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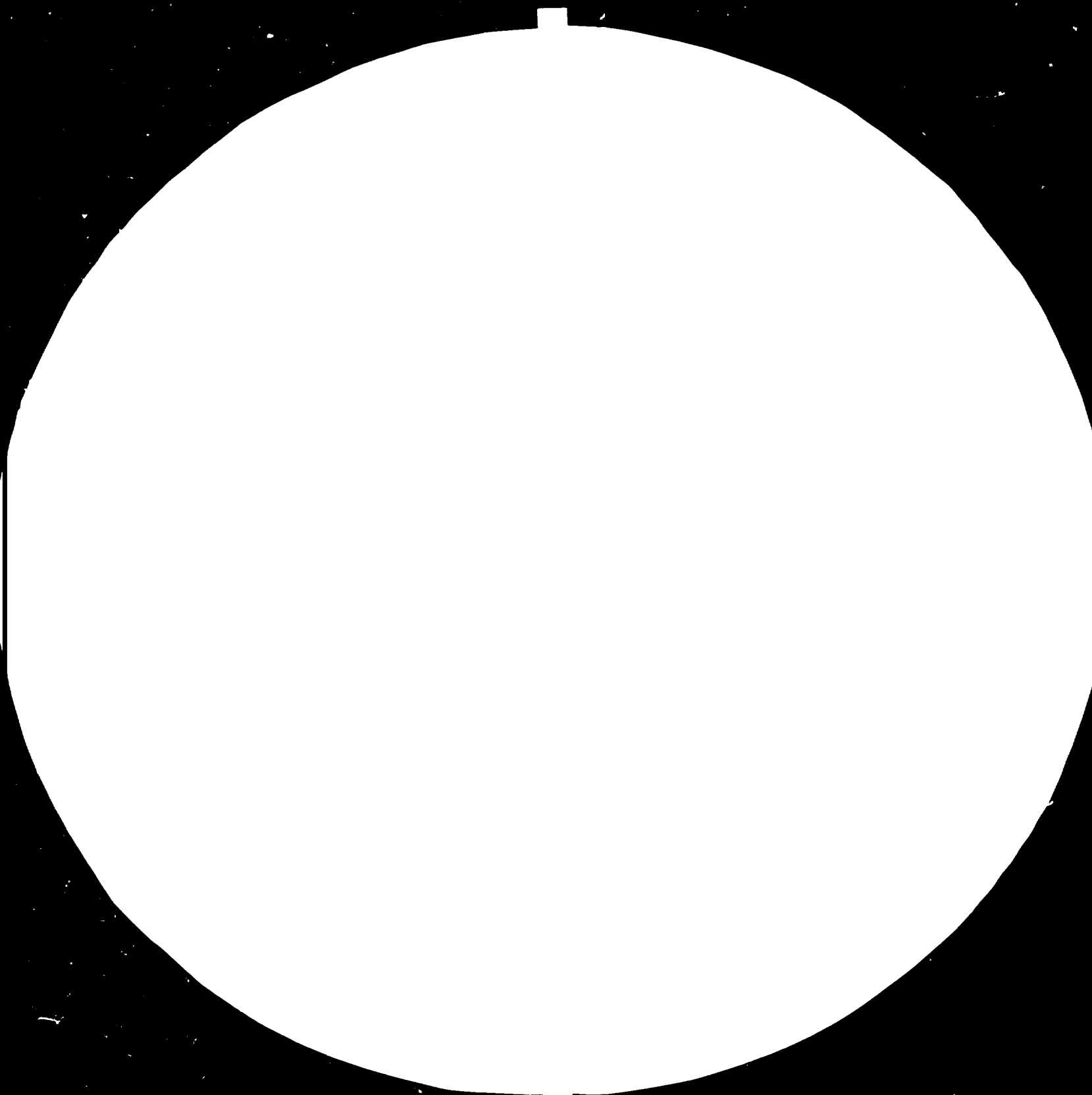

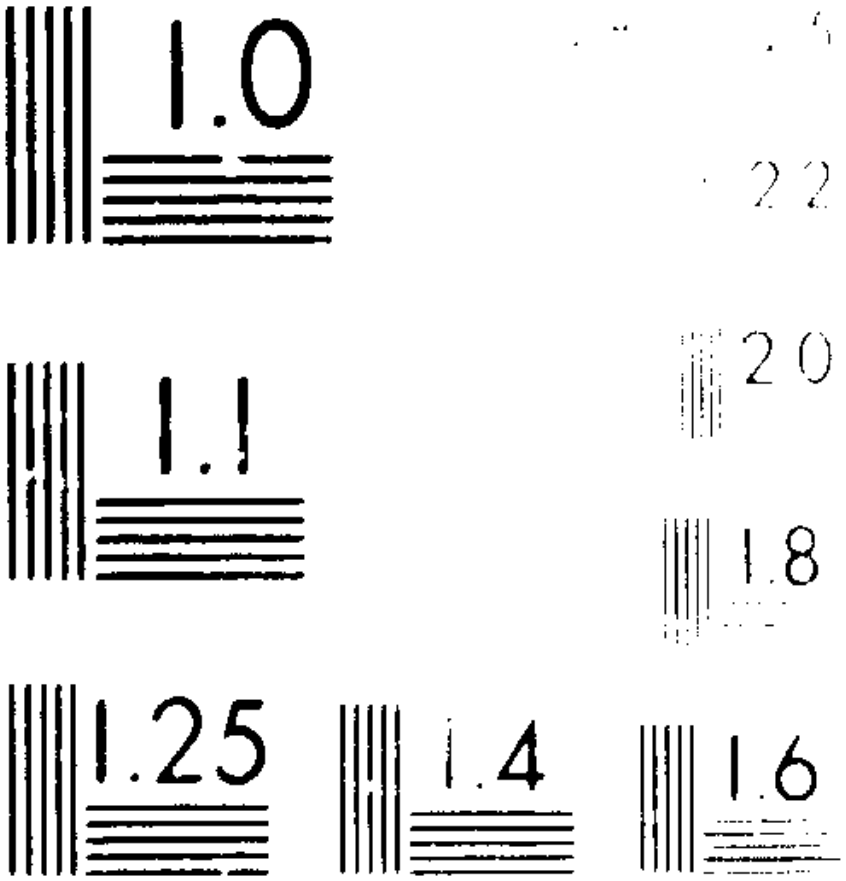
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EVALUATION OF SIERRA LEONE'S VEGETABLE OIL PRODUCTION SECTOR AND ASSISTANCE TO THE NATIONAL MOBAI AGRO INDUSTRIAL DEVELOPMENT PROJECT

SI/SIL/82/801

Mission Report*

Prepared for the Government of Sierra Leone by the
United Nations Industrial Development Organization

Based on the work of
M. G. Giacovazzi, expert in the vegetable oil industry

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ACKNOWLEDGEMENTS

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SECTOR STUDY

PALM OIL INDUSTRY

INTRODUCTION

Sierra Leone is richly endowed with oil palm trees growing in the bush. This natural growth, which has been estimated by various sources to the extent of 40 million to 120 million trees, has also encouraged the setting up of oil palm plantations and palm oil mills in the country. Besides this, an estimated 40,000 acres of oil palm hybrid plantations are reported to be presently in existence.

In spite of the existence of such vast raw materials, the country has been experiencing a crisis in palm oil and palm kernel oil production. The oil mills in the country have been running at a portion of their capacity; the per capita human consumption of oil in Sierra Leone is below the minimum required for normal dietary standards in tropical developing countries; there has been substantial wastages of available oil bearing sources while import of oil and fatty matters continues to be a drain on the foreign exchange.

The Ministry of Trade and Industry of Sierra Leone Government, recognizing the importance of this agro-industrial sector in national development and in the nutritional requirement of the people as well as, a source of employment and income generation in the rural areas, requested UNIDO for expert advise to identify the problems of the sector and to make suitable recommendations for its rehabilitation.

The UNIDO assigned Dr. Mario Giacovazzi to undertake this study. The UNIDO Adviser arrived in Sierra Leone on 20th October, 1982 and after a preliminary stay in Freetown to collect all possible and useful informations from various Government offices, to examine and analyse existing studies on the subject and to make contacts with knowledgeable persons and industrialists in one way or

another connected with the vegetable oil sector, initiated a country-wide tour visiting all palm oil mills and plantations, talking to various organizations and individuals involved in this agricultural and agro-industrial business, including out-growers, planters and villagers.

He studies the farmers' traditional system of extracting oil from wild fruits as well as oil extraction from cultivated fruits in the existing palm oil mills. The UNIDO Adviser had counterpart support of Mr. F.O.B. Walan of the Ministry of Trade and Industry and logistics support from the UNDP/UNIDO Project - SIL/80/007.

PRELIMINARY AND ESSENTIAL INFORMATIONS

There is traditional palm oil production in all those villages which have accessibility to wild palm fruits in a range of, more or less, one mile from the villages and along all interior roads. However, a large proportion of the wild oil palm trees scattered over the bush cannot be easily reached by villagers because of the high density and impenetrability of the vegetation requiring considerable effort to open up by knives and matchets.

From an aerial view, it is easy to realize the ventures of the wild palm trees present in the country. Southern and Eastern regions are the richest, North-Western region slightly less while Northern region is the poorest due to climatic condition. The same aerial view can also give an indication of the wild oil palm trees which can be utilized by villagers if the bush extension is compared with the relatively rare and small village areas.

As an indicative figure it can be assumed that only 10% of the total wild palm trees can be utilized by villagers. Considering an average conservative figure the presence of 80 million wild palm trees in existence in Sierra Leone, the number of trees suitable for exploitation should be around 8 million units.

In accordance with the UNIDO Adviser's observation, the wild Fresh Fruit Bunches (F.F.B.) yield does not exceed 0.02 tons per year and per tree, therefore, the total available wild F.F.B. per year should not be higher than 160,000 tons. Out of this, about 70% - let us say 110,000 tons - is processed at the villages both for red palm oil and oil palm kernel production, while the balance - say 50,000 tons - is utilized for oil palm kernels recovery in view of the fact that the mesocarp portion of the fruit is so thin that red oil extraction is not profitable. Therefore, the total red palm oil produced at an extraction rate of 15% on F.F.B. - will be roughly 16,000 tons from the wild trees. Besides a recovery of about 12,000 tons of oil palm kernels may be estimated from villagers. It may be pointed out that the kernel content of wild F.F.B. is remarkably higher (approximately 8%) as compared to the kernel content of F.F.B. from hybrid plantation (approximately 4%). While the rural red palm oil is sold directly in the villages, at a retail price higher than the oil produced by mills, (as red palm oil extracted by the traditional method is preferred by the rural people both for its taste and colour), the kernel production is acquired and collected by the Sierra Leone Produce Marketing Board (S.L.P.M.B.) for palm kernels oil production at the Palm Kernel Oil Mill in Wellington (Freetown) or for direct export.

Note:

It is significant to note that the statistics of palm kernels available in the country are erratic and cannot be relied upon to make a meaningful estimate of oil production in the country. From observation it appears that the oil production in the organised sector has decreased, while the villagers to some extent have increased their production by utilizing the fruits from the mill plantations.

HISTORY

At Colonial time, Sierra Leone had a railway line connecting inland areas to sea-port for transportation of goods such as coffee, cocoa, ginger, palm oil kernels, etc. suitable for export. At that time, around 1933-34, based on strong international demand for oil palm kernels and internal need of red palm oil, the idea to develop the wild oil palm trees potential into an industrial activity was put into effect.

The first oil mills were installed in 1934 in Mange and Masanki where the wild oil palm trees concentration were comparatively higher, followed later on by other mills in Baoma and Gambia (1945), Jagbweima (1950), Kanga, Wanjei and Telu (1952) and Sahn Maleh (1954). These mills called Pioneer Mills by the manufacturing firm, were well conceived in design and technology to the requirements of the rural areas. The materials used in the manufacture of the machinery is of high quality, the technology is simple and easy to understand in the remote areas and does not require sophisticated maintenance. According to the informations received on the spot (no records are available) the mills operated satisfactorily for several years.

From 1955 it appears that the Pioneer Mills began facing problems with respect to raw material supply. It seems that villagers stopped supplying wild fruits to the mills as they found more convenient to process the fruits themselves in their own traditional way. At a result it was decided to develop hybrid plantations, connected to the mills, in order to avoid uncertainty of raw material supply. This decision was based on the wild oil palm trees concentration and/or land suitability study. It is important to note that the concentration of wild oil palm trees is not a secure indication of land suitability for establishing oil palm estates in any given area. Under wild or semi-wild condition spacing between oil palm trees is usually larger than what agronomic conditions warrant for an oil palm hybrid plantation. When hybrid

plantations are established, the spacing between trees is pre-determined, and the trees get less sunshine and soil than the wild palms. When the soil and climatic conditions are not optimal the cost of inputs are higher and the returns per acre lower. If the suitability of the soil was examined prior to establishing oil palm plantations, sub-standard yields could have been avoided. Unlikely this concept has not been considered at the time oil palm hybrid plantation started. No study of soil and growing requirements for oil palm hybrids have been made. No accurate selection of hybrid seedlings in accordance with desired targets and land suitability has been performed. Some mills have been provided with plantations exceeding their milling capacity while, other have insufficient acreage. In no case, the yield of these plantations connected with Pioneer Mills have reached a yielding average in excess of 3 tons per year per acre of F.F.B. The yield in other tropical countries such as Malaysia, Costa Rice etc., is more than 8 tons per year compared to which the yield in Sierra Leone is very low indeed.

From 1960 the ownership and/or control of these Pioneer Mills and plantation passed from one institution to another, then again to the previous one and so on depending on political changes and interests. This fact has certainly adversely influenced the operations of the mills and their development. The lack of interest of the various managements is still evident from the poor state of maintenance of oil mills and plantations, subjecting them to extreme state of wear and tear without taking in consideration the possibility of loosing the production of the whole season through minor breakdown.

In 1976 at Daru a De Weeker Palm Oil Mill, with a processing capacity of 5 tons FFB per hour, was installed on behalf of Daru Oil Palm Co., which is a Government Company attached to the Ministry of agriculture.

In 1977 at Gambia/Mattru a Specimen Palm Oil Mill, with a processing capacity of 15 tons FFB per hour, was installed on behalf of Gambia Mattru Oil Palm Co. which is also a Government Company attached to the Ministry of Agriculture.

In 1979 at Mobai a palm oil mill based on two hand-operated hydraulic vertical presses, and complementary equipment locally fabricated, was established by the Eastern Clinic Rural Development Ltd. (ECRD Ltd.).

Findings

Starting his mission in Sierra Leone, UNIDO Adviser contacted all those industries and activities which in one way or another are involved in the local oil bearing sources as raw materials.

Chanrai Chemcials

It is a private company manufacturing laundry soap. This factory is placed at Wellington (Freetown) and meets a very large portion of the local demand of soap. The factory is well organized and self sufficient in as far as standby water and electric supply is concerned. The company uses only imported free fatty acids for soap production as it could not base its need of raw material on local supply due to unavailability of local raw materials.

Sierra Leone Produce Marketing Board - Palm Kernel Oil Mill (SLPMB-PKOM)

This factory is placed at Wellington (Freetown). It has a present installed processing capacity of 80 tons daily (24 hours) of palm kernels with oil production of about 35 tons per day. It is provided with efficient refining plant and reasonable infrastructures. Unfortunately its dependency on public supply for electric power has created, particularly in the recent months, several difficulties and break down in oil production.

Raw materials for this mill are kernels collected from villages by the Sierra Leone Produce Marketing Board - owners of Palm Kernel Oil Mill - and most of them comes from wild fruits processing. In 1982 no kernels have been recovered by the various palm oil mills in the country.

Very often part of these kernels are exported by SLPMB to international markets in order to earn foreign exchange leaving the PKOM capital equipment idle. The PKOM is also equipped with a plant for processing palm kernels cake into animal feed composition.

J. Mattar Oil Mill

It is privately owned oil mill for processing soft seeds, placed at Bo, Southern Province. This plant is in good working conditions. It is provided with seeds cleaning plant, automatic elevator and conveyor for feeding the screw presses, conveyor for extracted oil to filter presses and neutralization sector. Its processing capacity is 1.5 ton soft seeds per hour. This mill did not operate since the last two years for lack of raw materials such as sesameseeds (benniseeds), groundnuts etc.

Pioneer Mills

Masanki Pioneer Mill and Oil Palm Plantation

This Pioneer Mill was installed in 1934 and in 1982 handed over to Prisons Department together with 4300 acres of oil palm trees plantation by the SLPMB. The plant is in a very poor physical condition, maintenance has not been carried out for long years and, at present stage, it does not have financial resources for repairing or renewing essential parts.

It is running at a very low capacity; labour is partially supplied by the local prison. Oil production is limited and cannot certainly bear extra expenses in addition to the prisoners wages for harvesting all the FFB and transporting it for ultimate processing. No recovery of palm kernels is possible unless relevant equipment renewed. The plant is run by few skilled workers who were previously employed by SLPMB and supervised by prison police officers. The oil extraction processing system been nearly relegated to the traditional village system. The plant operates in accordance with the harvested FFB and generally not more than two days per week on an average. In few words at the present stage the mill is not operated as an industry but more or less like a rural enterprise which will collapse for lack of maintenance as soon as some part of the plant is damaged., which can happen anytime.

The plantation is divided in two sectors; 2800 acres situated in Masanki area while 1500 acres are situated in Waterloo which was approximately 25 miles from Masanki on the road to Freetown, When the Ribbi river had a normal crossing service by ferry-boat. But now that service has been cancelled the road distance between Masanki and Waterloo is approximately 120 miles making it uneconomical to maintain the plantation for the Masanki Pioneer Mill. Both plantations are out of economic production due to their age and large parts of them are on the way to return to bush conditions.

In any case a plantation of 4300 acres is far in excess to the real need of a Pioneer Mill whose requirement is approximately 5000 tons of FFB per year and therefore not more than 1000 acres of plantation; this acreage will be even less under normal yield conditions for hybrid plantations well maintained.

The presence in Masanki of a brand new large industrial building - new in the sense of never used although built in 1960/62 - and a number of valuable abandoned industrial equipment led us to think that an expansion programme of palm oil mill was under implementation at the time the railway was dismantled. Most probably the expansion was related to the large extension of the plantation.
Informations collected on spot confirmed this opinion but no drawings related to the programme are available. On the other hand, most of the equipment such as boilers, generators, sterilizers etc. have been shifted long time ago to other mills for replacing similar damaged items.

Mange Pioneer Mill and Oil Palm Plantation

This pioneer mill was also installed in 1934. Presently it is owned by SLPMB. There is a farm manager, a plant engineer and other skilled and semi skilled workers. The UNIDO adviser has visited the mill twice but he had no chance to see the plant in operation. For one reason or the other no Pioneer mill was working at the time of the visits and this statement is valid for all the Pioneer mills, except Masanki which was in operation only at the time of the first visit.

The plant situation in Mange, as well as the oil production, is the same as that of Masanki and, with minor variations in technical and mechanical difficulties, it can be considered the same for all pioneer mills in the country. Mange is provided with 4,000 acres of palm plantation out of which only few hundred are minimally maintained for mill purpose. The others are abandoned and are approaching to bush conditions. The age of the plantation varies between 18 and 28 years and therefore a part of it is already out of economic production.

Baoma Pioneer Mill and Oil Palm Plantation

This mill was installed in 1945 and it is presently owned by SLPMB, and reported likely to be transferred to Eastern Clinic Rural Development Ltd. (ECRD Ltd) for management. The mill is joined to a 800 acres plantation whose maintenance has been completely stopped in 1980. The age of the plantation is 22/23 years therefore, with little possibility of further utilization.

Jagbweima Pioneer Mill

This mill was installed in 1950 and its utilization was based, as per all Pioneer Mills, on the processing of wild fruits. As soon as the supply of wild fruits stopped the Pioneer Mill ceased its operations and part of the equipment has been shifted to other pioneer mills as spare parts. Presently some residual equipment is lying in Jagbweima on a guard custody. There are still a few valuable items owned by SLPMB.

Kanga Pioneer Mill and Oil Palm Plantation

Same type of mill, it was installed in 1952 and it is presently owned by SLPMB. General conditions of the plant, as well as oil production, are more or less the same as other Pioneer Mills.

A plantation of 1,150 acres is connected to the Pioneer Mill. The age of this plantation is between 20 and 23 years and its maintenance has been completely stopped since 1981.

Telu Pioneer Mill and Oil Palm Plantation

The Pioneer Mill has the same age of the Kanga and it is presently owned by SLPMB. It seems that negotiations are on the way to transfer this mill to ECRD Ltd. A plantation of 400 acres started in 1960 and completed in 1965 is attached to the mill but its maintenance has never been done in the proper way.

Gambia Pioneer Mill

This mill is in the same condition as the one situated in Jagbweima.

Wanjei Pioneer Mill and Oil Palm Plantation

Installed in 1954 it seems to be in slightly better condition than the other mills. It is also provided with FFB steriliser - which has never been used in addition to the usual fruits sterilization. It is owned by SLPMB and apparently it is under negotiation for its transfer to ECDR Ltd. It is joined with a oil palm plantation of 536 acres divided in several small areas out of which only 44 acres are under maintenance operation.

The age of the plantation varies from 18 to 20 years old and therefore suitable of further utilization.

Sahn Maleh Pioneer Mill and Oil Palm Plantation

Same type of mill installed in 1954, owned by SLPMB. Physical conditions are more or less the same of other mills as well as present palm oil production.
The Mill is joined to a palm oil plantation of 1850 acres the age of which is 22/23 years old. No maintenance has been applied for the last fifteen years except for few hundred acres which have been reactivated in 1980/81.

Daru Oil Palm Co. Oil Mill amd Plantation (DOPC)

A De Weeker palm oil was installed in 1976 with a processing capacity of 5 tons FFB per hour, joined with a plantation of 1782 acres, all in economic production, and 400 acres of complementary outgroovers plantations. At the time of visit the UNIDO Adviser noted that the sterilization equipment as well as oil extracting equipment were in operation while the kernels production plant was stopped. The reason for this was reported to be one damaged boiler out of the two, which provided less steam power, insufficient to run the whole plant.

In addition the elevators of kernels sector got rusted by the salt solution used for seperating shells from kernels. All the residual product, after oil extraction, was used for firing the boiler. Factory's infrastructure is inadequate. Few workshop facilities kept in good order and very few spare parts stored in a correct way.
It is reported that the storage facilities for oil are insufficient which is a great handicap during peakseason, when the demand for oil decreases due to the presence in the market of red palm oil produced by villagers from wild fruits, and stockage in this case become imperative. Complaints were also made for lack of spare parts as well as lack of working capital. Palm oil plantation is kept at a reasonable maintenance level and according to the informations collected on spot the expected FFB yiled should reach soon 5 tons per acre. The oil production in the season 1981/82 has been 1510 tons processing 7471 tons of FFB with a rate of oil extraction of 20.2%.

Gambia Mattru Oil Palm Company - Oil Mill and Plantation (GMOPC)

A SPEICHIM palm oil mill installed in 1977 with a processing capacity of 15 tons per hour, joined to a plantation of approximately 7000 acres in economic production and 3000 acres of complementary out growers plantations. At time of visit UNIDO adviser noted that the whole plant was stopped. The yard at the palm oil mill compound was covered by FFB under self combustion process. The cause was due to the breakage of a generator's element which took place few weeks before causing the complete breakdown of the plant. The FFB already transported at the mill fermented up to the point of self-combustion.
There are not infrastructures at the mill; no workshop, no spare parts, no store, no maintenance garage.
One important handicap was the lack of financial resources for facing the difficult situations.

The management hopes that it will get a loan which will allow the Company to provide equipment and spare parts for reactivating the mill. A remarkable loss had to be accounted for the unutilization of FFB yield. No information concerning the production of the season 1981/82 was available. The last available figures refers to the season 1979/80 stating that the oil production has been 1432 tons from 8227 tons of processed FFB at a rate of 17.4% oil extraction. The palm oil plantation is kept at areasonable maintenance level and according to the information collected on spot the expected FFB yield should reach soon 5 tons per acre.

Eastern Clinic Rural Development Ltd. - (ECRD Ltd)

On his first visit to the ECRD Ltd., in Mobai - which is one of the specific private enterprises to be assisted by the UNIDO Adviser under the SIS assistance, the UNIDO Adviser noted the following: palm oil mill based on two hydraulic vertical presses, hand operated, and some complementary equipment locally fabricated such as a cooking pot for FFB, oil tanks for stockage, etc. run by a medium size boiler. A 5 KWA diesel generator supplies electric power to the oil mill and to other asscciated enterprise, while a small lister engine run the fruits digester. A motor-pump supplies water from the well to the main tank.

- a palm oil plantation of about 1200 acres divided in 14 lots under various chiefdoms, out of which 350 acres are in economic production and the balance will be in economic production from now to 1987. The plantation is at reasonable maintenance level.
- a soap making activity based on four saponification pots, locally manufactured for direct firing, and complementary equipment such as wooden boxes for soap solidification in blocks, wire cutting apparatus for soap cubes etc.

- a stamping section for soap located 200 yards away from the main compound in a seperate building which is also used for drying soap cubes by natural ventilization.

The equipment is in a very poor physical condition and no factory's infrastructures are available. There is no workshop, tools are almost nil, and no skilled worker can take care of the equipment.

The installed capacity for processing FFB is approximately 10 ton per day (8 hours) with an oil production of roughly 1.8 ton per day; but difficulties in FFB supply and sterilization system decrease the capacity to less than 50%.

General Considerations and Remarks

Traditional palm oil extraction from wild fruits is made at villages in a very simple way. FFB are kept for few days in hot humid place (generally covered by palm oil leaves) to facilitate fermentation and therefore detachment of loose fruits from bunches. The operation causes a partial enzimatic transformation of oil into free fatty acids and this is the reason of the strong taste of traditionally produced red palm oil which meet the preference of local people. Fermented fruits are then crushed by wooden pestel in a wooden mortar and the paste transferred into a pot with water kept at boiling point. The oil flowing at water surface is collected and stored.
This method allows to obtain a higher oil extraction index than the screw press or centrefuge system. The residual material is essicated for recovering kernels by crushing manually the nuts and seperating kernels.

It is UNIDO Adviser's opinion that this system can be improved by using simple rural equipment to be introduced at villages level in order to facilitate the work, increase the production and give, therefore, an incentive to enlarge the wild FFB collection areas around the villages and increase therefore the utilization of natural resources.

From an agricultural point of view there was a basic misunderstanding in establishing oil plantations without accurate studies of soil, climatic conditions, etc.
This basic mistake can be slightly minimised if required improvements will be undertaken. It is UNIDO's Adviser's opinion that almost all hybrid palm oil plantations have not been cured at the right time but left to nature's assistance, Lack of maintenance of plantations by outgrowers. with no agro-industrial targets to be reached is not so serious from the industrial point of view. It cannot be accepted when the plantation is attached to a mill and large additional investments are involved with scope to earn, considerably foreign exchange and influence the loving standards of many.people. The assistance given to the plantation, its maintenance, the use of fertilizers in order to replace what the fruits production absorbs constantly from the soil (no bank account can have always a credit balance of withdrawals are not compensated by deposits) are critically essential expenses; they are as the life insurance policy for the plantation. In effect it has been noted that up to now no plantation in Sierra Leone , including Daru and Gambia/Mattru, has given a FFB yield higher than 3.5 tons per acre; this yield is the minimum required in this country for considering a plantation agriculturally feasible.
UNIDO Adviser would like at this stage to point out that the real natural resources of Sierra Leone are; the land, the sun and the water. These are God's blessings that only few countries in this world are endowed with.
These natural resources must be developed experimenting first alternative solutions to oil bearing sources, such as soya beans, sun flowers etc. (as we are in terms of vegetable oils) and then proceeding with intensive relevant cultivation. It will be very easy to quadruplicate, in terms of value, the yearly yield per acre.

It is clear that the present land tenure system, with its obsolete aspect, is a great handicap for this kind of development. We are sure, anyhow, that the Government shall find a satisfactory solution to the problem giving strong incentive to agro-industrial development in the context of traditional values.

From an industrial point of view, before going to particular remarks concerning the various oil mills, UNIDO Adviser would like to clarify some general aspects of F.F.B. processing system.

There are in the country two peak seasons of F.F.B. the first starts in March/April ending in June/July, the second runs from October to December. Therefore we must consider 200 days of peak season and 160 days of inactivity when only some erratic amounts of F.F.B can be harvested and processed. As the storage of palm oil fruits is impossible for its extremely high cost (only cold, dry, ventilated store can delate fruits fermentation) the total yields of F.F.B. must be processed in 200 days, therefore, if there is sufficient yield, the mill must work 24 hours daily for 200 days. This is a fundamental concept to profitably run an oil extracting unit: higher utilization of fixed costs. The balance of 160 days of reduced activity should be spent in plant and plantation maintenance.

It is UNIDO Adviser's opinion that, generally speaking, the idea of three shifts work does not apply to the bureaucratic system in operation at the various oil mills. Another concept which must be taken into serious consideration in every oil mill is the best utilization of by-products. The by-products are the first profit of an oil mill.

In the case of palm oil, at the present stage, when we talk about by-products we refer to palm oil kernels. It is a valuable product corresponding to almost 10% of F.F.B value, or 5% of produced palm oil value. It is foolish to throw this valuable product into fire, in the real sense of the word.

Another general point of view that should be considered in the organization of a factory, in this case of an oil mill, is the assignment of specific jobs to the workers. In accordance with labour syndicates and rules every employee can be called to perform a lower qualified job; no worker can be called to perform an higher paid job without relevant compensation.

In addition there is a remarkable lack of trained technicians. Some graduated employees have been sent abroad for training in specific fields. Returning home (those which have not decided to stay abroad) in most cases, they find they are trained to solve the problems in the country where they have been trained, but not how to solve specific problems in their own country as problems and solutions are completely different from one country to another. It can happen also, if the concerned person has open mind willingness and initiative he will start his own job neglecting the original reasons of his training. UNIDO's adviser's opinion is that training has to operated on spots in accordance with local needs and conditions.

All oil mills in Sierra Leone must be considered small or medium scale industries and therefore bureaucracy should disappear from these mills as there is not enough income to support such a loss. Bureaucracy which has not to be misunderstood with apathy, indolence, lack of interest as generally happens in all visited factories - can become imperative in large scale industry where a deep control is needed.

As a final consideration UNIDO adviser would like to point out that workers' employment must be rationally planned in accordance with factory's needs and targets. An excess of labourers - which has been found common in all visited mills - is not only a real cost but also a reason of chaos in the normal activity of the factory.

It is a negative industrial aspect which must be avoided as an industry cannot be considered a welfare organization. At this point the only possible solution is to better distribute the work, increase the production, install shifts worktime, divert workers to other complementary activities in the industrial area or agricultural sector.

Pioneer Oil Mills

The visits to the Pioneer Mills left a negative impression on the adviser. A sense of abandonment, coupled with lack of interest starting from the plant managers to the last worker, gives the idea of the present situation. The presence of idle equipment due to damaged items which can be easily repaired or renewed locally (no foreign exchange requirements) and the fact that all faults have been reported to the central management without any reaction lead us think that the apathy and lack of response from high-level management is a major hurdle in the system. There are certainly reasons which brought the management to lose interest in these, rural enterprises and it is not UNIDO Adviser's duty or right to identify such reasons.

There is an invested capital which, although completely depreciated after so many years of work, is still in a position to generate employment and profit. It should not be abandoned particularly in Sierra Leone which has acute capital and foreign exchange scarcity.

- There are plantations which, even if in part are out of economic production, can be still utilized and slowly renewed with different criteria. It cannot be forgotten that the land preparation has been a huge capital investment.

- There is a national need of employment and nutrition which have to be satisfied to avoid social troubles.

- The rehabilitation of these enterprises requires further marginal capital investment which is well worth considering its effect on reactivating so many mills and plantations and the manyfold additional income it will generate.

- The rehabilitation of these enterprises requires a drastic change of the system (keeping in mind that it is easier to train new elements than to change old mentalities), more understanding and collaboration between plants and central management to render the latter more responsive to the needs of the plants.

Daru Palm Oil Company (DOPC) - Gambia-Mattru Palm Oil Company (GBOPC)

Both Companies are facing more or less the same problems. It is important to emphasize that the main cause of the present undesirable situation in the mills may be attributed to inefficient management practices. It is true that a palm oil mill, connected with its own palm oil plantation, requires a certain number of years to reach an industrial and economic stability, but this does not mean that an enterprise can start its operations without a careful study covering provisions and contigencies related to the interim period before reaching the break-even point.

Through the analysis of the present situation it appears clear that both enterprises had started their operations without a predetermined planning schedule and that at the first services problems the enthusiasm collapsed and it has been replaced by apathy and lack of interest at every level. It is painful to see such a capital investment accumulating losses for the inefficiency of the bureacratic apparatus. It is time to realise that no industry can run without good foundations such as organization, management experience and capability, management authority and responsibility. Without these pre-requisites no sustained industrial development is possible. A responsible management could have easily overcome the reported mechanical and structural problems faced by both factories by using its authority in taking prompt decision (as to send immediately someone abroad for buying the needed generator's part or by shifting damaged boiler to the National Workshop in Freetown for quick repairing). In case of lack of support from higher levels to management decision it would have been better, in this case. to transfer all responsibilities to the bureaucratic apparatus.

It is the opinion of the UNIDO Adviser that there are always alternative solutions for every technical and industrial problem but only one solution for a wrong organization ,

i.e., a drastic change of the whole system of management practices keeping as a constructive experience the past mistakes.

Eastern Clinic Rural Development Ltd. (ECDR Ltd.)

UNIDO Adviser has spent in Mobai, in different occasions, about forty days of his assignment. The situation of this enterprise was chaotic and difficult to understand for the various interests involved. Now it is possible to fix a schematic frame of its organization.

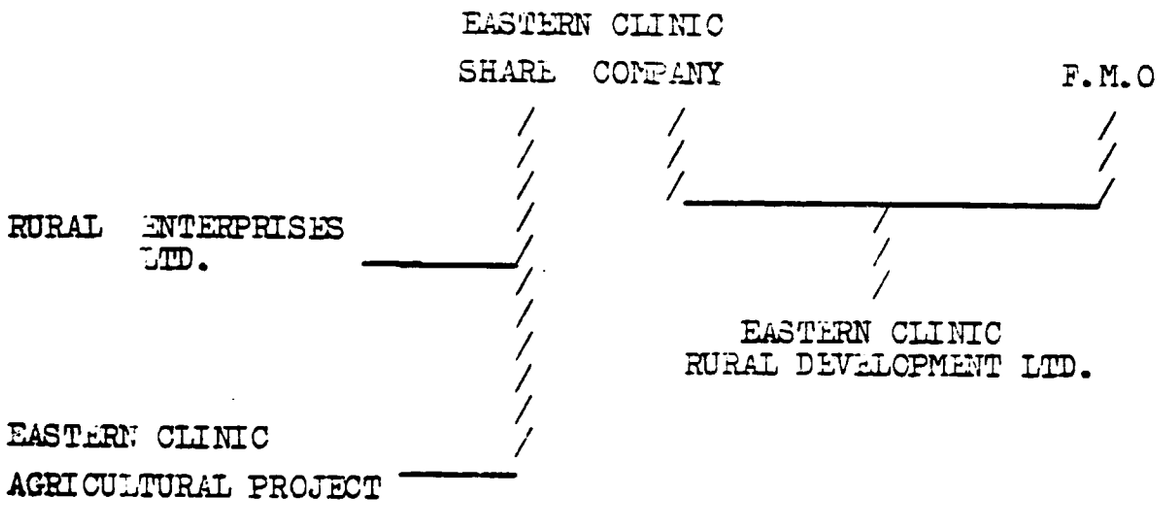
In 1967 the Eastern Clinic Share Company (ECSC) has been founded as a philantropic institution. Dr. Kobba is its major shareholder and Executive Director. ECSC has obtained and obtains presently free contributions in medical assistance, equipment, pharmaceutical products, and cash donations from several international institutions, foreign universities etc. At present, the Clinic is provided with 40 beds, operation theatre, clinic laboratory, X-ray Department, Pharmacy, Out-Patient Department, and First Aid Section, and a few houses for the employees of the Clinic. Building expansion is under contruction for increasing the number of beds for enlargement of Out-Patient Department, Dental Clinic installation. Considering that external help cannot last for ever, ECSC started in 1969, a palm oil trees plantation programme as a basis for future agro-industrial development capable to generate income for fulfilling the objectives of the ECSC. The plantation went on more or less normally up to 1979.

when the ECSC and the Netherlands Financing Company for Developing countries (FMO) founded the Eastern Clinic Rural Development Limited (ECRD Ltd.) with the objective to enlarge oil palm trees plantation and start palm oil production. Some imported machinery, associated with local manufactured equipment, have been installed and the oil industrial activity started. Contemporaneously the oil palm plantation has been enlarged.

During this period, Dr. Kobba installed a soap pilot plant for production of laundry soap, and he founded the Rural Enterprise Ltd. which will operate the ECSC industrial activity - particularly soap production - at present and future development.

In 1983 the ECSC has also promoted the Eastern Clinic Agricultural Project which will take care of future enlargement of oil palm trees plantation and other agricultural initiatives.

The following scheme shows the position of the various companies and their connection:



Showed in this way everything appears clear and functioning. In effect it is not so. First of all the accounting system is rather confused. ECSC accounts are mixed up with ECRD Ltd. account as well as with Rural Enterprises Ltd. It is almost impossible to establish the cost of F.F.B, the cost of oil production and to deeply study the financial aspects of the various companies. In few words the thermometer of the whole complex i.e., sound accounting practice is missing. The lack of responsible and capable technicians results in ratio between cost of labour and production remarkably higher than the normal. The lack of common

infrastructures - mechanical, electrical etc., - results in periodic break-down which cannot be rectified because of lack of spares, appropriate tools and expertise, the consequences of which can be easily understood. The critical cash flow situation does not allow quick response from management in order to solve daily problems while the fixed costs continue to be a drain on their resources.

During his stay in Mobai, the UNIDO Adviser started a rehabilitation programme on the principle:-

a) increase the production for a better utilization of fixed costs;

b) re-organize the various activities as separated units with proper limits and responsibilities.

Technical assistance, managements consultancy, discussions, suggestions, drawings have been provided daily at factory during the tour. Practical assistance has been given in assembling machinery, in following up the construction of some equipment locally fabricated etc. In the last period, in order to accelerate the conclusion of at least part of the programme the UNIDO Team has been increased with the extremely valuable collaboration of Mr, Raza Ali, Industrial Engineer and Mr. C.R. Badrinath, UNIDO Mechanical Engineer Volunteer. All their efforts did not get full impact due to the deficiency of cash flow for facing the simplest needs, for lack of essential tools and facilities, and the dis-organized state of the Company.

The present situation in Mobai is the following:-

- a modification to the hand-operated vertical presses in automatic system has been sent by F.M.O. and it will be installed in two months' time by manufacturer's (Stork - Holland) Experts. This modification will allow to increase oil production decreasing the number of labourers which can be utilized for other purposes;

- a bunch stripper and larger dygester will be installed to supply enough material to the modified vertical presses;

- all the equipment will run through a new diesel engine of remarkably higher capacity;

- the increase of oil production will allow to increase also soap production and, for this purpose the Adviser prepared designs and drawings for new saponification pots, conical bottoms, with relevant mixing appliances for being locally manufactured, together with a screw pressing machine for soap profile. This equipment will facilitate productive operations and will improve soap quality, decreasing the number of needed labourers. For cash flow difficulties this equipment is still lying at Bo, with the local manufacturer.

- second-hand equipment for soap manufacturing, such as automatic dyer and stamping machines have been brought from Germany and they are on the way to installation.

- F.M.O. has sent two Expatriate Experts, one economist whose wife being a Medical Doctor will work at the Eastern Clinic and one Agriculturist for a period of three years to assist the ECSC re-organize its administrative and operative systems.

Although the general situation in Mobai is at a very critical point, and repeats more or less the same negative aspect of the other oil mills in the country, the UNIDO Adviser is of the opinion that it can improve up to a satisfactory limit provided the present management will follow the suggestions given by various sources.

CONCLUSIONS AND SUGGESTIONS

As already reported to the Ministry of Trade and Industry in Sierra Leone through an 'Outline for Rehabilitation of Palm Oil Industry and Oil Palm Plantations' the general situation is very critical and, unless drastic measures are taken in relatively short time, it is destined to a complete break-down.

In addition to the general suggestion, given above, the UNIDO adviser would like to recommend:-

- SLPMB - as owner of the Palm Kernel Oil Mill to increase the activity of PKOM avoiding export pf palm oil kernel. The same raw materials can be processed here, fully utilizing the PKOM facilities, generating profit and employment. Needed foreign exchange can be provided by searching markets for finished products such as refined palm kernel oil and palm kernel cake. A big generator,, capable to run the whole factory in ca se of emergency, should be installed at PKOM. By increasing the palm kernel recovery - as explained in other parts of this report - the PKOM should be in the position to work at least 16 hours per day for 300 days per year giving, in this case, a great contribution to the industrial development of the country.

- Daru Palm Oil Company and Gambia-Mattru Oil Company which are negotiating a substantive loan from the World Bank and private participation in the Companies to review completely their management system transferring power to the plant level where general management should be also located.

- ECRD Ltd. and ERE Ltd. to clarify their internal position, to change management system giving more responsibilities to the sectoral heads. The Managing Director should delegate day-to-day responsibilities

to sectoral heads and should over-see their performance periodically. He should take the best from the new comers Expatriate assistance and should limit any further enlargement of his activities until he has not reached full stability in the present enterprises.

In consideration of what has been previously reported an immediate action is required for solving the critical position of palm oil mills and oil palm plantations in the country.

The UNIDO Adviser has examined several alternative solutions; only two of them seemed to be practicable while others had to be rejected being unsuitable:

a) implementation of a Common Agro-Industrial Facilities Project (CAIF Project) for the rehabilitation of the various palm oil mills and plantations;

b) call for private capital equity - if available - shifting management responsibilities to the new participation.

COMMON AGRO-INDUSTRIAL FACILITY PROJECT -(CAIF PROJECT)

Any industrial or agro-industrial activity requires three basic pillars on which to build on a strong and solid enterprise:

1) Organization (Management)

2) Capital

3) Labour

A good management may, most of the time, overcome lack of capital and labour difficulties. Labour and capital in hand of a bad management are due to fail. It is therefore evident that improvement of management system shall be the most important target to be reached by the CAIF Project. No financial assistance will solve the

present problems of palm oil mills and plantations if management level will remain at this level; a financial help in this case will mean only a further loss of money and time.

The development objectives of C.I.F Project should be:

- to reactivate the existing palm oil mills and relevant plantations for the production of edible red palm oil and for the utilization (recovery) of palm kernels currently wasted.

- to offer management consultancy, technical assistance and training to every mill in the country;

- to promote agro-industrial rural development for increasing the utilization of avialble oil bearing raw materials;

- to provide income generating opportunities in the rural areas through additional employment;

- to study the feasibility for processing all oil mills wasted materials in a common centralized unit, to develop experimental system for identification of other profitable oil bearing sources, as well as agricultural products suitable to directly or indirectly (through agro-industrial activities) generate foreign exchange income.

On this subject, at the initiative of the Permanent Secretary of the Ministry of Trade and Industry, a Meeting had been called on the 17th May, 1983 for discussion among all interested parties. After discussing the above proposals at this Meeting, the recommendations are in principle approved by the Ministry of Trade and Industry of Sierra Leone Government and Project Documents are under preparation through the Industrial Development Department of the Ministry.

Note:

Masanki has been indicated as the most suitable location, at this stage, for the development of a Common Agro-Industrial Facilities Project for the following reasons:-

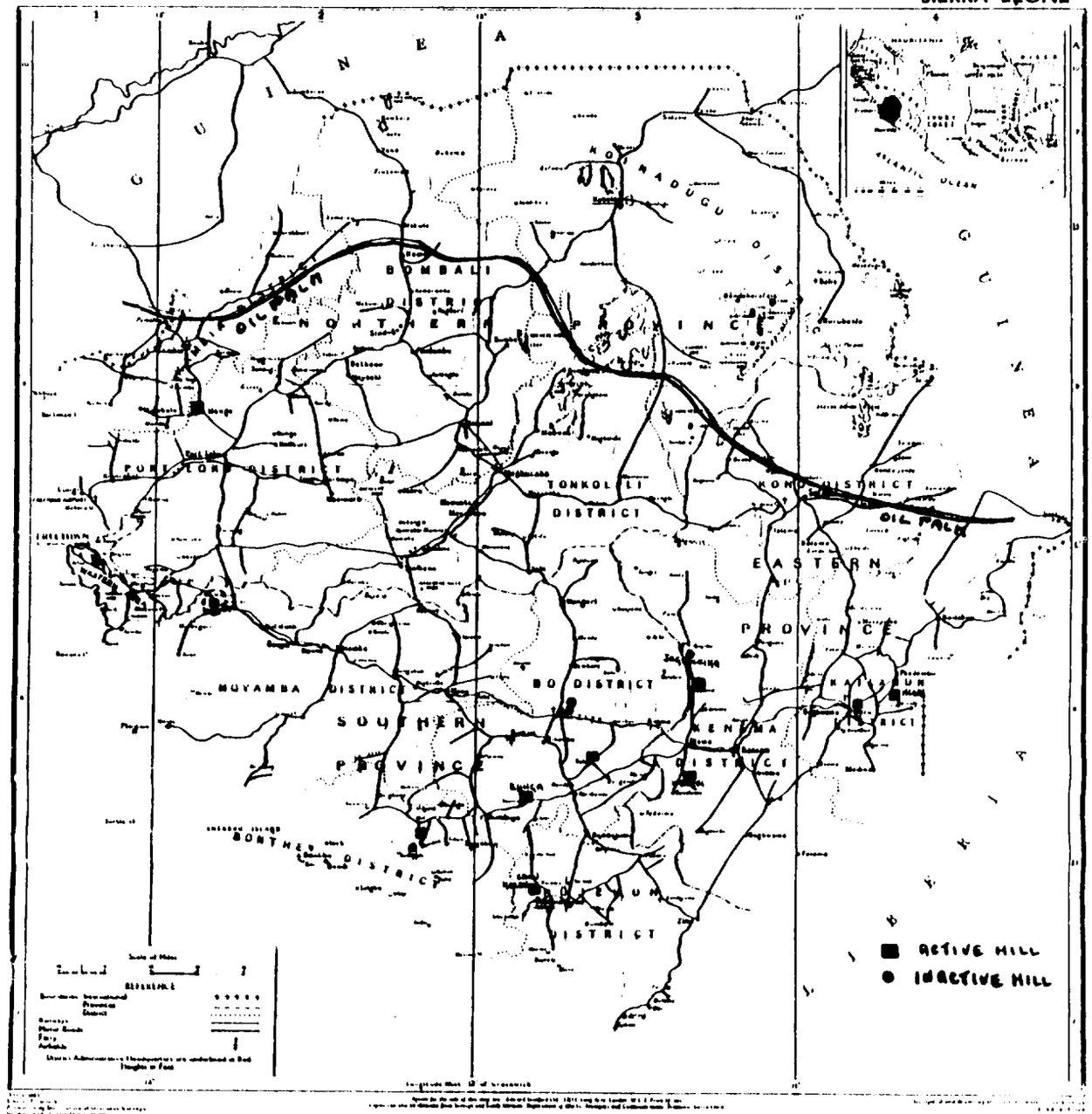
a) although the location cannot be considered as the geographical centre among the various oil mills, it has already un-used building facilities suitable for the installation of workshop, offices, laboratory, etc. thus avoiding huge capital investment in constructions;

b) Masanki land is State owned land. The Project foresees, in addition to the renewing of palm oil plantation for Masanki Pioneer Oil Mill purposes - which will not cover the whole area - the use of land for experimental purposes and in this way all possible misunderstandings with local chiefdoms and people will be avoided;

c) in case of irrigation needs the near Ribbi River can supply all required water;

d) by reactivating the existing railway bridge on Ribbi River -(which requires only to be paved as steel structures are in perfect condition) Masanki will be at 10 miles from the main road and therefore all other mills can be reached in few hours travelling.

SIERRA LEONE



MINUTES OF THE MEETING ON REHABILITATION PROGRAMME FOR PALM OIL INDUSTRY AND OIL PALM PLANTATIONS TUESDAY, 17TH MAY 1983

Present		Department/Ministry
Mr. E. O. Davies,	-	Ministry of Trade and Industry (Chairman)
Mr. J. ... M. King	-	Ministry of Trade and Industry
Mr. A. ... Ahmed	-	"
Mr. S. B. Banya	-	"
Dr. A. D. Monteiro	-	"
Mr. F. O. B. Walan	-	"
Mr. C. A. Gunawardhana	-	"
Ir. M. Giacovazzi	-	"
Mr. Zac Richards	-	Sierra Leone Produce Marketing Board
Mr. ... K. M. Sankoh	-	"
Mr. O. Alghali	-	National Authorising Office
Mr. Dumbuya,	-	PEMSU, Ministry of Agriculture and Forestry
Mr. A. Muttuligham	-	"
Mr. I.F. Contreras	-	UNDP
Mr. J. C. Kakonge	-	"
Mr. H. Younes	-	Mano River Union
Dr. B. K. Kobba	-	ECRD, Mobai
Mr. T. F. Sesay	-	Prisons Department
Mr. J.V. Buhinday	-	"
Mr. N. B. Alpha	-	Gambia-Nattru Oil Mill
Mr. Bassima	-	Daru Oil Company

The Meeting was opened by the Permanent Secretary, Ministry of Trade and Industry - Mr. E. O. Davies, who was also Chairman for the occasion.

In welcoming participants, Mr. Davies told them that he was particularly happy about the unusual turn-out and stressed that this was an indication of the importance that they all attached to the subject to be discussed.

He expressed the hope that they will arrive at a consensus on prescribed solutions.

Palm oil, he went on, is very crucial to our development at a time like this and the industry should be further developednto enhance our policy of import substitution to enable us to save scarce foreign exchange. He then introduced Dr. M. Giacovazzi who has been assigned to the Government by the UNIDO and a Consultant to undertake the study.

Dr. Giacovazzi thanked the Chairman and expressed the hope that the results of his assignment and recommendations will be satisfactory. According to him, there exists a basic misunderstanding about the oil palm industry and plantations. People assume that the existence of wild palm trees in abundance in certain areas was a secure indication to establish hybrid plantations. This is not always true. Palm trees require appropriate soil, humidity, climate and continuous maintenance with fertilizer input. Proper study must be made of the soil, weather conditions, humidity, sunshine, and rainfall etc. before initiating oil palm plantations. He also pointed out that the choice of seedlings for nursery was another important factor. He butteressed his points with samples of fruits produced by the wild palm trees and plantation palm trees. He showed the cross section of the fruits, showed differences in the thickness of the mesocarp, shell and kernels. He further poifted out that the fruits from the plantations which received some care has a thicked mesocarp which offered a higher yield of palm oil.

Mr. Davies then asked Dr. Giacovazzi what proposal he would make to improve on the present situation.

Dr. Giacovazzi made a strong case for the rehabilitation of the existing plantations and the mills in order to obtain maximum national benefit for existing investment. He said that due to lack of planned maintenance of the mills and proper know-how in managing the plantations the production of palm oil is on the downward trend. An industry, he went on, cannot be run like a Government Department. Because of faulty management practices all the nine Pioneer Mills are in a very poor physical condition and only seven out of the nine are in a position to be rehabilitated. He suggested therefore, that it is imperative that the general management of the enterprise should be very close to the plant management and it should be placed in the factory premises to enable on-the-spot decisions to be taken.

Other important factor to be taken into consideration is the use of by-products which increase the profitability of the industry. He went on by showing how the oil extracted from the waste fibre through solvent extraction was used for soap making, and how valuable charcoal from the burnt shells could be transformed into briquettes for use as high calorie fuel. He pointed out that the cleaned fibre can be used for upholstery and, probably, as chemical pulp for paper. He stressed the need to recover the by-products. He pointed out that the mills were utilizing high value by-products which have industrial value as fuel instead of firewood which is comparatively cheaper.

Mention was then made of a medium-term proposition to establish a Common Facilities Centre (CFC) as an autonomous institution. He stressed that the decision to establish the CFC should be taken immediately so that it becomes functional in about 12 months time. Otherwise the Pioneer Mills will deteriorate further and their cost of rehabilitation will be disproportionately higher. The CFC

should initially assist the various oil mills and plantations in a rehabilitation programme and later on study the feasibility of processing by-products in an associated way. The first stage should include maintenance of milling machinery and equipment, supply of spare parts (mainly locally fabricated but also imported ones), technical and agricultural training, management consultancy etc.

Participants were informed that Masanki was indicated as a possible location for a CFC because of the existence of considerable infrastrcutural facilities which will subsubstantially reduce initial investment costs and effectively utilize existing idle capital investments in the country.

Since it will be impracticable to equip every mill with a workshop which may turn out to be more expensive than the existing mill, this proposed centre will be centralized and equipped with workshop facilities, warehouse for stocking spare parts, a mobile workshop, a laboratory and radio/links to the mills to serve the existing mills requiring assistance and to develop and fabricate small rural oil mills.

At this point, the Chairman took leave of the Meeting and introduced Mr. J. A. K. King, Principal Industrial Development Officer, Ministry of Trade and Industry who took over as Chairman. Contribution from the floor came from Dr. Kobba of the Eastern Clinic Rural Development, Mobai. He thanked officials for inviting him to participate although he was a private businessman. He went on to suggest that the proposed Centre should not be a Government institution. He said that he was convinced speaking from experience that the Centre will only be efficient and serve its purpose if it is fully autonomous and run as an industry.

Experience, he went on, has shown that most institutions run by Government are not economically viable because more times than not they were fully involved with politics. He also questioned on the programme of this Common Facilities Centre.

At this juncture, Mr. Zac Richards was introduced as the counterpart of Dr. Mario Giacovazzi appointed by the Ministry of Trade and Industry. Mr. Richards in his contribution referred Dr. Kobba to the Working Document which had been circulated earlier on and where some of his questions are already answered. He however, stressed the need of the Common Facilities Centre and mentioned that such Centres are not uncommon in developing countries and that they have been found to be very useful and economical. Mr. Richards assured all present that the CFC as proposed will not in any way interfere with the autonomy of the oil mills and compared the functions of the CFC to that of a garage where anyone can go in, request service and pay for services rendered.

Mr. Alpha of the Gambia-Mattru Oil Mill and Mr. Bessima of Daru Oil Palm Company then spoke in turns both being in the same business and facing almost the same problems. They spoke of too many small plantations that cannot be profitably managed. They spoke of the Pioneer plantations which were not profitable and mentioned that they were owned by the SLPMB and that even SLPMB was in the process of giving them up. They said in their individual contribution that germinators which were supplied to them cannot even be used, because germination has not been encouraged. They also highlighted other problems such as lack of transportation for workers, lack of proper housing and other normal utilities such as water, electricity, medical etc.

Mr. A. K. M. Sankoh of the SLPMB said he had very little to say but would like to inform participants that the Board was in the process of deciding what to do with the Pioneer plantations. He also said that the plantation at Masanki had already been handed over to the Prisons Department and that other plantations and mills are in the process of being handed over to the (ECRD) Eastern Clinic Rural Development, Mobai.

Mr. Sesay, Director of Prisons in his contribution said that if the plantation at Masanki was well managed independently on site with the right attitude and manpower resource it would be profitable concern. He also stressed on the necessity of proper care and attention of plantations to obtain the best results.

Commenting on CFC he said there are a lot of advantages to having the CFC and more so at Masanki. In his opinion, it would help human rehabilitation as well as attract migration to the area. He said that the Prisons Department had interest in making use of all the existing facilities which are lying idle including the building which housed the former Mabang Agricultural Academy at Mabang, but that negotiations broke down when a clause was pointed out in the "Will" which stipulates that the building must be used to house Christians only.

Mr. Dumbuya of PIMSU/Ministry of Agriculture and Forestry in his contribution stated that they would not be interested in the CFC for the following reasons:-

a) as agents for Daru and Gambia-Mattru Oil Mills they had recently concluded negotiations with a French Firm to carry out maintenance;

b) the World Bank has approved funds for the reactivation of both projects which may be merged into one Company with private equity.

Dr. A. D. Monteiro, Chief Technical Adviser from the UNIDO at the Ministry of Trade and Industry, raised the issue about the present palm oil contribution of Daru and Gambia-Mattru Oil Mills to total national production which is reported to be 10% and which can likely reach 30% at mill full capacity, leaving the 70% balance to be covered by small mills and rural oil processing development. If these two Mills accounting for a small portion of total production of the country are not interested in the CFC, it should not be construed that 70 to 90% of the total national production should not have this facility. Furthermore, he pointed out that the proposed CFC would assist small millers, and village oil extractors to improve their production methods and thus contribute to raising the quality of their life. He also pointed out that the CFC will develop and fabricate small-scale rural mills using appropriate technology and contribute to the development of village and small-scale industries in this important activity.

On this question of Mr. Contreras, Senior Industrial Development Field Adviser of UNIDO in Sierra Leone, Mr. Dumbuya however agreed that the CFC was an excellent idea as it would most certainly help to improve the performance of Pioneer Mills resulting in an increase in palm oil production.

Dr. Giacovazzi noted that if Daru and Gambia-Mattru Oil Mills could enlarge their activities up to the point to provide assistance to the other Mills and rural enterprises it would have been welcome as it is not important who is providing such assistance as long as such assistance is provided. The general consensus was that the CFC was a good idea and should be pursued. Mr. Dumbuya strongly supported the concept. Mr. Alghali suggested that a properly presented request for assistance to establish the CFC is likely to get favourable response from the EEC/EDF.

Mr. Kakonge of the UNDP added that a co-ordinating unit was needed as a private enterprise for financial and other inputs.

Mr. Younes of MRU added that there was need for planning, a global strategy and objective of what was to be achieved and what were the means towards achieving this goal.

In summarising, Mr. King, PIDO, Ministry of Trade and Industry, thanked participants for their valuable contribution. He made mention that the Permanent Secretary had said that we should lay emphasis on agricultural sector rather than industrial sector. He reminded them that the outline they had received before the Meeting should be used as a Working Paper and that he was asking participants to please send in their comments and recommendations to the Permanent Secretary, Ministry of Trade and Industry. These pieces of information will be collected and brought to the level where it can be presented to Government.

There being no further business, the Meeting ended sine dine at 12.36 p.m.