more enterprises that will be identified as to remain state-owned for the foreseeable future, with the recent framework of the privatization programme.

D.1.1. Output (1)

Four diagnostic reports including diagnostic and rehabilitation plan one for each sugar estate audited.

Activities

D.1.1.1 Proceed with the external audit of the industrial sector/subsector, the environment in which the sugar estates operate. The consultancy team will adhere to special reports on industrial rehabilitation prepared by UNIDO and by other international agencies in Sudan.

D.1.1.2 Proceed with the internal audit of each sugar estate; the detailed audit will concentrate on each function of the enterprise e.g manufacturing management, finance and accounting, organization and human resources.

D.1.1.3 Assist all four estates in the specifications of equipment and parts needs as part of the assistance.

D.1.1.4 Establish the appropriate and realistic main recommendations for turnaround in the short and medium-term.

D.1.2 Output (2)

Introduce into practice a restructuring programme that will contribute to increasing total capacity utilization of the SSPC from 50% to 65% (30% increase), by improving and integrating the functions performed by the four production units and by improving their management performance during the first phase of the project (one year).

Activities

D.1.2.1* Installation of computer Software/Hardware and training of staff on using, modifying, and securing the database system, this include the following:

- Cost Accounting, Accounts Payable/Receivable and General Ledger.

- Payroll and Personnel.
- Stock control.

D.1.2.2* Installation of computerized management information system, Software/Hardware and staff training for the (SSPC) and, also assessing the viability of Networking with the four sugar production units.

* Subcontracting: Software design/tailoring Consulting Co.(See Annex III).

D.1.2.3 Establishing of Incentive Wage Scheme based on actual workload and measurements and training of production control department in using and modifying the system.

D.1.2.4 Establishing of new proposed organization structure based on optimum utilization of human resources and company integration.

D.1.2.5 Establishing of Maintenance Management System for factory equipment, agriculture equipment and Heavy/Light transportation Vehicles.

D.1.2.6 On-The-Job Training for Engineers and Technicians in the four production units to meet the special needs at various disciplines of the maintenance as follows:

- Electrical and Instrumentation.
- Boilers and steam generation (power plant).
- Hydraulic systems.
- Light/Heavy transportation vehicles.
- Factory and farm equipment
Tractors. Harvesters and loaders...etc.

D.1.3 Output(3)

Physical Rehabilitation - Appraisal presented in the form of a bankable project including all the relevant financial analysis to be used for negotiating the financing of the major financial inputs required for complete physical rehabilitation and upgrading.

Activities

D.1.3.1 Survey the agriculture requirements & costs:

- Agriculture Machinery
- Vehicles
- Workshops

D.1.3.2 Survey the irrigation requirements and costs:

- Field works
- Power generation

D.1.3.3 Survey factory requirements and costs:

- Process equipment
- Civil works
- Workshops

D.1.3.4 Survey infrastructure requirements and costs:

- Communications
- Electric equipment
- Building, Housing and Water

D.1.3.5 Survey support services requirement and costs:

- Office equipment
- Technical and management services

D.1.3.6 Project implementation workplan.

D.1.3.7 Implementation team and costs in detail.

D.1.3.8 Survey training required.

D.1.3.9 Finalize the appraisal document.

D.1.4 Output (4)

Project proposal for the National Sugar Training Center- Sennar (NSTC).

On the establishment of an integrated training capacity and mechanism at Sennar sugar Training Center by providing the training support Service, equipment and staff needed to make the Center a capable industrial training center rather than just a vocational training center.

Activities

D.1.4.1 Assessment of the NSTC objective, functions, capabilities, requirements and the potential for an effective role as industrial training center for the sugar industry.

D.1.4.2 Workplan for implementation.

D.1.4.3 Details of inputs, outputs, activities and costs.

E. INPUTS

E.1 Government Inputs

E.1.1 Assignment of National Staff

The Sudanese Sugar Production Company and the four sugar producing units will assign a full-time counterparts to the international Experts and consultants during their stay in the project.

E.1.2 Office Accommodation and assistance

The Sudanese Sugar Production Co. (SSPC) and the four sugar estates will provide suitable office accommodation, secretarial assistance as required and other standard office requirements.

E.1.3 Computer system hardware

The hardware required for the SSPC and the four sugar estates.

E.2 UNIDO INPUTS

Highly competent and motivated professionals with solid and relevant industrial development and business experience will be recruited internationally, these professionals will have a mix of experience in the technical economic and financial aspects of industrial enterprise operations in order for the project to achieve its objective.

For WORKPLAN See Annex (I)

For Job description see Annex (II)

For subcontracting Co. - Terms of reference see Annex (III)

POST	TITLE	M/M	RATE/M	TOTAL \$
11-01	Team leader- Industrial Engineer/ Industrial Economist	12	13,200	158,400
11-02	Accountant/ Industrial Financial Analyst	8	13,200	105,600
11-50	Short Term Consultant/ Maintenance Management	4	13,200	52,800
11-99	* Total International Experts	24	13,200	315,600
14-01	UNV Maintenance - Vehicles L/H (Tow x 4 Months)	8	3000	24,000
14-02	UNV Maintenance - Farm prep - Harvesters --- --	8	3000	24,000
14-03	UNV Maintenance - Elect/ Instrument --- --	8	3000	24,000
14-04	UNV Maintenance - Boilers - Steam --- --	8	3000	24,000
14-05	UNV Industrial/ Maint. Engineer	2	3000	6,000
14-99	* Total UNV's	34	3000	102,000
13-00	Clerk, Secretaries and Drivers	12		8,500
13-99	* Total Administrative	12		8,500
15-00	Project Travel			5,000
16-00	UNIDO Staff Mission (two)			15,000
	* Total UNIDO Travel			20,000
19-99	** Total Personnel Costs			447,500
21-00	Subcontract - International Firm (computerized Acct./ Financial System)			150,000
29-99	* Total Subcontract			150,000
41-00	Expendable Equipment			10,000
42-00	Non - Expendable Equipment Car Copying Machine Computer and printer			15,000 7,000 6,000
49-99	* Total Equipment			40,000
51-00	Miscellaneous			10,000
59-99	* Total Misc			10,000
99-99	Total Project Direct Costs			647,500

F- Risks

No matter how good the rehabilitation of an enterprise, the desired increase in capacity utilization, productivity and profitability will not be attainable if the appropriate, accompanying Government policies are not introduced.

To minimize the risk, the project also provides policy advice to the Government on national and sectoral restructuring.

Likewise with the industry inputs either to factory or to farms and agriculture needs, or to irrigation and water requirements, or to transportation and supporting services, if the inputs are short or not available or inadequate, no enterprise can function efficiently.

G- PRIOR OBLIGATIONS AND PREREQUISITES

The project does not stipulate any prior obligations. The only prerequisites are those listed under Government inputs as described in E.1.

H- PROJECT REVIEWS, REPORTING AND EVALUATION

A project terminal report will be prepared for consideration at the Review Meeting by the Team Leader of the project. It shall be prepared in draft sufficiently in advance to allow review and technical clearance by the Executing Agency at least 15 days prior to the last terminal review meeting.

I- BUDGETS

See attached.

3. COUNTRY SUDAN	4. PROJECT NUMBER AND AMENDMENT SUD 92 xxx	5. SPECIFIC ACTIVITY J. 12207
10. PROJECT TITLE REHABILITATION OF THE INDUSTRIAL ENTERPRISES (Phase I: Sugar sub-sector)		

15. INTERNATIONAL EXPERTS (functional titles required except for line 11-50)	16. TOTAL		17. 1992		18. 1993		19.		20.	
	M/M	\$	M/M	\$	M/M	\$	M/M	\$	M/M	\$
-11-01 CTA Industrial Engineer Economist	12	158.400	6	79.200	6	79.200				
02 Financial analyst	8	105.600	6	79.200	2	26.400				
03										
04										
05										
06										
07										
08										
09										
10										
11										
12										
13										
14										
15										
16										
11-50 Short term consultants	4	52.800	4	52.800						
11-99 Sub-total-International experts **	24	316.800	16	211.200	8	105.600				

21. REMARKS

** If more than 16 experts required check here and attach continuation sheet 1A. This sub-total must include all experts.

4. PROJECT NUMBER SUD 92 xxx	16. TOTAL		17. 1992		18. 1993		19.		20.	
	M/M	\$	M/M	\$	M/M	\$	M/M	\$	M/M	\$
OPAS EXPERTS (functional titles required)										
12-01										
12-02										
12-03										
12-99 Sub-total-OPAS experts **										
ADMINISTRATIVE SUPPORT PERSONNEL										
13-00 Clerks, secretaries, drivers		8.500		4.250		4.250				
13-50 Freelance interpreters (non-UNDP projects)										
13-99 Sub-total-administrative support personnel		8.500		4.250		4.250				
UN VOLUNTEERS (functional titles required)										
14-01 Maintenance Vehicles L/H	8	24.000	6	18.000	2	6.000				
14-02 " " Farm prep. Harvesters	8	24.000	6	18.000	2	6.000				
14-03 " " Electr./Instrument	8	24.000	6	18.000	2	6.000				
14-04 " " Boilers-Steam	8	24.000	6	18.000	2	6.000				
14-05 Industrial/maint. Engineer	2	6.000	2	6.000						
14-99 Sub-total-UN VOLUNTEERS **	34	102.000	26	78.000	8	24.000				
15-00 Project travel		5.000		2.500		2.500				
16-00 Other personnel costs (including UNIDO staff mission costs)		15.000		7.500		7.500				
NATIONAL EXPERTS (functional titles required)										
17-01										
17-02										
17-03										
17-04										
17-05										
17-99 Sub-total-National experts **										
18-00 Surrender prior years' obligations										
19-99 TOTAL-PERSONNEL COMPONENT	58	447.300	42	303.450	16	143.850				

** If additional individual budget lines are required, check here and attach continuation sheet 1A. These sub-totals must include budget lines listed on page 1A

4. PROJECT NUMBER SUD/92/xxx	16. TOTAL		17. 1992		18. 1993		19.		20.	
	M/M	\$	M/M	\$	M/M	\$	M/M	\$	M/M	\$
SUBCONTRACTS										
21-00 Subcontracts		150,000		75,000		75,000				
28-00 Surrender prior years' obligations										
29-00 TOTAL-SUBCONTRACTS		150,000		75,000		75,000				
TRAINING										
31-00 Individual fellowships										
32-00 Study tours; UNDP group training										
33-00 In-service training										
34-00 Non-UNDP group training										
35-00 Non-UNDP meetings										
38-00 Surrender prior years' obligations										
39-99 TOTAL-TRAINING COMPONENT										
EQUIPMENT										
41-00 Expendable equipment		10,000		10,000						
42-00 Non-expendable equipment		30,000		30,000						
43-00 Premises										
48-00 Surrender prior years' obligations										
49-99 TOTAL-EQUIPMENT COMPONENT		40,000		40,000						
MISCELLANEOUS										
51-00 Sundries		10,000		5,000		5,000				
55-00 Hospitality (non-UNDP projects)										
56-00 Support costs (CC and DC projects only)										
58-00 Surrender prior years' obligations										
59-99 TOTAL-MISCELLANEOUS COMPONENT		10,000		5,000		5,000				
99-99 PROJECT TOTAL	58	647,300	42	423,450	16	223,850				

Workplan

The preliminary workplan as illustrated by the following Gantt chart, shows the timing of the project activities as described under D.1.1. D.1.2, D.1.3 and D.1.4 of this document.

Detailed workplans for use in the management and operations of the project will be prepared in three months intervals during scheduling review by the project steering committee.

ANNEX II

JOB DESCRIPTIONS

OF

CORE STAFF

UNIDO

PROJECT OF THE REPUBLIC OF SUDAN

JOB DESCRIPTION

Post title : Team Leader/Expert-Industrial rehabilitation and restructuring

Duration : One year

Date required : As soon as possible

Duty station : Khartoum, Sudan

Purpose of project: The development objective of the project is to increase the share of the industrial sector in the revitalization of the national economy, and the project will contribute towards this goal through rehabilitating of the industrial enterprises that will remain state - owned for the foreseeable future in order to increase industrial output and employment, improving trade balance through the increase of capacity utilization, improving of productivity and management performance.

Duties : The expert will be the UNIDO team Leader of a team of international experts and UN volunteers as follows:

- Expert in Integrating Accounting and Financial System Analysis.
 - Short term consultant for Maintenance Management.
 - Nine (9) UN volunteers mainly for the extension of on-the-job training on different disciplines of maintenance.
 - Subcontracting company for system design, installation, training and implementation. The team leader will be expected to undertake the following activities.
- 1- Prepare an appraisal report for the required physical rehabilitation based on diagnostic study and findings with the assistance of one NV/Industrial Engineer.

- 2- Preparation of project proposal for the National Sugar Training Center (NSTC) in Sennar, on the establishment of an integrated training capacity and mechanism i.e. administration, training and support personnel and facilities, to make the center a capable industrial training center rather than just a vocational training facility.
- 3- Analyze the industrial sub-sector in which the production units are operating (The external factor), the macro economic policy changes and the impact on the enterprise autonomy and performance.

Qualifications: University advanced degree in Industrial Engineering and project management/Industrial Economist, with long standing experience in industrial development, performance improvement and restructuring. International consultancy services and experience in developing countries is desirable.

Languages : English; knowledge of Arabic is highly desirable.

UNIDO

PROJECT OF THE REPUBLIC OF SUDAN

JOB DESCRIPTION

Post title : Expert-Integrated accounting and Financial System Analyst.

Duration : 8 Months with possibility of extension.

Date required: As soon as possible

Duty station : Two months in each of the four sugar estates i.e Guneid, Sennar, Halfa, Assalaya/Sudan.

Purpose of project: The development objective of the project is to increase the share of the industrial sector in the revitalization of the national economy, and the project will contribute towards this goal through rehabilitating of the industrial enterprises that will remain state-owned for the foreseeable future in order to increase industrial output and employment, improving trade balance through the increase of capacity utilization, improving of productivity and management performance.

Duties:

- 1- Conduct in-depth diagnostic for the application of computerized Integrated Accounting and Financial system, mainly include: Accounts Payable, Accounts Receivable, Stock Control and General Ledger, and specify system requirements, software and hardware for subcontracting.
- 2- Conduct in-depth diagnostic for organization structure, functions performed, staff requirements, annual direct and indirect costs, profit and loss cost centers, projected profit and loss statement and identify the main problems for sub-optimal performance.
- 3- Establish new proposed organization structure based on the optimum utilization of human resources and company integration. Specify functions and responsibilities and allocation of human resources.

4- Establish an Incentive compensation scheme, based on actual workload analysis and work measurement technique and train production control division on the implementation and development of the system.

Qualifications: Advanced University degree in Accounting/Finance and Business Administration with extensive experience at senior management level and computerized system application. Experience in consultancy business and industrial restructuring in developing countries, would be an asset.

Languages : English; knowledge of Arabic is highly desirable.

UNIDO

PROJECT OF THE REPUBLIC OF SUDAN

JOB DESCRIPTION

Post title : Short term consultant-Maintenance Management.

Duration : 4 Months.

Date required : As soon as possible.

Duty station : One month in each location of the four sugar estates, namely, Guneid, Sennar, Assalaya, Halfa/Sudan.

Purpose of project: The development objective of the project is to increase the share of the industrial sector in the revitalization of the national economy, and the project will contribute towards this goal through rehabilitating of the industrial enterprises that will remain state-owned for the foreseeable future in order to increase industrial output and employment, improving trade balance through the increase of capacity utilization, improving of productivity and management performance.

Duties :
1- Establishment of Maintenance Management System for the four sugar estates, this include, factory equipment, farm equipment, Heavy/Light transportation vehicles and infrastructure.
2- Supervision of (8) UN Volunteers and monitor their activities.
3- Plan, organize and conduct appropriate workshops or seminars that will focus on: Maintenance Management System, methods, techniques and implementation.
4- Travel between the four sugar estates as required.

Qualifications : University degree in Engineering preferably in Industrial or Mechanical Engineering. Experience in all aspects of maintenance management systems design and implementation. Consultancy experience in developing countries would be an advantage.

Languages : English; Knowledge of Arabic would be an asset.

UNIDO

PROJECT OF THE REPUBLIC OF SUDAN

JOB DESCRIPTION

- Post title : UN volunteer, Physical Rehabilitation, Mechanical and Electrical
- Duration : 2 Months.
- Date required : As soon as possible.
- Duty station : Travel between the four sugar production estates (Guneid, Sennar, Assalaya, Halfa)-Sudan.
- Purpose of project : The development objective of the project is to increase the share of the industrial sector in the revitalization of the national economy, and the project will contribute towards this goal through rehabilitating of the industrial enterprises that will remain state-owned for the foreseeable future in order to increase industrial output and employment, improving trade balance through the increase of capacity utilization, improving of productivity and management performance.
- Duties : The selected candidates will have the responsibility of surveying all the requirements for complete physical rehabilitation in each of the four sugar estates. Also specify all the technical specifications for parts and equipment required with quantities and costs. This survey will include the following:
- 1- Survey the factory requirements and costs:
 - Process equipments
 - Civil works
 - Workshops
 - 2- Survey the agriculture requirements and costs:
 - Agriculture machinery
 - Vehicles
 - Workshops

- 3- Survey the irrigation requirements and costs:
Field works
Power generation
- 4- Survey infrastructure requirements and costs:
Communications
Electric equipment
Building, housing & water
- 5- Survey support services requirements and costs:
Office equipment
Technical & management
Services
- 6- Prepare cost analysis study based on the ROI due to the increase in capacity utilization and productivity, and the feasibility of the physical rehabilitation project.

Qualifications : University degree in Mechanical/Industrial Engineering with extensive experience on physical rehabilitation and upgrading, and the preparation of feasibility studies. Experience in sugar production facility would be an asset.

Languages : English; knowledge of Arabic is highly desirable.

UNIDO

PROJECT OF THE REPUBLIC OF SUDAN

JOB DESCRIPTION

Post title : UN Volunteer,
Physical Rehabilitation and Maintenance of
Electrical Equipment and Instrumentation.

Duration : Four (4) Months (2 Vacancies)

Date Required : As soon as possible.

Duty Station : Sennar/Assalaya or Guneid/Halfa
Sudan.

Purpose of project: The development objective of the project is to increase the share of the industrial sector in the revitalization of the national economy, and the project will contribute towards this goal through rehabilitating of the industrial enterprises that will remain state-owned for the foreseeable future in order to increase industrial output and employment, improving trade balance through the increase of capacity utilization, improving of productivity and management performance.

Duties : 1- On-The-Job Training of maintenance staff and engineers (counterparts) on how to operate, inspect and maintain electrical equipment and instrumentation of the process industry and capital intensive installation.

2- Preparation of preventive maintenance programme.

3- Travel as required between two sugar production estates.

Qualifications : - Professional education at graduate level in Electrical/Instrumentation Engineering, familiarity with mechanical engineering would be an advantage.

- Training methodology and techniques.

- Experience in the sugar industry and the development of PM programmes would be a plus.

Language : Arabic; and working knowledge of English is required.

UNIDO

PROJECT OF THE REPUBLIC OF SUDAN

JOB DESCRIPTION

- Post title : UN Volunteer,
Physical Rehabilitation and Maintenance of
Harvesters, Farm preparation and Earth
moving equipment.
- Duration : Four (4) Months (2 Vacancies)
- Date Required : As soon as possible.
- Duty station : Sennar/Assalaya or Guneid/Halfa
Sudan
- Purpose of project : The development objective of the project
is to increase the share of the industrial
sector in the revitalization of the
national economy, and the project will
contribute towards this goal through
rehabilitating of the industrial
enterprises that will remain state-owned
for the foreseeable future in order to
increase industrial output and employment,
improving trade balance through the
increase of capacity utilization,
improving of productivity and management
performance.
- Duties : 1- On-The-Job Training of maintenance
staff and Engineers (counterparts) on
how to operate, inspect and maintain
agriculture and farm preparation
equipment, sugar cane harvesters,
loaders and earth moving equipment.
- 2- Preparation of preventive maintenance
programme.
- 3- Travel as required between two sugar
production estates.

- Qualifications : - An appropriate Mechanical/Automotive Engineering technical qualifications at diploma or degree level. Should be an able Master Mechanic, with Hands-On-Experience, also able to handle normal auto-electric and hydraulic problems.
- Experience in the sugar industry preferable.
- Experience in developing PM programmes and training methodology in the developing countries is an assets.
- Languages : Arabic; and working knowledge of English is required.

UNIDO

PROJECT OF THE REPUBLIC OF SUDAN

JOB DESCRIPTION

Post title : UN Volunteer,
Physical Rehabilitation and Maintenance of
Light and Heavy Duty Vehicles.

Duration : Four (4) Months (2 Vacancies)

Date required : As soon as possible.

Duty station : Sennar/Assalaya or Guneid/Halfa
Sudan.

Purpose of project : The development objective of the project
is to increase the share of the industrial
sector in the revitalization of the
national economy, and the project will
contribute towards this goal through
rehabilitating of the industrial
enterprises that will remain state-owned
for the foreseeable future in order to
increase industrial output and employment,
improving trade balance through the
increase of capacity utilization,
improving of productivity and management
performance.

Duties : 1- On-The-Job Training of maintenance
staff and Engineers (counterparts) on
how to operate, inspect and maintain
Light and heavy duty vehicles.

2- Introduction of PM programme.

3- Travel as required between two sugar
production estates.

Qualifications : An appropriate Automotive Engineering
technical qualifications at diploma or
degree level. Should be an able Master
Mechanic, with Hands-On-Experience, also
able to handle normal auto-electric
problems.

Languages : Arabic; working knowledge of English is
required

UNIDO

PROJECT OF THE REPUBLIC OF SUDAN

JOB DESCRIPTION

- Post title : UN Volunteer,
Physical Rehabilitation and Maintenance of
steam power plant.
- Duration : Four (4) Months (2 Vacancies)
- Duty Station : Sennar/Assalaya or Guneid/Halfa
Sudan.
- Purpose of project : The development objective of the project
is to increase the share of the industrial
sector in the revitalization of the
national economy, and the project will
contribute towards this goal through
rehabilitating of the industrial
enterprises that will remain state-owned
for the foreseeable future in order to
increase industrial output and employment,
improving trade balance through the
increase of capacity utilization,
improving of productivity and management
performance.
- Duties : 1- On-The-Job Training of maintenance
staff and Engineers on how to
properly operate, inspect and
maintain the steam generating
equipment, Boilers, attachments and
turbines.
2- Introduction of PM and programme to
control the regular maintenance
procedures and frequencies.
3- Travel between 2 sugar precaution
estates.
- Qualifications : - An appropriate steam Engineering
technical qualifications at diploma
or degree level.
- At least ten (10) years working
experience in steam power plant.
- License of steam power plant Engineer
preferable.
- Language : Arabic; working knowledge of English is
required.

TERMS OF REFERENCES

ESTABLISHMENT OF AN INTEGRATED ACCOUNTING/FINANCIAL
SYSTEM BY AN INTERNATIONAL COMPANY1) Aim of the subcontract:

The objective is to design, install and implement an integrated computerized accounting/financial system to effectively control the operations of each of the four sugar estates, this including: cost accounting, accounts payable, accounts receivable, general ledger payroll, and stock control.

2) Scope of contracting services:

The subcontractor will carry out the following:

- a) Review the existing organizational structure, nature of processing involved, type and volume of activities, and recommend the most appropriate organizational structure that is suited for the introduction of the proposed system:
- b) Review existing manual and/or semi computerized systems, also review the existing chart of accounts with a view to assess its appropriateness for an integrated accounting system and recommend changes if desirable:
- c) Evaluate the existing policies and practices of management control systems and reporting formats that relate to the proposed integrated functions:
- d) Establish both direct and indirect cost distribution parameters:
- e) Design unit cost computation mechanism:
- f) Identify cost centers classifications and design reporting formats:
- g) Establish standards required for effective running of process cost accounting system:
- h) Establish standards required for effective running of payable, receivable general ledger and payroll systems:
- i) Establish standards required for effective running of stock control/accounting system:
- j) Design, install and implement the proposed computerized system:
- k) Train local staff in using the system effectively:
- l) Prepare system manual and procedures to be used by local personnel:
- m) Indicate the level of qualifications, experience and further training needed to maintain the installed system.

3) Reports:

- Submit an interim progress report on the status every two months.
- Submit a draft final report on the entire project with the proposed system and procedures manual within 3/4 months from the date of signing of the related agreement in 7 copies.
- Submit a final report with any modifications in 10 copies.

4) Qualifications:

The subcontractor shall assign the necessary personnel with qualifications and experience commensurate with their assignments. The firm also should have reputable experience in installing and implementing accounting/financial systems software/hardware and local area network.

5) Date required: As soon as possible

6) Duration: 5-6 months

7) Duty station: Guneid, Sennar, Assalaya, Halfa and Khartoum

8) Languages: Both English and Arabic

The environment in which the project will operate

It should be pointed out that, due to the very short time available for visits and discussions with the management of the enterprises visited, the views expressed here should be regarded with caution. A truly clear picture can be only formed through detailed diagnostic analysis of the operations of each enterprise (Factory & Farm). Nevertheless, the comments made here could be useful to establish priorities to which operation should be scrutinized in greater detail.

General Impression (Visit to Guneid & Sennar)

- Capital intensive equipment. Capacity utilization relatively low for variety of reasons. In several instances maintenance problems were mentioned either because of lack of spare parts, or because the specific maintenance expertise was not available.

- Profitability was reported to be generally low and losses were incurred due to low capacity utilization and pricing policies, generally speaking the production units are rarely in a position to recoup the full cost of production.

- Output has been affected by shortage in service equipment and tools for cultivation and harvesting of cane as well as shortages in complementary agriculture inputs.

- Shortages of foreign exchange have contributed to shortfalls in fuel, spare parts, technicians and equipment.

- Working condition have led to the loss of staff and skilled worker. Performance is also impaired by inadequate managerial, financial and technical systems.

- There are four main components that need attention:
 - 1- Physical rehabilitation.
 - 2- Measures to insure production inputs.
 - 3- Improvement of management performance, and engineers & technicians effectiveness.
 - 4- Organizational and financial restructuring in each estate, and effective institutional arrangement between the four estates, and their holding company.

- Statistics and analysis for the four sugar producing estates are attached

BASIC DATA

FACTORY	START	CULTIVATED AREA IN 1000 ACRES	PROD CAPACITY IN 1000 TON		LABOUR		
			Design	Available	Permanent	Seasonal	Total
Guneid	62/63	37.5	60	60	1677	2975	4652
Halfa	65/66	37.0	75	75	2883	3400	6283
Sennar	76/77	31.0	110	80	2184	7850	10034
Assalaya	79/80	28.0	110	50	1790	5700	7490
Total		133.5	355	265	8534	19925	28459

SUDANESE SUGAR PRODUCTION CO.

SUGAR PRODUCTION 1981/82 - 90/91 IN 1000 TONS

<i>YEAR</i>	<i>GUNIED</i>	<i>N. HALFA</i>	<i>SENNAR</i>	<i>ASSALAYA</i>	<i>TOTAL</i>
81/1982	15.7	35.8	21.6	----	73.1
82/1983	20.8	37.7	41.3	31.6	131.4
83/1984	22.7	47.9	57.7	41.4	169.7
84/1985	14.9	61.20	68.9	47.3	192.3
85/1986	25.2	53.7	37.6	42.3	158.8
86/1987	28.9	48.8	47.8	46.7	172.2
87/1988	27.0	42.6	42.2	30.1	143.9
88/1989	22.6	28.7	44.1	26	121.4
89/1990	34.4	36.6	50.7	33.3	155.0
90/1991	40.2	43.8	58.8	37.6	180.4

3-YEARS PROJECTED CANE AND SUGAR PRODUCTION

FOR THE FOUR SUGAR COMPANIES

(1990/91 - 1992/93)

FACTORY	YEAR	HARVEST AREA (000) FED.	AVERAGE YIELD T/F	CANE PRODUCTION % CANE	SUGAR RECOVERY % CANE	SUGAR PRODUCTION (000) TONS	AVERAGE OURSHING RATE	SEASON DAYS
Quneid	90/91	18.0	26.0	470	9.0	42.3	2500	188
	91/92	19.5	27.0	530	9.3	49.3	2700	196
	92/93	20.0	30.0	600	9.5	57.0	2900	207
N-Halfa	90/91	18.0	29.5	530	9.0	47.7	2700	196
	91/92	20.0	32.0	640	9.3	59.5	2900	220
	92/93	21.0	33.0	690	9.7	65.0	3100	223
Sennar	90/91	22.5	28.5	640	9.0	57.6	3500	183
	91/92	21.7	32.0	690	9.2	63.5	3700	187
	92/93	24.5	34.5	850	9.3	79.0	3900	218
Assalaya	90/91	16.5	24.0	400	9.8	39.2	3100	129
	91/92	18.0	27.0	490	9.9	48.5	3200	153
	92/93	18.0	30.0	540	9.9	53.5	3300	164
Total	90/91	75.0	27.2	2040	9.2	186.8	2.9	696
	91/92	79.2	29.7	2350	9.4	220.8	3.1	756
	92/93	83.5	32.1	2680	9.5	254.5	3.3	812

**THE REVISED 3-YEARS PROJECTED CANE AND SUGAR PRODUCTION
FOR THE FOUR SUGAR COMPANIES
(1990/91 - 1992/93)**

FACTORY	YEAR	HARVEST AREA (000) FED.	AVERAGE YIELD T/F	CANE PRODUCTION (000) Tons	SUGAR RECOVERY % CANE	SUGAR PRODUCTION (000) TONS	AVERAGE OURSHING RATE	SEASON DAYS
Quneid	90/91	17.80	23.90	424.50	9.47	40.21	2,400.00	177.00
	91/92	20.01	24.16	483.60	9.70	46.91	2,500.00	193.00
	92/93	20.00	26.11	522.15	10.00	52.22	2,600.00	201.00
New Halfa	90/91	18.80	22.97	431.98	10.14	43.79	2,900.00	147.00
	91/92	21.30	25.00	530.00	10.00	53.00	3,000.00	175.00
	92/93	22.00	27.00	600.00	10.00	60.00	3,300.00	180.00
Sennar	90/91	22.14	28.30	626.50	9.38	58.79	3,742.00	168.00
	91/92	22.00	29.50	649.00	9.40	61.01	3,750.00	173.00
	92/93	22.00	31.00	682.00	9.75	66.50	4,000.00	171.00
Assalaya	90/91	17.16	22.35	382.06	9.87	37.73	2,894.00	132.00
	91/92	18.31	24.50	448.00	10.00	44.80	3,000.00	150.00
	92/93	19.20	26.60	510.00	10.00	51.00	3,200.00	156.00
Total	90/91	75.90	24.38	1,865.04	9.72	180.52	2,984.00	624.00
	91/92	81.62	25.79	2,110.60	9.78	205.72	3,062.50	691.00
	92/93	83.20	27.68	2,314.15	9.94	229.72	3,275.00	708.00

FACTORY SPARES: AGRICULTURAL MACHINERIES & EQUIPMENTS
SPARES COST ESTIMATION TABLES

BASIS: S 25 Per ton of sugar produced for factory spares

S 15 Per ton of sugar produced for agriculture W/S spares

<i>FACTORY</i>	<i>YEAR</i>	<i>TOTAL SUGAR PRODUCTION (000. TON)</i>	<i>FACTORY SPARE PARTS TOTAL EXPENDITURE \$ (000)</i>	<i>AGRICULTURE SPARES TOTAL EXPENDITURE \$ (000)</i>	<i>TOTAL</i>
Guncid	90/91	42.3	1057.5	634.5	1692.0
	91/92	49.3	1232.5	739.5	1972.0
	92/93	57.0	1425.0	855.0	2280.0
M. Halfa	90/91	47.7	1192.5	715.5	1908.0
	91/92	59.5	1487.5	892.5	2380.0
	92/93	65.0	1625.0	975.0	2600.0
Sennar	90/91	57.6	1440.0	864.0	2304.0
	91/92	63.5	1589.5	952.5	2542.0
	92/93	79.0	1975.0	1185.0	3160.0
Assalaya	90/91	93.2	980.0	588.0	1568.0
	91/92	48.2	1212.5	723.0	1935.5
	92/93	53.5	1337.5	802.5	2140.0
Total	90/91	186.8	4670.0	2802.0	7472.0
	91/92	220.5	5522.0	3307.5	8829.0
	92/93	254.5	6362.5	3817.5	10180.0

SUGAR PER FEDDAN

<i>SEASON</i>	<i>GUNIED</i>	<i>HALFA</i>	<i>SENNAR</i>	<i>ASSALAYA</i>	<i>AVERAGE</i>
88-89	1.60	1.95	2.25	1.74	1.89
89-90	2.04	2.22	2.33	2.09	2.17
90-91	2.26	2.33	2.66	2.19	2.36
91-92	2.32	2.49	2.77	2.45	2.51

AREA HARVESTED (FEDDAN)

<i>SEASON</i>	<i>GUNIED</i>	<i>HALFA</i>	<i>SENNAR</i>	<i>ASSALAYA</i>	<i>TOTAL</i>
88-89	14131.00	14710.00	19650.00	14963.82	63454.82
89-90	16839.00	16551.00	21778.00	16006.23	71174.23
90-91	17757.00	18800.00	22135.00	17166.00	75858.00
91-92	20128.50	21254.00	22000.00	18311.00	81693.50

CANE HARVESTED (T)

<i>SEASON</i>	<i>GUNIED</i>	<i>HALFA</i>	<i>SENNAR</i>	<i>ASSALAYA</i>	<i>TOTAL</i>
88-89	263922.13	387850.60	536004.14	274838.00	1462614.87
89-90	340087.14	389952.50	553398.27	322145.00	1605582.91
90-91	424460.86	431983.20	626503.20	382058.00	1865005.26
91-92	484500.00	530000.00	649000.00	448000.00	2111500.00

SUGAR RECOVERY

<i>SEASON</i>	<i>GUNIED</i>	<i>HALFA</i>	<i>SENNAR</i>	<i>ASSALAYA</i>	<i>AVERAGE</i>
88-89	8.59	7.40	8.23	9.52	8.44
89-90	10.12	9.42	9.15	10.36	9.76
90-91	9.47	10.14	9.38	9.87	9.72
91-92	9.70	10.00	9.40	10.00	9.78

SUGAR PRODUCTION (T)

<i>SEASON</i>	<i>GUNIED</i>	<i>HALFA</i>	<i>SENNAR</i>	<i>ASSALAYA</i>	<i>TOTAL</i>
88-89	22673.80	28696.80	44115.00	26106.80	121592.40
89-90	34412.50	36722.90	50660.00	33379.00	155174.40
90-91	40207.00	43792.50	58788.80	37646.20	180434.50
91-92	46700.00	53000.00	61000.00	44800.00	205500.00

CANE YIELD (T/F)

<i>SEASON</i>	<i>GUNIED</i>	<i>HALFA</i>	<i>SENNAR</i>	<i>ASSALAYA</i>
88-89	18.68	26.37	27.28	18.37
89-90	20.36	23.56	25.41	20.13
90-91	23.90	22.97	28.30	22.26
91-92	24.16	25.00	29.50	24.50