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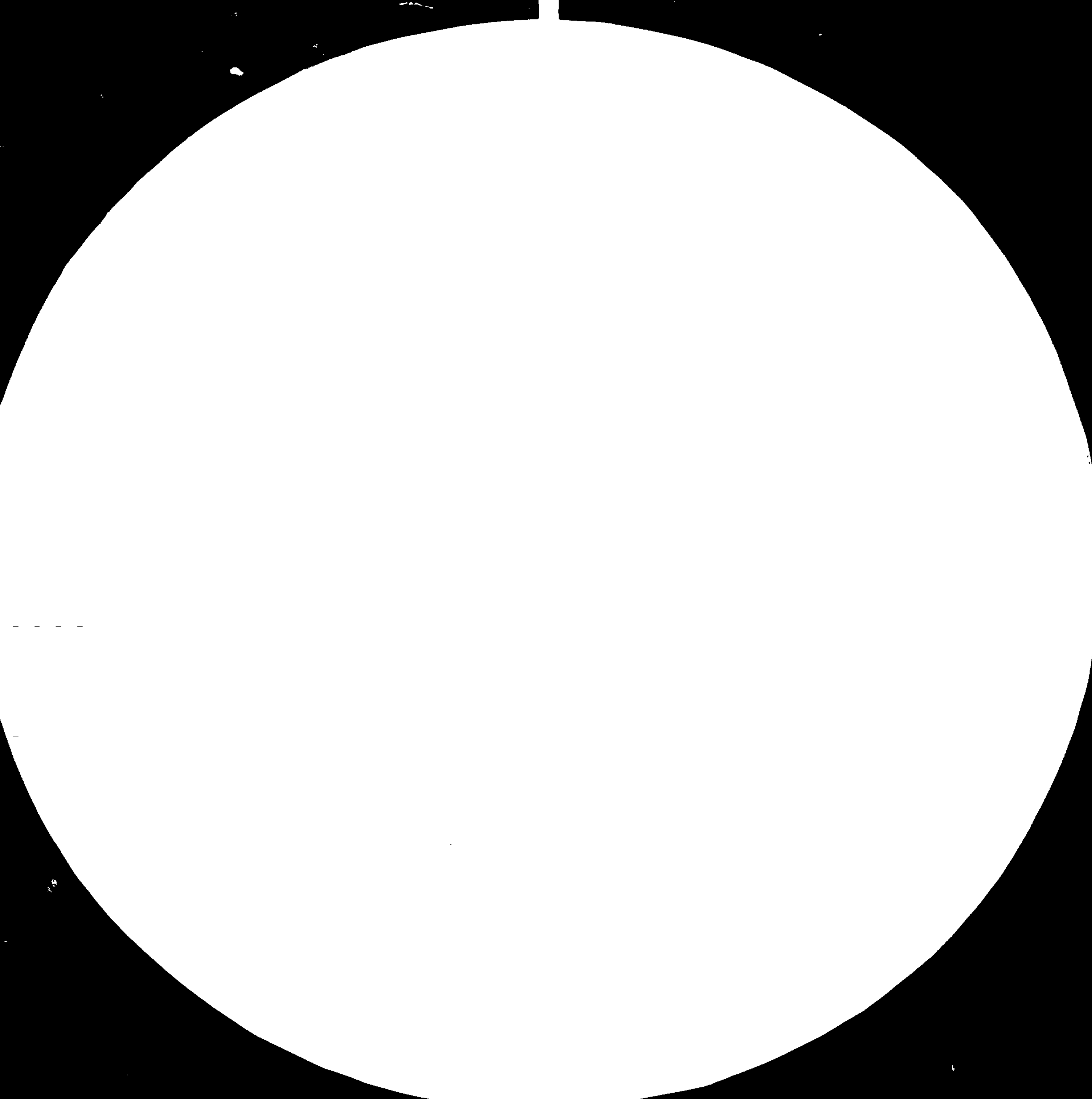

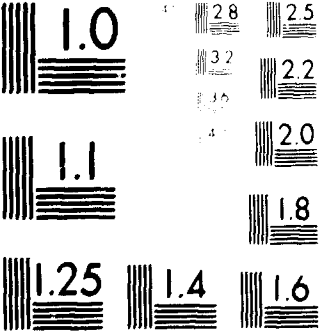

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(R STUDY TO IDENTIFY TECHNICAL ASSISTANCE REQUIREMENTS FOR THE SUGAR INDUSTRY IN UGANDA *

RP/UGA/78/003

UGANDA

Terminal report

Prepared for the Government of Uganda
by the United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of A. Elgaish,
expert in sugar technology

United Nations Industrial Development Organization
Vienna

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SUMMARY

Until 1972 the cane sugar industry in Uganda was one of the country's important industries. It consisted of three factories (sugar estates) with a total annual production of 138,000 to 148,000 tonnes of sugar. For various reasons, the production has been considerably reduced since that time. In order to identify the basic problems, a sugar technologist visited the country in February/March 1979 and made a general assessment of the technical, organizational and managerial operation of this industry. Originally, it was envisaged that the establishment of an institution to carry out research and development activities and deal with the technical problems of the sugar industry might be advisable. However, it was found that the problems are primarily of managerial, administrative and financial nature which should be dealt with first.

It is recommended to consider the possibility of running sugar estates by a reputable organization or company through a management contract. Also, assistance of a team of sugar experts through periodic visits for the next three years, and training of chemists and engineers in sugar technology, has been recommended.

INTRODUCTION

The sugar industry represents a priority sector in the country's economy. However, the sugar production has decreased from 140,000 tonnes in 1969 to less than 30,000 tonnes in 1976/1977 season. The primary objective is to revitalize this important sector of industry in order to reach a sufficient production level of sugar for the domestic market and possibly for export.

A very comprehensive report on this sector of industry was prepared by the East African Development Bank in 1974 and this served as a basis for bilateral negotiations on the rehabilitation programme. A UNIDO programming mission for the industrial sector in the country, undertaken in November 1975, identified the basic problems in the sugar industry. The proposed assistance, however, was primarily related to the training of technical personnel in the existing sugar plants.

The sugar industry consisted basically of four sugar estates (Kakira, Lugazi, Sango Bay and Kinyala) of which Kakira and Lugazi have very old sugar mills operating at a reduced capacity (Kakira was established in 1918). Of the other two newer plants, one is staying idle and the other was expected to be put into operation sometime ago. A shortage of trained key personnel, old equipment with too frequent stoppages, problems in obtaining adequate sulphur and lime, irregular supply of cane, inefficient organization of production, etc. are some of the indicated problems which have reduced the efficiency of the sugar production.

At the time this technical assistance project was formulated, it was considered that a kind of sugar industry development centre should be established to take over certain technical responsibility for the whole sugar industry and to assist individual plants in various matters. It was envisaged that the basic activities of the centre may be related to: advisory services on all organizational, technical, technological and economic aspects; direct intervention (trouble shooting); planning overall development of the sugar industry; inventory of equipment and spare parts; increasing the efficiency of operation; diversified utilization of by-products; carrying out applied research; servicing the industry in various testing and control; training of technical personnel and organize various courses. Based on this, a cane sugar industry technologist was expected to: review the available documentation related to the existing sugar industry; make a general assessment of technical and operational condition of the existing plants; based on his assessment, recommend the action to be taken and formulate a project for the establishment of a sugar industry development centre. It appeared however, that the present condition of the sugar industry is such that an urgent action is required in order to improve day-to-day operation of individual plants. The establishment of the centre was found to be premature at this stage and the proposed technical assistance relates primarily to the expert services and training of key personnel of individual plants.

Until 1972 the sugar industry consisted of three sugar plants (sugar estates):

- KAKIRA with annual production of sugar of 80,000 - 85,000 tonnes
- LUGAZI with annual production of sugar of 53,000 - 57,000 tonnes
- SANGO BAY with annual production of sugar of 5,000 - 6,000 tonnes.

They were all owned and operated by expatriates who had to leave the country in 1972. Due to this, and general economic situation in the country, the sugar production gradually decreased and in 1978, KAKIRA estate produced only 5,000 tonnes of sugar, and LUGAZI less than one tonne. SANGO BAY, which was newly commissioned in 1968 stopped its operation in 1975 as a result of an accident that damaged the rotor of the power turbine. Since it is located in a conflict area, it has never been brought up to the normal operational condition.

KINYALA (sugar estate) plant was commissioned in 1976 however, it is working with only 11 per cent of its capacity.

FINDINGS

Kakira Sugar Estate

The estate started operation in 1918 and the sugar mill in 1930 with a processing capacity of 200 T.C.D. It was expanded in 1937 to 1,000 T.C.D. and renewed and expanded again in 1967 to 3,000 T.C.D. With its 19,500 acres plantation and out-growers, the plant should have sufficient supply of cane to run at its full capacity.

The location of the plant is quite good, it is almost 15 km far from Jinja, the second largest town in Uganda. Jinja is an important industrial centre with other industries as well, such as oil and soap, textile, cigarettes, etc. There is a fairly nice and adequate housing for staff and skilled labour, of both the factory and plantation, very good living facilities and recreation centres. The infrastructure is adequate and transport is easy via tar roads.

Attached to the factory is a workshop with the necessary facilities for maintenance and an even production of simple spare parts.

During the period of 1967-1971, the annual production was almost steady at the level of 80,000 to 83,000 tonnes of sugar, with acceptable variations due to changes in cane characteristics and climate conditions.

Up to the end of 1971, there were 156 expatriates working in the factory and plantation and holding managerial, senior, technical and key jobs, without local counterparts. After the new regulations were imposed in 1972 and expatriates left the country, the production gradually decreased for various reasons to the level of only 5 per cent of its normal attainable capacity. Some 80 per cent of the down time is due to lack of cane supply and not to defective equipment. The plant is now running at a net loss.

In March 1976, an Italian company was contracted to provide engineering and technical know-how, assistance and training facilities, and to rehabilitate the plant to its original capacity of 3,000 T.C.D. and partly to 5,000 T.C.D. Due to the financial problems, the provision of material and personnel was behind schedule. The main problem of the plant appeared to be in the field, such as cane cutting and hauling, which has not been solved at the time of the consultant's visit.

Lugazi Sugar Estate

The Lugazi plant was established in 1930 with a daily capacity of 500 T.C.D. and was subsequently expanded and renewed in 1949 to a crushing capacity of 2,500 T.C.D. With an estate of 25,000 acres and out-growers, it is possible to provide cane for the plant to operate at full capacity. Its location appears to be very good, only 45 km. from Kampala, the capital of the country. Both road and railway communications are very good. The estate has fairly nice and adequate housing system to accommodate the staff and skilled labour for both the plant and plantation. There are excellent living facilities and recreation centres.

Attached to the factory is a large workshop, sufficiently equipped for regular maintenance of the plant and an even production of non- to semi- sophisticated spare parts. With its extra capacity the workshop is able to serve other customers as well and thus bring an extra income to the company.

Until 1972, the plant was well maintained and run and its production was almost steady, at 53,000 to 55,000 tonnes of sugar per year (1967-1971) with acceptable variations due to the normal effect of the climate and rainfall on the growth and maturity of the sugar cane.

Up to the end of 1971, the number of expatriates working in the factory was approximately about 160. They occupied managerial, senior and technical jobs with no real Ugandan counterparts. Due to new regulations imposed in the country in 1972, all expatriates left Uganda and the production gradually decreased for various reasons. As it is evident from the production figures, the actual production diminished to only two per cent of its normal attainable capacity. More than 80 per cent of the factory's down time is caused by the lack of cane supply and not to the failure in mechanical operations of equipment. The plant is now running at a net loss.

According to the contract with an Indian company, the plant was expected to be rehabilitated in order to produce 36,000 tonnes of sugar per year. The contract was expected to be implemented within the period of 18 months, ending in October 1980 pending on payments in due time. It appears however, that the problem of cane supply as the main reason for low production, has remained unsolved.

Kinyala Sugar Estate

The Kinyala sugar plant is the newest in the country. It was commissioned in July 1976. The plant's capacity is 1,500 T.C.D. with possible expansion to 2,500 T.C.D. The normal attainable capacity is approximately 36,000 tonnes of sugar per year. The estate with 9,338 acres of plantation and additional outgrowers, can provide an adequate supply of cane.

Although the plant is located in a remote and less populated area, with the purpose of regional development, the climatic condition and nature of land are favourable for cane growing. It is about 230 km. from Kampala and about 20 km. away from the nearest small city (Masindi) with which it is connected by a dusty road. It is connected to Kampala by 50 km. of dusty and the rest of paved (tar covered) road.

Since the plant is rather new, the system of housing is not yet complete to enable accommodation for all staff and technical labour for both the plant and plantation. Also, there is a shortage of camps for seasonal cane cutters. Living and transportation facilities are of a very low level, there are no recreation centres. For this reason, the turnover of the technical staff is very high and recruitment is in general very difficult. The percentage of absentees is also high resulting in a shortage of manpower.

As the factory is new, a management contract was signed with an Indian company specialized in the organization and operation of the sugar industry. According to the contract, 52 expatriates are expected to be employed to occupy the main technical and managerial posts according to the following programme:

1st Year:

5 of managerial level including factory manager
13 superintendents, specialists and shift supervisors
13 executives and technicians

2nd Year:

5 of the managerial level

13 superintendents, specialists and shift supervisors

(Nil) executives and technicians

3rd Year:

5 of the managerial level

(Nil) superintendents

(Nil) executives

At each stage, it will be negotiable whether the engagement of expatriates will be extended, shortened or eliminated, depending on the progress of the training of Ugandan counterparts. The contract with an experienced group of sugar technologists has enabled the factory to be run with far better results than the other two, with respect to the sugar recovery and plant maintenance.

Since its commissioning, the plant has operated for two periods, the first one being from July 1976 to July 1977, producing 5,409 tonnes of sugar, and the second one from February 1978 to 23 March 1979, producing 4,069 tonnes of sugar. Although it was not possible to trace a production diagram, it is evident that the operation of the factory was affected by the lack of cane supply due to the shortage of cane cutters and means for hauling cane to the plant. In order to solve this problem, a contract was made for purchasing some mechanical cane harvesters.

At the time of the consultant's assignment, the plant was operating with 11 per cent of its normal attainable capacity.

From the above it is evident how a serious degradation of the sugar industry has taken place. The two main factories (Kakira and Lugazi) which were producing about 135,000 tonnes of sugar per year until 1972 are now producing only 6,000 tonnes. The third factory (Kinyala), newly commissioned only in 1976, is operating at 11 per cent of its capacity. In view of this situation, the Ministry of Planning and Economic Development prepared a three year economic rehabilitation plan (1977/78-1979/80) under the name "Action Programme". For the Kakira Sugar Works, it is stated in the plan (article 5.19) that "the basic reason for the under-capacity operation of the factory is the dilapidated state of the machinery in the factory, workshops and plantation. Another reason for the present low capacity operation of the factory is the lack of skilled management and maintenance staff, and the incidence of poor industrial relations". For the Lugazi Sugar Works, it is stated (article 5.22) that "the factory is also faced with serious management and maintenance problems". For the Kinyala Sugar Works, it is stated (article 5.23) that "at present the factory is producing 50 tonnes per day or 30 per cent of the installed capacity. This is due to a number of problems facing the sugar works. The problems include shortage of plantation labour force resulting from lack of accommodation and shortage of adequate food supply for the workers, lack of transport for the sugar cane and lack of handling facilities at the cane handling yard".

Visit to the Factories

A visit to the sugar factories (Kakira, Lugazi, Kinyala) with a purpose of checking the condition of the equipment and discussions with the staff, revealed that:

1) the condition of the existing equipment and machinery is such that it is capable of processing much larger quantities of cane, than what is being processed now, should the problems of cane cutting and transport be solved;

2) the basic technical know how already exists due to:
   a) quick recruitment of some expatriate sugar technologists and technicians, immediately after other expatriates left in 1972. Their number was sufficient to keep the factories running and to train local counterparts (on-the-job training);
   b) a number of local young engineers, chemists and technicians sent for training abroad (India, Italy) by working in factories or attending the courses.

The Real Reason for Degradation

Dilapidated machinery and lack of know-how are not the main reasons for the low capacity utilization of the existing plants. They are responsible to a certain extent however, the major problems are:

1) Managerial

In general, much is to be done in order to create, among the factory personnel, industrial discipline, good relations, co-ordination and co-operation, sense of responsibility, interest to do the work properly and efficiently.

Up to 1972, the managerial posts were held by expatriates and local personnel were kept away from them. After the expatriates left the country, these very important posts were filled by outsiders with no industrial experience, particularly not in the sugar industry. As a result, they were unable to make the right decision for which long experience in this field of activity is required before correlation factors could be realized and expected results achieved. An example of improper decision is a lack of spare parts and consumables necessary for the process while the limited available funds are spent for equipment which will not be used for several years.

2) Financial

It is well known that no machines can work without replacing the defective parts by new spares. It is of great importance therefore, to allocate the foreign currency required for that purpose in due time and in order to keep equipment in operational conditions, which at present is not always the case.

3) Policy on Wages

The wages should be occasionally adjusted according to the changing purchasing power of the local currency and thus make the work in plantations, cane cutting and running factories more attractive.

4) Policy on Sugar Imports

As a result of the failure of the sugar industry to provide sufficient sugar for local consumption, the authorities import sugar for that purpose (approximately 11,000 tonnes equivalent to about US$ 2,200,000 in 1978). A larger portion of the amount spent for import may have been saved in the case that a smaller amount was spent for the necessary parts required for the rehabilitation of the sugar plants.

RECOMMENDATIONS

Based on the general assessment shortly described above, it appears that the cane sugar industry in Uganda needs to be rehabilitated and re-established in every respect. A precondition for a successful sugar industry is to have suitable machinery and equipment, and experienced and conscientious manpower. Regarding equipment and technical operations, it is recommended to consider contractual arrangements for rehabilitation and renovation of the Kakira and Lugazi plants to restore their original capacity. Also, rehabilitation of the cane plantation should be carried out parallel to the rehabilitation of the cane processing capacity. Depending upon the progress achieved, any further expansion may be considered in due time.

Regarding management and manpower, it is suggested to consider management contracts with an organization well established in this field and in a similar way once it was done with the Kinyala plant. It should be emphasized that running a sugar estate (factory and plantation) efficiently, necessitates permanent presence of experienced personnel on site, to solve "hour to hour" problems, to demonstrate co-ordination between different departments and their staff, to create industrial discipline and to train local counterparts on-the-job, which is the most efficient and cheapest way of training.

The details of such a contract may be elaborated following the discussion with a potential contractor and after visiting the sites, inspecting the present equipment and interviewing technical personnel. In principle, the following is a list of personnel and duration of their engagement which may be considered:

a) For a period of five years:
   - one technical general manager
   - one factory manager
   - one plantation manager
   - one chief engineer
   - one chief chemist (production superintendent)

b) For a period of four years:
- three shift engineers
- three shift chemists
- one electrical engineer
- two electrical supervisors

c) For a period of three years:
- two mill supervisors
- two powerhouse turbine attendants
- three boiler attendants
- one laboratory-in-charge chemist
- as many as required skilled labour and artisans.

In addition to the above, technical assistance from UNIDO may also be considered provided it is officially requested. This may consist of:

a) team of experts/consultants:
- sugar technologist
- senior mechanical engineer specialized in cane sugar equipment
- senior electrical engineer specialized in cane sugar equipment
- senior cane sugar agronomist.

They may spend two months each year for a period of five years, as considered most suitable, with the basic task of visiting all three sugar estates and prepare a report commenting on the progress of work and general performance results of the factories. Based on their recommendations, decision could be made on the priorities regarding any further investment in the cane sugar industry.

b) provide fellowships for training of six fellows, three engineers and three chemists, for studying sugar technology (possibly in Kanpur, India). They should have at least two years factory experience.