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Uganda 617-0104

FINAL REPORT

BY

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We have examined, within the time contraints involved, a number of industrial and agro-industrial firms which impinge on the agricultural sector and so would affect the agricultural strategy of the Uganda AID Mission. These are as follows (not necessarily in the order of the time of the visit or of the importance of the industry in this report):

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| UGMA | Iron and Steel Fabrication, Foundry |
| Uganda Hoes, Ltd. | Forging Hoes |
| East African Steel Co., Ltd. | Semi-Integrated Steel Mill |
| Dunlop Tires | Bicycle Tires |
| Uganda Bag and Hessian Mill Ltd. | Bags and Hessian Cloth |
| Tororo Industrial Chemical and Fertilizer | Phosphate Fertilizer |
| Lint Marketing Board | Edible Oil and Soap |
| Emco Oil Refineries Ltd. | Edible Oil |
| Madhvani Soap Industry, Ltd. | Soap |
| Uganda Feeds, Ltd. | Poultry and Cattle Feed |
| Madhvani Sugar Mill | Sugar |
| Associated Battery Manufacturing | Lead/Acid Automobile and Truck Batteries |

| | |
|---|---|
| United Carbide Co. | Dry Cell Batteries |
| Casements, Inc. and Others | Steel Products, Barbed Wire, Corrugated Iron Sheets, Nails, etc. |
| Uganda Fish Net Mfg. Co. | Fish Nets |

Each of these visits, in some cases more than one visit, included a more than casual examination of their facilities and close questioning about their source of raw materials, processing and subsequent sale of items produced. A very consistent pattern of breakdown in maintenance and unavailability of raw materials was seen. The maintenance problem is of course attributable to the domestic turmoil of the past twelve years or so and the unavailability of replacement parts. Most of the raw material problems arise from the necessity for importing materials which are not available due to the shortage of foreign exchange. Most of the firms were operating at a fraction of their rated capacity, handicapped in many cases because spare and repair parts were not available, either because they were non-existent in-country or foreign exchange was not available to import them. We found all of the officials ready and eager to operate their facilities and in all cases we found that the management group recognized their problems, were doing their best to "make do," and trying to obtain the necessary equipment and commodities from whatever source. We were very careful to make no promises of material help although we indicated that their capabilities and needs would be recorded and presented in this report. In no case did we find that the present management had been installed for political convenience. We came away with a higher regard than we expected to find for the capabilities and the

enthusiasm of the management group.

We are of the opinion, however, that each firm has detailed their needs at length in a long "wish list" of both commodities and repair parts or spares. It is our opinion that each industry would be better served if they realized and accepted the fact that funds for all their needs are not available in the immediate future and/or within the fiscal year. UGMA has done this at our suggestion. We are apprehensive that the Uganda Development Bank (UDB) will become bewildered with such a long list, the inadequate funds to support these demands, and will be inclined to be arbitrary in the allocation of the available funds. Such an action might discriminate against one industry as against another and even result in the delivery of items not fully useful without other items deferred for future delivery.

Philosophically, we are concerned with an apparent obsession of most of the industries to rebuild their facilities in a mirror image of their existence in 1970. With changes in the energy situation since then, changes in machinery and techniques and even markets lost forever (viz: possibly cotton), money might be utilized to breathe life into a redundant process or product. However, the present situation is in effect an emergency and it is probably not possible to examine each situation insufficient depth to obtain the ultimate efficiency in the distribution of funds.

We list below a synopsis of each industry visited and our view of the industry's place in the rehabilitation process. We placed emphasis on agricultural impact, the source of raw materials, the production process, and our view of the market for the product. Recommendations for AID action follow in a separate section.

1. UGMA and Uganda hoes; (Lugazi and Jinja respectively) At this time both of these companies have problems. UGMA has broken and worn hoe dies and especially needs spare parts for the forging presses (to be replaced under the IDA Rehabilitation Loan). UGMA is experiencing LC difficulties and there will be a delay before new hoe dies are received. Spare parts are on the way. We have learned that the LC for the forging dies has been extended for four months but this may not be long enough for the die steel to be obtained by the German vendors and for them to manufacture and ship the dies. In the event the die delivery does not meet the new deadline, that the renewal of the LC may be given priority in the second tranche of the IDA Rehabilitation Grant. In the meantime, REDSO is considering the ordering of a set of hoe dies from the German manufacturer on a procurement waiver basis and it may be possible to have the dies in two or three months. The IDA Rehabilitation Loan die order should be allowed to stand in any event as it is sensible to have a spare set of dies to assure uninterrupted production.

Uganda Hoes is operating one line quite adequately but is handicapped by an immediate shortage of steel causing them to stretch out production to keep available labor employed. Both companies depend upon imported flats to operate. Uganda Hoes has a consignment of AID CIP flats which will be exhausted about June 1. Unless this shortage is remedied, there will be a delay in production for several months until a consignment of 4,000/MT of flats arrive under EEC auspices. Chillington (UK) took over late in April and have corrected some obvious errors in management already. They have a management contract and will not only activate a second line of forging machines but will replace the present oil-fired billet heating furnaces with

electrically heated furnaces for which they have already had assurances of the additional electric power necessary.

We have confirmed the 4,000/MT quantity with the local EEC office but there will be a delay in delivery for up to six months. The problem is that the EEC needs a guarantee from the GOU for their "loan". It is for ten years at one percent interest and in all probability will be cancelled by the EEC at the end of that time so, in effect, it is a donation. However, the EEC understandably wants some GOU responsibility for the steel until the ultimate hoes are in the hands of the Cooperative. So far, this parliamentary guarantee has not been granted but only when it is in effect will the flats be ordered. They will be produced promptly and shipped ASAP but obviously there will be some delay. Incidentally, this "guarantee" procedure might not be a bad idea for AID, particularly in view of the problems encountered to date at Uganda Hoes. They expect to increase production, starting in three to six months, to the rate of one million hoes a year. They will possibly increase this quantity, depending upon die life, labor availability and their ability to increase the efficiency of the operation.

UGMA has die and press problems, as mentioned above and elsewhere, and will need continuation of the AID CIP program for hoe and other hand tool production for the foreseeable future. They have a fabrication plant which is in need of spares and repair and it is likely that eventual assistance from the IDA Rehabilitation Fund will return them to the status of one of the best fabricating plants in East Africa. The foundry and three ton electric furnace are in need of spares and repair but the latter, because it is old equipment, is having difficulty in obtaining parts. The foundry is operating a small

cupola but appears to be doing quite adequate foundry work. Some of the items being produced (cane crushing rolls, for instance) are unique in Africa and can be the foundation for an almost monopolistic and profitable business.

The market figures for hoes are elusive. The Cooperative people indicate a present demand for seven million hoes. Other estimates are in the five million range. We are inclined to think that the latter is a more likely figure. The annual demand for hoes after the current put-up demand is satisfied is likely to be in the two million a year range in the estimation of the hoe producers. The Cooperative figures are somewhat higher. But, until the demand is satisfied and the black market disappears, no reliable figures are possible. There is a problem not only with the black market in hoes but the market figures may be distorted with the importation of hoes by the volunteer agencies and others and an informal export market of black market hoes. Since the manufactured hoes are transferred to the Cooperative for sale, and the sale of hoes to the Uganda Hoes employees has reportedly been stopped, it is likely that the slippage is beyond the receipt of the hoes by the Cooperative. In any case, it is unlikely that AID can be the factor at fault in the existence of a black market in hoes.

2. <u>Dunlop Tires</u>: (Jinga) This plant has been shut down for several years. The owners/operators left Uganda about 1979 and so far have resisted returning to operate the plant. We are told the negotiations are underway. The machinery has been well-kept and with very little effort could be back in operation to make bicycle tires, tubes, adhesives and rubber cement, their former products.

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Bicycle tires and tubes are very essential to the agricultural effort and are an important means of transport of people and burdens. As an index of the need for bicycle tires and tubes, we were told that the black market cost for bicycle tires and tubes was UShs/3000 and UShs/1000, respectively--US$/50 or so for the two. Dunlop could sell tires and tubes at about UShs/700 for both (US$/9) and make a profit. All raw materials are imported and very little are on hand. Production is by conventional tire building and vulcanizing and tubes are made by extrusion and vulcanizing.

The demand for these rubber products is unknown but since the black market price is so outrageous, there should be a good demand. A production of 500,000 tires and 450,000 tubes is reasonable initially and could probably be doubled with raw materials source increased, but a pent-up demand may distort these figures until the black market is eliminated.

3. Uganda Bag and Hessian Mill, Ltd.: (Tororo) This is the only plant which operated during the troubles but it was shut down for all of 1981 for lack of the imported jute, because no foreign exchange was available. The factory uses, at present, jute of less than optimum quality imported from Bangladesh. They use conventional carding and spinning machines to make a yarn which is used for both bag and Hessian cloth manufacture. The factory is in good condition with many idle machines. These, it was said, could be operative without much difficulty. The plant is operating at about 25% of capacity. Full capacity is 6000/tons p/a of jute to produce about 5400/tons of bags and cloth, using three shifts, six days a week.

There is a question of whether this bag production would eventually

meet the Ugandan requirements for coffee, sugar, feed and grain shipments and cloth for cotton baling. However, if they could get all the raw material they could run at capacity. This will depend, of course, on the increasing revival of the coffee, sugar and cotton production and the ability of these crops to satisfy local demand and have a surplus for effort.

There is a separate section attached which will discuss the possibility of the substitution of locally grown kenaf as a replacement for imported jute.

4. Tororo Industrial Chemical and Fertilizer: (Tororo) This plant has been shut down for several years and is in deplorable physical condition. It was the only manufacturer of single super phosphate in East Africa but it had to shut down for the usual reason, lack of spares and repair parts, and inability to obtain a vital ingredient, sulphur. The original supply of sulphur came from Kilembe Minès. When they shut down in about 1979, this source dried up. There was no other source than import, and foreign exchange was not allocated. Hence the shut down and, because of the acid environment, the plant deteriorated more rapidly than normal.

While we were at the plant we met three geologists employed by Bearden-Potter of Lakeland, Florida, U.S.A., who were starting a 31-month study to rehabilitate the plant with the object of making triple super phosphate. The first half of the study is a feasibility study to be followed by a formal process plan. The study is being financed with IDA assistance. The present acid plant (which the 1979 Commonwealth Report indicated might be salvaged) is beyond repair and will be destroyed. We were most interested in

the situation because a by-product of the plant would be a valuable magnetite iron ore concentrate. Since the value of the magnetite is an add-on to the advantage of rebuilding the plant, the situation should be followed closely particularly since a badly needed source for iron besides scrap exists. (See further remarks under Iron and Steel Appendix comments.) It is quite obvious that phosphate alone does not a complete fertilizer make. The nitrogen and potash portion can follow as and when more money is in sight. In the meantime, triple super phosphate is a valuable product for export, and of course in-country use.

5. Edible Oil and Soap: (Lint Marketing Board at Tororo) EMCO Oil Refineries at Jinja and Madhvani Soap Industries at Jinja. The only crushing being done in these plants was of 1979 crop cotton seed which had been withheld from the market by the farmers until prices for it were adjusted. Oil yields are low and high in free fatty acid (generally above 20% and sometimes above 30%). This is okay for soap manufacture and some soap was being made (and sold at a high price). The cooking oil portion was refined, in some cases inadequately. With the oil selling at about U.S.$/9 per liter the demand for more is quite obvious. All the mills can crush any oil seed--soy, cotton, sunflower, palm, sesame--in fact anything but castor beans, although the Madhvani mill has a segregated sector for castor also. The problem is supply of seed, of course, and until oil seeds, preferably soy because of its leguminous nature, is available, rebuilding the oil mills might be a lessor priority. We saw only expellers in use although the UDB people said some old hydraulic presses were still in use (which should be junked

forthwith). The expellers were old (1940 in one case) and are used because there is nothing else available. Their efficiency is very poor and an excess of valuable oil leaves the plant with a high oil content press-cake. A solvent extraction add-on for the inefficient expellers would make economic sense.

6. Madhvani Sugar Mill: (Jinja) This mill like all the others is operating at significantly less than capacity. Like all the others it produces crude granulated sugar and not white sugar. The plant is plagued by a shortage of cane but the fields are being rehabilitated on an orderly basis. The mills are in poor shape for lack of parts and repairs. The UDB looks to using the World Bank Rehabilitation Grant and other sources of foreign exchange to make the mills more efficient. Presumably, they are looking to the export of sugar to increase foreign exchange but there is a good question in our mind whether this is the economical course to follow. The price of sugar is relatively low and the mills will have trouble making money under present circumstances. To spend a lot of money to produce sugar--and white sugar at that--appears to be putting the cart before the horse. Until an adequate cane supply, is in sight improvements in mills and refineries should take a lower priority. One encouraging note is that the Madhvani Mill is interplanting soy beans with their cane and will plant 4000 acres in soy beans for a few years until the area is needed for cane. This will assist their oil mill operation. Since they plan to harvest the beans by hand, it seems to us a precarious operation from the economic viewpoint.

7. Associated Battery Manufacturers: (Kampala) This is discussed in a separate appendix. The potential foreign exchange saving is significant and can be obtained in a rather easy manner.

8. United Carbide Co.: (Kampala) This has been shut down for several years, although the machinery is well preserved and has been maintained in good running condition. Even using imported zinc bodies, they could sell a flashlight battery for about U.S.$/0.40.

The black market cost today is over U.S.$/1. Again, foreign exchange to buy the cans from Germany is not available to them. They propose extruding zinc strip themselves and producing slugs which could be impact-extruded in a machine delivered in 1979, partially looted, but which has never been unpacked. Records of the contents have been lost, but with a small input of parts and repairs, plus foreign exchange to buy zinc, they could be back in business and would be a foreign exchange earner. A sister company makes barbed wire and staples but has been shut down because imported galvanized wire is not available for the usual reason.

9. Uganda Fish Net Manufacturers: (Kampala) This plant is alive and well and can produce 400,000-500,000 nets per year, each 90 meters long by about two meters wide, of varying mesh size and of various piles. A very recent shipment of about 100 tons of Japanese nylon filament is being used and the plant seems to be most efficient. Our interest in the enterprise was because nets will be needed if the fish meal plant trawlers are to be activated. This plant does not have the ability or talent to make complete

trawler nets but they said local talent for such work is available in the fishing community around Lake Victoria, using component nets of standard sizes.

10. There are a number of small steel fabrication mills which make wire products, nails, G.I. sheets, beds, fencing, barbed wire, etc. We do not think these plants require detailed support at this time from AID or the lending agencies. It is likely that they will revive as and when iron and steel products become more available, together with, of course, the necessary foreign exchange to buy imported ingredients which are not available locally.

APPRAISAL AND EVALUATION OF PROGRESS OF ASSISTANCE TO UGMA AND UGANDA HOES

Both of these companies have received donor shipments of steel flats to continue the manufacture of hoes and continuation of this program is essential if the agricultural handtool pent-up demand and continuing normal demand is to be met. UGMA has spare parts in sight to repair their forging process which has contributed to the deplorable condition of these forging dies. A new set of dies is on order but is delayed by problems with the expiration of the letters of credit before shipment can be made physically.

To some degree the die problem is the fault of UGMA itself. They do not know the analysis of the steel in the dies and have made no effort to determine it. Consequently, they have re-faced the dies with an all-purpose electrode facing which is obviously not compatible with the die steel. Consequently, there has been early failure and even breaking of one of the dies. In the meantime, a LC problem under the IDA credit caused the vendor to cancel the order. (See previous remarks on this subject.)

The whole die situation has been stalled because of a misunderstanding of their cost. An alternate bid from a Kenya source seems out of the question because of a great price discrepancy and extended delivery. The best thing to do is to continue to do business with the German vendor.

There is less than 200 tons of AID flats in sight at UGMA. Uganda Hoes has been using AID flats and will run out of them about June 1. Thereafter, we expect there will be a hiatus until an expected 4000/MT of flats arrive as a contribution of the EEC. (See previous remarks on this

subject also.)

In the meantime, Chillington has signed a management contract to manage Uganda Hoes and the new manager took over about April 22. The former manager was absent as usual and the accountant was absent also. Add these unexplained absences to the fact that no deposit had been made in the Uganda shilling Special Account in April despite acknowledged delivers to the Cooperative and it could be that some money has been lost on the way to the bank.

Chillington is said to have withdrawn the privilege of allowing employees to buy 16 new hoes each per month--which probably promptly found their way to the black market. The privilege of buying the new hoes instead of "defective" hoes was instituted recently because it was found that the workmen deliberately made defective hoes because they were only allowed to buy such hoes rather than new ones.

Chillington was alerted to a possible discrepancy in the sale of the scrap which we had heard was sold for UShs/1200 (about U.S.$/15) per MT, which is a ridiculous price. They will also repair the press which has held up operation of the second line, rather soon. They will also replace the oil-fired heating furnaces with electric furnaces, the current for which has been assured. As soon as the 4000/MT arrive Chillington will have two lines on at least two shifts (if the labor is available) and should produce about 1 to 2 million hoes p/a starting when the EEC steel is available. As stated, they will run out of AID CIP steel about the end of May.

In connection with the continued supply of flats by AID, East African Steel has proposed that present flats suppliers buy and import 100/mm x 100/mm

x 4/m billets of appropriate analysis. East African Steel has enough excess rolling capacity to convert these billets for a toll fee of U.S.$/212 which could save U.S.$/38 at MT overall if the present price is USh/650/MT. But, the toll fee could be paid in UShs from the AID Special Account which would be reimbursed as the hoes were sold to the Cooperative. Assuming billets were available at U.S.$/400/MT F.O.B. Jinja, there would be a saving in dollar expenditure, of course, but by using the UShs for toll payment about 62% more tons of steel could be purchased with the same U.S.$ outlay. This would increase the supply of steel to the hoe companies and increase the supply of hoes and have no effect on the Special Account. We urge prompt consideration of this maneuver if additional flats are contracted for. A copy of the East African Steel proposal is attached. Their proposal for production from scrap is seems dubious because of price discrepancy and due to lack of scrap and melting capacity.

UGMA has a significant quantity of shovels on hand which they have not been able to dispose of to the Coops. This is partly due to a problem of not being able to obtain handles, necessitating their manufacture on inappropriate machinery, but also, we have heard, because the Coops have not been able to sell shovels to consumers. Perhaps this is the time for UGMA to withhold manufacture of shovels, picks and axes if the market is sluggish for these items and concentrate their production on the more urgently needed hoes.

An evaluation should be made of the disposition of the steel on-hand at both UGMA and Uganda Hoes, particularly in view of the fact that an additional 200 tons of AID CIP flats is in sight. Since Uganda Hoes is operating and UGMA has die and press problems, it might be sensible to divert

part of the incoming 200 tons to Uganda Hoes. The latter is faced with a period of idleness between the time they exhaust their current supply of steel and the time of arrival of EEC steel.

This may be the time also to start an evaluation of whether the current marketing system through the Coops is the best way to distribute hand agricultural tools. If the above situation is any indication of marketing problems, perhaps the manufacturers could revert to a former method of distribution which by-passed the Coops to a large extent. Such a marketing practice could result in a higher profit to the manufacturer, particularly in the current shortage situation. Working capital and cash flow would be important in making such a decision.

THE FLAT BARS FOR WELLINGTON AND UCHA

I From Imported Scrap and Inputs like Ferro Alloys/Fluxes/Electrodes/Refractories e.t.c.

a) Price of Imported Scrap is takes as US$ 200 CIF JINJA

Cost per M/Tons of Ingots produced comes to 442 US$. PER TON

b) CONVERSION COST of Ingots to Finished HOE FLAT BARS in the Rolling Mills comes to 385 US$ Per Ton

Total Cost of FLATS including Profit Margin of 25% from Imported Scrap thus comes to US$ 827 PER M/TON (melting capacity is takes as 350 M/TON per month)@ 20% CAP.

II FROM IMPORTED BILLETS:-

a) Price of Imported Billets is taken as US$ 400 per M.TON

b) Conversion Cost from Billets to Finished FLATS comes to US$ 212 per M/TON.

Total Cost of Flats including Profit Margin 25% comes to US$ 612 PER TON

Rolling Mill Capacity is takes as 880 Tons per Month which is 50% CAPACITY utilisation.

Therefore alternative II is preferred reasons

(I) Capacity utilisation is higher by 30% leading to lower unit costs.

(2) Melted Ingots to FLATS Cost = 827 US$ PER TON

Imported Billets to FLATS Cost 612 US$ PER TON

SAVING COMES TO US$ 215 PER TON

If we make Ingots ourselves we will be only Rolling FLATS, since Steel Melting Capacity is at present restricted to MAX 25% of capacity.

Whereas if the Imported Billets are Rolled in the Rolling MILLS Capacity utilisation will be about 75% Max.

Best alternative therefore is to utilise our Local Scrap for melting steel to suit Reinforcing Steel Bars Structewels and WIREROD, Bailing FLATS.

and supplement the Rolling Mill Capacity by indication of Imported Billets to produce HOE FLAT BARS, at a cheaper price. The condition of the Plant and equipment in the Steel Melting WILL Not permit the Plant to exceed its existing capacity utilisation.

## POSSIBILITIES OF EAST AFRICAN STEEL CORPORATION JINJA (MADHVANI GROUP) TO SUPPLY RAW MATERIAL TO UGANDA HOES (CHILLINGTON).

Uganda's agricultural machinery manufacturing sector will have to be integ with existing engineering production facilities and steel industries. The on steel industry in Uganda is East African Steel Corporation Limited which be regarded as the manufacturer of input to construction industry, engineeri industry and agriculture. In this context the Corporation has potential to contribute to the Uganda agricultural machinery production programme. Th for appropriate policy actions and necessary support. This Corporation used supply to Messrs. Chillington the raw material in the form of flats. As a of fact complete supply of the basic and only raw material for Messrs. Chill was undertaken by us in the past. The flat's supplied by us are cut to small of approx 2.5 kgs, heated in an oil fired furnace and then in subsequent forg pressing/punching operation, 8 steps it produces hoes. One piece of cut fla produces one hoe. 500 hoes are produced from one tone of flats.

Facilities at East African Steel Corporation Limited is enclosed. At pres the Corporation is only producing mild steel sections for construction indust cotton baling strips, bolts and nuts and oxygen.

Uganda immediate needs 500,000 pieces fully finished hoes. Instead of impor fully finished hoes from abroad or even importing steel flats, which is the ma raw material for making hoes, a better and the only proposition is to import 100 mm - SAE 1045 Steel Billets 4 meters long at approx. $ 600/ton. 3500 of Billets could be supplied to East African Steel Corporation Ltd. at Jinja. To cut these Billets into unit length of 1.3 meters oxygen/actylene cutting ma also has to be imported at a cost of $ 60,000. We can then convert these bil into steel flats and supply (with due consideration to the conversion cost, wh will be in local currency and to be worked out) within 2/3 months approx 1.0 (50% of the installed capacity of Messrs. Chillington), hoes can be produced from these flats.

This will keep the East African Steel Corporation fully occupied for 4 with imported billets and rest of the time with mild steel production from scrap metal available. In addition to 3500 tons of import of High Carbon Fla and Oxygen cutting machine, we will need some infrastructure facilities for our Rolling Mills in way of spare parts and consumables.

....2.

## STEEL BILLETS SPECIFICATION - SAE 1045:

| | | | |
|---|---|---|---|
| Analysis | C | = | .40 - 0.50% |
| | Si | = | 0.30 Max.% |
| | Mn | = | .60 - .90% |
| | Ph | = | 0.05% |
| | S | = | 0.05% |

Section 100 mm Billet.

Length 4 meters (or 6 to 9 meters).

## PROCESS:

Imported 100 mm Billets as per above analysis will be cut into 1.3 meters length and will then be charged in our 10 tons per hour Reheating Furnace and heated to Rolling temperature. This then will be rolled through our Three High Roughing mill followed by a Three High intermediate mill to finish the Billet into 95mm x 17.5mm flats, which is the raw material for Chillington hoes.

(P. R. MERH.)

# JINJA - UGANDA.

## BACK GROUND.

This steel plant the only of its kind in then East African Community was developed by Madhvani Group of Industries in 1961.

The Government took over the plant in 1972 and handed it back to the Madhvani Group in March 1980 as "East African Steel Corporation Ltd." Jinja, with 51% Government shareholding and 49% Madhvani Group, the Management resting with this Group.

## INSTALLED CAPACITY.

25000 Tons/Annum of Ingot steel.
18000 Tons/Annum of Rolled products.
1000 Tons/Annum of Cotton ties.
1000 Tons/Annum of Wire Drawn products.
100 Tons/Annum of Bolts and Nuts.
2000 Cu. meter/day of oxygen.

## FACILITY AVAILABLE.

12 Ton Electric Arc Furnace installed in 1962. Manufactured by Messrs. Leon Taghaferri, Italy.

Rolling Mills installed in 1963, consisting of:

i) Reheating furnace supplied by Messrs. Ofu Thermo, Italy.

ii) Three hi-Roughing mill supplied by Messrs. Pomini Farrel, Italy.

iii) Cross-country finishing mill supplied by Messrs. Pomini Farrel, Italy.

iv) Cooling Bed by Messrs. Pomini Farrel, Italy.

v) Flying Shear by Messrs. Danieli, Italy.

vi) Coilers by Messrs. Garret, Italy.

Strip Mill/Wire Drawing Plant installed in 1968 supplied by Messrs. Fenn Manufacturing Co. U.S.A. under the US Aid programme.

Oxygen plant in 1970 by Messrs. MESSER GmbH, West Germany.

Bolts and Nuts plant in 1973.

## RAW MATERIALS USED.

Steel scrap locally available.
Limestone locally available.
All other ferro alloys, fluxes, refractories, etc. to be imported only.

...2.

PRESENT CAPACITY UTILISATION.

20% of the rated capacity.

FUTURE PLANS.

Rehabilitate to rated capacity.

CONSULTANTS.

W.S. Atkins & Partners, U.K.

JINJA.

## REVIEW OF UCB AND UDB ACTIVITIES

It has been most difficult to get a clear expression of a current loan portfolio from the Uganda Development Corporation and the Uganda Commercial Bank in the time of this consultancy. We interviewed the Uganda Development Bank at some length and a commentary on their staff of analysts and appraisals is in another appendix.

We went to UDB first because they are commissioned to handle all loans for medium and large scale industry and to leave the projects of less than U.S.$/300,000 foreign exchange plus local currency to be handled by the Uganda Commercial Bank. We found the UDB people to be knowledgeable about the projects in prospect and those financed and to be financed through the current World Bank Rehabilitation Loan. However, the depth of knowledge of manufacturing processes and especially new processes was, in our opinon, somewhat deficient. We were concerned that they confined themselves to the simple rehabilitation of industries in their former image, without questioning whether their industries were still appropriate priorities in the changed economic environment. Also, there was no effort that we could see to reduce imported energy requirements, nor emphasis on saving foreign exchange.

To be sure, the UDB has applied to the IDA Technical Assistance Project - 1077-UG for the cost of 30-man months of training for the analysts of the Bank. In addition they have asked the IDA for assistance in selecting the expatriate consultants who would do this work. (A copy of the application is attached.) However, this work is to cover only ten projects and the list of projects to be funded by the World Bank Rehabilitation Grant is certainly

longer than that. Education is a slow process and the need for considered action is here and now.

We considered the question of AID using the UDB, for instance, as a conduit for channeling assistance to industry. This may be the only port in a storm but attention should be given to whether selected projects are within the ability of the Bank analysts and appraisers to handle. Even assuming that the financial management systems at UDB is adequate, we have doubts about the ability of this Ugandan agency being able to concentrate assistance in a direction compatible with AID objectives. Our feeling is that the need in Uganda is so great for financial assistance, that without specific AID oversight, assistance might be sprayed too thinly over too wide an area in response to the vociferous pleas of the many applicants who need help.

With reference to the UCB (the principal lender to small industry), we have been given a gross list of sectors with the projected requirements for both foreign exchange (in U.S. dollars equivalent) and the local currency requirement for machinery and equipment. This list covers six months requirement for imported raw materials and spare parts of about U.S.$/50 million. These sectors range from art work through flour and jaggery mills to beverages and photography. We understand that the second tranche of the World Bank Rehabilitation Grant will have a portion of it--perhaps U.S.$5/million--set aside for re-lending to small industry. This, we understand will be channeled through the Uganda Commercial Bank. In the meantime, the UCB has had <u>no</u> foreign exchange from which to make sub-loans to small industry. Without this ingredient, most UCB loans are not viable. Almost all of the lendable local currency available within the UCB, from one

source or another, has been used to finance jaggery mills and small maize mills. The practical result of this situation is that no loans, other than the two types mentioned above, have been made to small industry by the UCB for some years. A singular weakness of the Bank, aside from monetary problems, is the admittedly poor performance of the analysis and appraisal staff. We spoke with the senior head of credit of the UCB and he made the flat statement that their present loan portfolio was in poor shape with significant delinquencies. This was mostly due to inaccurate viability decisions of the staff. Judgment of managerial skills was said to be the chief problem in small industry financing. We suggested that the UCB participate in the UDB application for consultant assistance referred to above. To reply to the direct question, we think the UDB is a doubtful candidate for a conduit of AID projects of funds and the UCB is presently an even weaker candidate.

A further discussion of the UDB proposed use of the second tranche of the World Bank Rehabilitation Loan is in an appendix to this report, under the discussion of proposed lending projects of the UDB.

IDA Technical Assistance Project - 1077 - UG

Application by Uganda Development Bank for Consultancy Services

1. JUSTIFICATION & SCOPE

Uganda Development Bank was established in September 1972 and charged with the promotion and provision of short, medium and long term development finance and to render managerial, technical and administrative advice and services to projects in the agricultural, industrial and commercial sectors of the economy.

In the aftermath of the war of liberation and attendant destruction, it is envisaged that Uganda Development Bank will play a prominent and expanded role particularly in the mobilisation of requisite external funds and provisions of finances generally to projects under the rehabilitation, reconstruction and development programmes.

To achieve these objectives, the Bank greatly needs capital and technical assistance. The proposal for technical assistance to the Bank was first identified in 1972 and was subsequently reflected in UNDP's Annual Review of the first Country Programme. Unfortunately, a number of circumstances did not permit execution of the proposal, with the result that the Bank was established and has hitherto been maintained without technical assistance in key sectors as originally envisaged.

Over the period of its operations, U.D.B. has built up requisite project preparation and appraisal capability and manpower. However, because of lack of training facilities for its personnel and the magnitude a complexty of the technical appraisal capacity necessary for the Bank to handle a growing volume and complexity of projects, the existing Bank appraisal capacity and capability requires immediate strengthening.

This project, therefore, is designed to provide technical appraisal capability to the Bank in the appraisal and preparation of some of the projects immediately due for financing under the World Bank Industries Rehabilitation Line of Credit itemised in Annexture A hereof. This will be done firstly by providing consultancy services to the Bank to assist with the technical appraisal of the more complex of Annexture 'A' projects

2. TERMS OF REFERENCE:

The terms of reference for the consultant will broadly include:-

(a) Technical/Engineering

(i) Determination and review of the investments in plant, machinery, equipment, spare parts, and transport facilities that are needed to restore the technical capacity of the project to produce efficien

(ii) Determination and review of sources of procurement and other procurement arrangements for these items.

(iii) Determination and review of detailed cost estimates for the items to be procured.

(iv) Determination and review of implementation arrangements for the proposed investment.

(v) Review of the competence of technical and engineering personnel available for running project once rehabilitated, and proposing measures to provide adequate technical management where needed.

(vi) Determination and review of sources of raw materials, for optimum operation of project after rehabilitation.

(b) Financial

(i) Assisting in the assessment of the financial condition of enterprises by reviewing their assets and liabilities, asset revaluation reports, and inventories of debt.

(ii) Making proposals for financial restructuring of these enterprises. Options to be examined will include liquidation and reincorporation of entities; recapitalisation; and debt rescheduling and/or cancellatio

(iii) Assisting in preparation of financial projections of enterprises based on the proposed rehabilitation investments, assessing financial risks and debt servicing capabilities of enterprises.

(iv) Assisting in determining the financial return on these investments.

(c) Economic

(i) Assisting in determining comparative import prices of items to be manufactured by rehabilitated projects.

(ii) Assisting in estimating foreign exchange to be earned or saved as a result of production by rehabilitated projects.

(d) The final list and scope of services will be determined and agreed between U. D. B. and the World Bank from time to time.

3. PROJECT COSTS:

The required consultancy services will cost a total of US.$. 396,00 phased as hereunder. All costs are to be paid with funds from the IDA Technical Assistance Credit :-

| | | Total | | 1982 | | 1983 | |
|---|---|---|---|---|---|---|---|
| (a) | Consultancy services for appraisal and preparation of 10 projects | m/m 30 | $ 360,000 | m/m 9 | $ 108,000 | m/m 21 | $ 252, |
| (b) | Contingency | | 36,000 | | 10,800 | | 25, |
| | Total | | 396,000 | | 118,800 | | 277, |

4. INDICATIVE CONSULTANTS

(a) The following consultancy firms have provisionally been contacted or identified by Uganda Development Bank as having the requisite competency to provide the required consultancy services in accordance with the terms of reference.

| | | | |
|---|---|---|---|
| (i) | P. E. International Operations Ltd. | - | United Kingdom |
| (ii) | Arthur D. Little Inc. | - | U.S.A. |
| (iii) | Tata Consultants | - | India |
| (iv) | Planco Consulting Gesellschaft MBH | - | West Germany |

(b) Uganda Development Bank will seek IDA assistance in identifying three (3) more suitable and competent firms for inclusion on a final list of seven (7) consultancy firms from which bids will be invited.

5. SOURCES OF FINANCE FOR INVESTMENT PROJECTS

The consultancy services will assist Uganda Development Bank in the appraisal of about 10 projects to be funded under the World Bank Industries reconstruction line of credit to Uganda Development Bank. The indicative amount of the credit is over US. Dollars 20m and final agreement will be entered into in April 1982.

In addition, the European Investment Bank has indicated the possibility to lend to UDB an indicative loan of about US. Dollars 10 million either for co-financing the World Bank Programme or independently for rehabilitation and or development of other industries in Uganda arising out of the consultancy services.

6. IMPLEMENTATION & PROCEDURES:

1. The engagement and utilisation of the consultancy services shall be in accordance with the following time table and procedures:

| | | | |
|---|---|---|---|
| (a) | Invitation & Evaluation of proposals from the final indicativ list of consultancy | - | May/June 1982 |
| (b) | Negotiations with consultants | - | June/July 1982 |
| (c) | Selection of consultant and contract after clearance by the Ministry of Planning & Economic Development and the World Bank | - | July/August 1982 |
| (d) | Project appraisal and preparations | - | September/1982 to December/1983. |

UGANDA INDUSTRIAL REHABILITATION CREDIT

SHORT LIST OF 25 MEDIUM AND LARGE SCALE PROJECTS FOR REHABILITATION

| COMPANY/PROJECT | OWNERSHIP | PRODUCTS | ESTIMATED COST (US$ MILLIONS) FOREX | RAW MATERIALS | OTHERS | TOTAL | REASONS FOR INCLUSION |
|---|---|---|---|---|---|---|---|
| National Tobacco Corporation | Public | Cigarettes/Tobacco | 3.7 | 8.0 | 2.8 | 14.5 | Govt revenue and export potential |
| Nile Breweries | Public | Beer | 0.7 | 0.2 | 0.9 | 1.8 | Govt revenue and basic consumer product |
| Tororo Oil Refineries | Joint | Vegetable Oil | 8.[illegible] | 10.7 | 5.3 | 24.4 | Basic consumer product |
| Uganda Fishnets Ltd. | Public | Nets/twine | [illegible] | 0.3 | 0.1 | 0.9 | Input to fishing industry |
| Uganda Cement (UCI) | Public | Cements | 0.2 | 2.8 | 0.1 | 3.1 | Basic consumer product |
| Uganda [illegible] Co. | Private | Shoes | 3.5 | 0.8 | 0.1 | 1.4 | Basic consumer product |
| Uganda Leather and Tanning | Public | Tanned Leather | 0.1 | 0.1 | 0.6 | 0.3 | Input to shoe industry and export potential |
| Uganda [illegible] Industries Ltd. | Private | Mattresses | 0.2 | 0.8 | 1.3 | 1.3 | Basic consumer product |
| Pauli Sawmillers | Private | Timber | 0.6 | - | 1.2 | 1.8 | Key construction material |
| Stale Sawmills | Private | Timber | 0.2 | - | 0.9 | 1.1 | Key construction material |
| Lugogo Wood Works | Private | Treated Timber | 0.1 | 0.1 | 0.2 | 0.4 | Key construction material |
| Printpak | Public | Packaging Materials | 0.3 | 0.7 | 0.2 | 1.2 | Input to other industries |
| Sonja Tissues | Private | Sanitary Paper | 0.1 | 0.8 | 0.1 | 1.0 | Basic consumer products |
| Hima Cement Ltd. | Public | Cement | 5.[illegible] | 5.5 | 3.8 | 14.3 | Key construction material |
| East Africa Glass Works | Joint | Glass | 17.[illegible] | 1.3 | 2.1 | 20.8 | Input to other industries |
| Kakira Soap Works | Joint | Soap | 7.2 | 3.6 | 5.0 | 15.8 | Basic consumer product |
| Brothers Soap Industry | Private | Soap | 0.1 | 0.8 | 0.1 | 1.0 | Basic consumer product |
| United Tanners Ltd. | Private | Dry Batteries | 2.1 | 2.0 | 0.[illegible] | 4.1 | Important consumer product |
| Associated Battery Manufacturers | Private | Motor Batteries | 0.1 | 1.6 | 0.4 | 2.5 | Important consumer product |
| Steel Manufacturers of East Africa | Joint | Steel | 8.[illegible] | 5.0 | 8.1 | 21.1 | Basic construction material |
| [illegible] Engineering | Joint | Foundry & Workshop | 2.[illegible] | 7.5 | 1.8 | [illegible] | Key engineering repair facility |
| East Africa Steel Products | Public | Pipes | 1.7 | 0.7 | 0.7 | [illegible] | Basic construction material |
| Tempco | Public | Beds | 0.7 | 1.1 | 0.1 | 1.9 | Basic consumer product |
| Sembule Steel Mills | Private | Wire/Nails | 1.[illegible] | 1.3 | 0.3 | [illegible] | Key construction material |
| Tororo Steel Works Ltd. | Public | Iron Sheets | 0.6 | [illegible] | [illegible] | 2.1 | Key construction material |
| | | | [illegible] | 54.3 | 35.6 | 152.1 | |

Source: January, 1982

1/ 2 years spare parts, technical assistance, steel works and vehicles

Annex

## UGANDA INDUSTRIAL REHABILITATION CREDIT

## SUMMARY SHEET OF SMALL SCALE INDUSTRIES FOR REHABILITATION

| Sector/Activity | UDC Loan [illegible] 30.6/81 | Rehabilitation Requirements: Machinery & Equipment: Foreign Exch. US$ Equivalent | Machinery & Equipment: Local Currency | 6 Months Imported Raw [illegible] and Spare [illegible]: Foreign Exch. Only US$ | [illegible] |
|---|---|---|---|---|---|
| Art Work | 150,000 | - | - | 10,000 | |
| Bricks and Tiles | 2,000,000 | 3,970,000 | 24,000,000 | 347,000 | |
| Animal and Poultry Feed | - | 220,000 | - | 62,000 | |
| Garments and Textiles | 1,846,000 | 395,000 | - | 500,000 | |
| Soaps and Oils | - | 4,460,000 | - | 4,190,000 | |
| Flour Mills (Maize Meal) | 39,120 | 2,510,000 | - | 304,900 | |
| Jaggery and Sugar | 2,726,000 | 14,110,000 | 3,000,000 | 722,000 | |
| Engineering W/S and Foundry | 77,000 | 1,720,000 | - | 1,122,000 | |
| Saw Mills | - | 570,000 | - | 41,000 | |
| Bakery and Confectionery | - | 1,[illegible] | - | 435,000 | |
| Carpentry Shops | 190,000 | 935,000 | - | 145,000 | |
| Drugs and Cosmetics | 400,000 | 10,000 | - | 60,000 | |
| Cotton Mattresses | 65,000 | 70,000 | - | - | |
| Printing Press | - | 295,000 | 300,000 | 184,000 | |
| Cement Products | - | 495,000 | - | 35,000 | |
| Leather Tanning & Shoe Making | 187,000 | 3,500,000 | 3,[illegible],000 | 600,000 | |
| Bore Maintenance | - | 930,000 | - | 320,000 | |
| Lime | - | 620,000 | - | 62,000 | |
| S/Nut/Peanut Processing | - | 370,000 | - | 37,000 | |
| Citrus Juice Processing | - | 200,000 | - | 22,000 | |
| Paper Products | - | 30,000 | - | 3,000 | |
| Wire and Roofing Nails | 2,000,000 | 550,000 | - | 3,600,000 | |
| Suitcase Manufacturing | - | 200,000 | - | 60,000 | |
| Treated Fencing Posts | - | 50,000 | - | 70,000 | |
| Honey Processing & Candle Mfg. | - | 60,000 | 0 | 6,000 | |
| Cow Horn Products | - | 10,000 | 0 | 10,000 | |
| Tissue Papers | - | 130,000 | 0 | 200,000 | |
| Beverages | - | 200,000 | - | 80,000 | |
| Photography | - | 280,000 | - | 80,000 | |
| | 7,[illegible],120 | 38,650,000 | 35,650,000 | 13,2[illegible],000 | |

UGANDA INVESTMENT PROGRAMME 1981 - 1983

LIST OF PRIORITY INDUSTRIAL PROJECTS

| NAME | CATEGORY | OWNERSHIP | TOTAL INVESTMENT (US $ Millions) | PRODUCTS | REASONING BEHIND |
|---|---|---|---|---|---|
| SUGAR | | | | | |
| 1. Sugar Corp. of Uganda, Ltd. | A | Joint Venture | 29.1 | Sugar | Export Potential |
| 2. Kinyoni Sugar Works Ltd. | A | Joint Venture | 113.6 | Sugar | Export Potential |
| 3. National Sugar Works Ltd. | B | Government | 7.4 | Sugar | Export Potential |
| NON-METALLIC MINERAL PRODUCTS | | | | | |
| 4. Hima Cement Works | A | [illegible] | 10.5 | Cement | Invariable for consumer |
| 5. Soot Al[illegible] Glassworks Ltd | A | Joint Venture | 26.8 | Glass Bottles | Key Input to Beer & [illegible] |
| FOOD, BEVERAGES AND TOBACCO | | | | | |
| 6. Uganda Breweries Ltd. | A | [illegible] | 14.3 | Beer | Urgent consumer [illegible] |
| 7. Nile Breweries Ltd. | | [illegible] | 1.3 | Beer | Urgent consumer [illegible] |
| 8. Corn Oil Refineries | A | [illegible] | 34.1 | Cooking oil | Urgent consumer [illegible] |
| 9. National Tobacco Corp. | A | Government | 14.5 | Cigarettes | Government Revenue |
| 10. Lake Victoria Bottling Co., Ltd. | A | Government | 1.6 | Soft Drinks | Urgent consumer [illegible] |
| TEXTILES | | | | | |
| 11. African Textile Mill | A | Government | Not stated | Cotton Fabrics | Urgent consumer [illegible] |
| 12. Fembe Textiles Industries Ltd. | B | Government | 5.6 | Cotton Fabrics | Urgent consumer [illegible] |
| 13. Nyanza Textiles Industries Ltd. | A | Government | 7.2 | Cotton Fabrics | Urgent consumer [illegible] |
| 14. Uganda Fishnet | A | Government | 0.8 | Fishnet | Key Input to fishing [illegible] |
| 15. United Garment Industries Ltd. | A | Government | 3.0 | Garments | Urgent consumer [illegible] |
| PAPER & PRINTING | | | | | |
| 16. Tapco Industries Ltd. | B | Government | 11.2 | Paper | Funds already provided [illegible] |
| 17. Printpak | A | Government | 1.1 | Packets | Key Inputs to other [illegible] |
| 18. Kenya-Pistons | A | Private | 0.9 | Paper Products | Urgent consumer [illegible] |
| CHEMICALS | | | | | |
| 19. Tororo Ind. Chemicals & Fert. Ltd. | A | Government | 4.35 | Fertilizer & Insecticides | Key Input to [illegible] |
| 20. Associated Match Co., Ltd. | A | Government | 0.25 | Safety Matches | Urgent [illegible] |
| 21. United Carbide Ltd. | A | Private | 4.07 | Dry Cell Batteries | Urgent [illegible] |
| 22. Associated Battery Manufacturing | A | Private | 1.42 | Motor Vehicle Batteries | Key to road [illegible] |
| 23. Tokire Soap Works | A | Joint Venture | 15.6 | Soap | Urgent consumer [illegible] |
| 24. Bothere Soap Industry | A | Private | 0.64 | Soap | Urgent consumer [illegible] |
| 25. Lake Katwe Salt Co. | A | Government | 0.50 | Salt | Urgent consumer [illegible] |
| RUBBER & PLASTICS | | | | | |
| 26. Dunlop (U.A.) Ltd. | A | Government | 2.63 | Bicycle Tires & Tubes | Key to transport [illegible] |
| 27. Tool [illegible] Ltd. | A | Private | 2.75 | Mattresses | Urgent consumer [illegible] |
| 28. Uganda Bata Shoe Co. | A | Private | 1.41 | Shoes | Urgent consumer [illegible] |
| 29. Uganda Leather & Tanning | A | Government | 1.11 | Leather | Input to Shoe Factory [illegible] |
| 30. Uganda Foam Industries | A | Private | 1.25 | Mattresses | Urgent consumer [illegible] |
| WOOD | | | | | |
| 31. Tooly Sawmillers | A | Private | 1.77 | Timber | Key construction material |
| 32. Jinja Saw Mills | A | Private | 1.1 | Timber | Key construction material |
| 33. Lugogo Wood Works | A | Private | 0.24 | Treated Timber | Key construction material |
| MINING | | | | | |
| 34. Unique Quarries | A | Private | .91 | Aggregates | Key construction material |
| 35. Nyanja Stone Quarry | A | Private | .91 | Aggregates | Key construction material |
| 36. Timuzitowe Enterprises | A | Private | .91 | Aggregates | Key construction material |
| IRON STEEL METALS & ENGINEERING | | | | | |
| 37. Steel Manufacturers of E.A. | A | Joint Venture | 31.1 | Steel | Key to construction & [illegible] |
| 38. UMA Engineering | A | Joint Venture | 13.1 | Foundry | Key to engineering [illegible] |
| 39. E.A. Steel Products Ltd. | A | Government | .1 | Pipes | Key construction material |
| 40. Tempero | A | Government | 1.33 | Tools | Urgent consumer needs |
| 41. Sembule Steel Mills | A | Private | 2.55 | Drawn Wire | Key Input to [illegible] |
| 42. Furuco Steel Works Ltd. | A | Government | 13.00 | Corrugated Iron Sheets | Key construction material |
| Total Cost | | | 372.46 | | |

NOTES: I. Many of the projects resulting large investment outlays for rehabilitation [illegible] rehabilitated according to phased reserves.

II. It is necessary to undertake detailed technical, economic and financial appraisal of each project before resources are [illegible] rehabilitation. Some projects which look like obvious priority may turn out after such appraisal to be unworthy of priority attention.

III. The cost estimates may have wide margins of error since they have not been thoroughly appraised

| | PRODUCT | MACHINERY COSTS | RAW MATERIAL | OWNERSHIP | | LOCATION |
|---|---|---|---|---|---|---|
| 1) Fishmeal | | US Dollar Million | % Local | % Foreign | | |
| Olympia Fishing Industry Ltd | Fishmeal | 3.0 | 100 | - | PVT | Kyigi |
| Crested Foods Ltd | " | " | " | - | " | Jinja |
| Food and Feeds | " | " | " | - | " | Kampala |
| 2) Cold Storage | | | | | | |
| Uganda Cold Storage Ltd | Fish | 0.5 | 100 | - | PVT | Kampala |
| Kedapakol Fishermen Co-op Society | " | " | " | - | " | Mbale |
| 3) Uganda Leather Tanning Industry Ltd | Tanned Leather | 2.0 | 100 | 100 | UDC | Jinja |
| 4) Tea Processing | | | | | | |
| Uganda Tea Growers Corporation | Tea | | 100 | - | GOVT | |
| Mehta Group (Uganda Tea Corporation) | " | | 100 | | Joint | Lugazi |
| Private Tea Estate (10) | " | | 100 | | - | |
| 5) Bipco Industries Ltd | Pulp | 10.0 | 80 | 20 | GOVT | Jinja |
| 6) Associated Match Company | Safety Matches | 3.0 | 70 | 30 | " | " |
| 7) Uganda Plant Pool Ltd | Tractor Hire | | - | - | Joint | Kampala |
| 8) E.A. Steel Corporation | Steel | 21.1 | 30 | 70 | " | Jinja |
| 9) UGMA Engineering Co Ltd | Hoes and Castings | 6.0 | 50 | 50 | " | Lugazi |
| 10) Uganda Hoes Ltd | Hoes | 2.0 | 50 | 50 | GOVT | Jinja |
| 11) Uganda Hessian Bags | Hessian Bags | | | 100 | " | Tororo |
| 12) Uganda Bags Ltd | Proplyene Bags | 2.0 | | 100 | PVT | |
| 13) Barbed Wire | | | | | | |
| M.A. Farm Industry | Barbed Wire | | | 100 | PVT | Kampala |
| Mbale Steel Wire | " | | | 100 | " | Mbale |
| Semuele Steel Mills | " | | | 100 | | |
| 14) Uganda Fishnet Manufacturers Ltd | Garnes | | | 100 | GOVT | Kampala |
| 15) Plysack Industries | Proplyrene Bags | 2.0 | | | | |
| 16) Fabrication/Workshops | | | | | | |
| Coffee Machinery | Coffee Machinery | 0.5 | 30 | 70 | PVT | |
| Maize Mill Machinery | Maize Mill Machinery | 0.5 | 30 | 70 | " | |
| 17) Sugar Processing | | | | | | |
| Kirinya Sugar Estates | White Sugar | 3.5 | 95 | 5 | PVT | Iganga |
| Afro-Trade & Industry | " | " | 95 | 5 | " | " |
| Kiwoni Ranchers | " | " | 95 | 5 | " | Kampala |
| Magigye Farm | " | " | 95 | 5 | " | " |
| Mabira Sugar Estates | " | " | 95 | 5 | " | " |

| | | Product | Machinery Costs | Raw Material | Ownership | | Location |
|---|---|---|---|---|---|---|---|
| | | | US Dollar Million | % Local | Foreign | | |
| 18) | Oil (Cont'd) | | | | | | |
| | Cooko Group | Edible Oil | 1.5 | 100 | - | PVT | Gulu |
| | Esso Oil | " | " | 100 | - | PVT | Jinja |
| | Mugambe Enterprises | " | " | " | - | " | Kampala |
| | General Millers & Chemicals | " | " | " | - | " | Gulu |
| | Olwol and Sons | " | " | " | - | " | " |
| | Bosi (U) Ltd | " | " | " | - | " | Kasese |
| 19) | Sifted Maize Meal | Sifted Maize Mill | | | | | |
| | Iganga Maize Industries Ltd | " | 0.3 | 100 | - | PVT | Iganga |
| | Amuria Milling Centre | " | " | " | - | " | Soroti |
| | Nagongera Maize Mill | " | " | " | " | " | Nagongera |
| | Unga Feeds Ltd | " | " | " | - | " | Kampala |
| | Luwedde Enterprises | " | " | " | - | " | Kampala |
| | Ivan Bwambale & Partners | " | " | " | - | " | Kasese |
| | Elgon Grain Mills Co Ltd | " | " | " | - | " | Kapchorwa |
| | Bazongera Enterprises Ltd | " | " | " | - | " | Masaka |
| 20) | SAW MILLS | | | | | | |
| | Jinja Constructional Joinery | Sawn Timber | 3.0 | 100 | - | PVT | Jinja |
| | Ama Ply | " | 4.0 | 100 | - | " | Budongo |
| | Lake Shore Sawmill Co Ltd | " | 3.0 | 100 | - | " | Masaka |
| | Tazekererwa Timber Mills | " | 2.0 | 100 | - | " | Soga |
| | Uganda Floor Tiles Ltd | Plywood & Pacquates | 1.0 | 50 | 50 | " | Kampala |
| | Budongo Saw Mills | Plywood & Veneer | 3.0 | 50 | 50 | " | Budongo |
| 21) | Magula Plantations | Cocoa | 0.5 | 50 | 50 | " | Mukono |
| 22) | ANIMAL FEEDS | | | | | | |
| | Good Harvest | Animal Feeds | 0.3 | 80 | 20 | PVT | Kampala |
| | Industrial & Agricultural Chemical Industry | " | 0.3 | 80 | 20 | " | Kampala |
| 23) | East African Steel Products | Steel Pipes | 5.0 | 20 | 80 | Govt | Jinja |
| 24) | Uganda Cement Industries | Cement | 13.0 | 95 | 5 | " | Kasese |
| 25) | Dunlop E.A Africa | Bycle Tyres | 2.0 | | 100 | " | Jinja |
| 26) | Rehabilitation of Ranches (40) | | 8.0 | | 100 | " | |
| 27) | Rehabilitation of Diary Farm (40) | | 8.0 | | 100 | " | |
| 28) | Wambizi Co-op Society | Processed Pork & Sausages | 0.33 | 100 | - | PVT | Kampala |
| 29) | Nakoko Co-op Society | Processed Chiken | 0.3 | 100 | - | " | Kampala |

## RELATION WITH WORLD BANK REHABILITATION GRANT

The World Bank Grant was discussed in Washington, albeit briefly. Final negotiation on the second tranche credit had not been completed at the time. While the second grant had been negotiated, we were advised that it will be about U.S.$/25-30 million and channeled through the UDB and possibly U.S.$/5 million additional to be channeld through the UCB. (See comments above on both Banks.) As noted, there will be an appendix which will cover the proposed lending activity of the foreign exchange by the UDB, and its impact as it might be of interest to AID.

## DISCUSSION WITH OTHER DONORS

No World Bank representative was not available in Kampala for discussion of ongoing and future World Bank Grants. However, a permanent World Bank representative will be in Kampala soon. All of our data outlined above and in the appendices attached with reference to World Bank activities has been second-hand.

We talked at length with the local head of the EEC projects. He gave us accurate information about the situation in which we were interested, e.g. steel for hoes. In answer to a direct question he said the only other agricultural project in which they had an interest was a scheme for improving the coffee industry, the details of which he did not specify, but which would

involve some U.S.$/45 million. This project has not yet been approved by EEC headquarters and he had no knowledge of when, or if, it would be approved.

Time did not permit further donor contacts, but the Mission is in touch with these people so that sufficient information is available to avoid working at cross-purposes.

# ADDENDUM TO THE CONSULTANT'S REPORT

In addition to the Scope of Work in our contract we have deliberately strayed into several other fields which we believe are important to development of the economy in the future or which would diminish a very principal problem of the current recovery--the supply of foreign exchange. To this end we attach appendices covering:

1. The iron and steel situation.
2. Kenaf as a substitute for imported jute.
3. Developing an indigenous supply of ingredients for a lead-acid battery facility.
4. A discussion with UDB analysts and appraisers about proposed lending activities of the UDB. This includes commentaries on other industries which were not examined in detail but which infringe on the AID agricultural thrust.

We have also included some recommendations and suggestions which may be within AID constraints and objectives, outside the possibility of execution by the present staff of the Uganda AID Mission. Nevertheless, we think that, in view of the interest of AID/W in Private Industry, which would be an additional burden on the Mission, some consideration of these suggestions, among others, should be given. In our opinion, the present staff is spread far too thin for the task at hand.

1. The Mission should obtain, on a direct-hire basis or assignment basis, an experienced Industrial Development Specialist who would be energetic enough to do the following, among other things, to assist the present staff:

a. Keep in constant touch with UDB and UCB to be familiar with their lending activities and the status of ongoing loans. Special emphasis should be given to matters in connection with UGMA and Uganda Hoes.

b. Confer frequently with Dr. Kinyata who is the head of the Industry Division of the Uganda Development Corporation. The Government-owned companies are under his jurisdiction and since he and they are political entities, it is easy to assume that loan or grant funds will be channeled in this direction and any great diversion from AID objectives should be promptly noted.

c. Confer with the Planning Commission, Industry Section, to be familiar with the direction of the Commission and to get advance information of industrial development.

d. Become acquainted with the officials of the Department of Industry to be aware of their activities and intentions which may develop into assistance activities which might assist AID objectives.

e. Keep in constant touch with the expatriate donor and lending agencies--the World Bank and IDA, EEC and international country groups.

f. Cooperate and confer frequently with the Mission Director and the Agricultural Advisor especially in the areas of their interests so that objcectives and agricultural activities can mesh with industrial activity.

2. The Mission should support by any possible means, those industries which, in time, could substitute indigenous materials for imported items.

a. Obtain the services of Erwin Sholton to up-date his study of kenaf for Uganda so that a project, revised to current conditions of energy, labor and investment climate can be presented to the Planning Commission, Ministry of Industry, UDB and others.

b. Encourage, perhaps with IESC assistance the setting up of a secondary battery lead smelter and lead oxide plant for Associated Battery Manufacturers.

c. Follow the activities of the Bearden and Potter Group in their study of the rehabilitation of TICAF.

d. In connection with c. the possibility of an iron sources may be developed. Exploitation of this source, if accepted by the GOU, should have U.S. competence offered on some assistance basis. (See supplementary report on Iron and Steel.)

e. Should the Kilembe tailings project be pursued by the GOU, the production of sulfur and sulfuric acid would help local industry immeasurably.

f. Support the work on fish meal, possibly with surplus American equipment which is available on the U.S. West Coast.

g. Be aware of the possible infrastructure projects in which the services of the U.S. T & D programs, which was referred to in a recent cable, could be used to the end that U.S. contractors could be employed by the GOU.

3. More logistic support of the Mission should be forthcoming. Uganda is indeed a hardship post and an effort to ease and improve living conditions, food supply, communications, etc. should be made.

4. We are grateful to the local AID staff and the support staff for assistance and hospitality which was, under less than ideal circumstances, above the norm to be expected by short-term visitor. Cooperation was never

withheld and, most of all, was given cheerfully and with good humor.

Philip W. Ruppert

# IRON AND STEEL SUPPLY

It is quite apparent that prompt attention should be given to developing an indigenous source for iron and steel. At this time most of the iron and steel products which are produced in-country are made from indigenous scrap. Some semi-finished steel products are imported, mostly as a feature of various commodity import programs to rehabilitate and support the iron and steel processing facilities presently extant. A significant portion of these semi-finished products originate in Kenya, which are also produced from scrap.

It is impossible to accurately gauge the availability of scrap within Uganda but a consensus of users suggests that scrap can supply present users for a period of two to five yers. It is probably inevitable that Kenya, which also uses scrap exclusively in its fabricating industries, will eventually realize that they will soon be faced with a non-renewable source of ferrous raw material and will then ban the export of scrap, at least and probably semi-finished ferrous products as well. In such a situation of scarcity of indigenous scrap and no nearby availability of scrap or semi-finished iron and steel, the ferrous fabricating industry in Uganda will be even more restricted than they are today and could come to a complete stoppage except for a minor amount of production based on a small scrap production (with inevitable higher prices for the scrap) derived from current sources.

The solution to the problem lies in generating usable iron from Ugandan natural resources. From what we have learned there is a vast quantity of reputedly 70% hematite ore in the Kabale area. This is a most desirable product from which to produce basic iron, both because of its high metallic

(70%) content (compared to 53% from U.S. Great Lakes sources and about 60-63% from Australian sources) and because it is low in sulfur and phosphorus which makes it easier to smelt and prepare the ore for processing. However, to exploit this deposit a railroad line of about 150 miles (a distance which is exaggerated) would be needed and while mining could be done by an openpit process, development of the deposit would require such a large investment that it is fruitless to discuss the matter for now. It should be noted that such ore has a large potential for export as countries in the Mediterrean Basin. India and even Japan are buyers of iron ore for smelting in their own facilities. Depending upon the price for the basic ore, transportation costs in particular and efficient shipping facilities, exploitation of this deposit could result in a significant earner of foreign currency. It is also fruitless to consider smelting this ore in-country at this time, notwithstanding a need for basic iron in Uganda and many other African countries. The cost of installing reduction facilities for an installation of a blast furnace of economic scale is so large, and the availability of carbon reducing agents and fuel and even fluxes is so discouraging that smelting would have to be considered only after a future mining-only enterprise has been studied.

This is not to say that a mining-smelting enterprise in this area is inconceivable and it is likely that iron and steel interests throughout the world would surely take a look at the area and the possibility of developing it. What is needed is a pre-feasibility study to estimate the volume of ore in sight and to outline any restraints which would exist. A possibility would be financing a Feasibility Study through the Trade and Development program

referred to in a State cable received in Kampala on April 13. Krupp (Fried. Krupp Gmbh, Krupp Industrie-undstahlbay, Duisberg, W. Germany) have made a proposal for a study of this deposit at Kashenyi Ridge, Uganda dated December 1979, together with Allgemine Finanz-und Waren-Treuhand AG, Vienna, Austria for the Madhvani Group of Companies. They indicate the ore as "60-65% fe and only insignificant traces of phosphorous, titanian and sulfur". No mention of phosphorous or any other elements which might be deleterious to the quality of the ore. Limestone for flux is available. THey indicate that charcoal would be the only source of fuel so they have calculated a mini-steel works of only 30,000 tons p/a. If there are, indeed, 30 million plus tons in sight, as we have been told, this is an enterprise for up to 1,000 years.

Krupp proposes to do a Feasibility Study to cover the complete geological and process description for such a plant for DM/404,000 (U.S.$/170,000) in addition to which all in-country expenses, support, living expenses, travel and core drilling rig are to be provided by the Agency which makes the contract. Besides our disagreement with the concept proposed, we think the price to be out of line for four months work for perhaps four men including one geologist.

We have found that the Uganda Development Company (an agency concerned with Government-owned enterprises) and Uganda Steel Corporation (Government-owned but with specific responsibility for iron and steel efforts) have done some work on this and the other iron source to be discussed below.

In December 1973, A. A. Jones of W. S. Atkins and Partner and F. H. Fitch of Mackay and Schnellman (both U.S.) made an inspection of the area but the results were either lost or not disclosed. In any case, no action was

taken.

In the meantime, also, samples of the ore were taken and analysis made. We saw the samples and the weight and apparent purity of the samples were almost unbelievable. The analysis we saw was 98.2% $FE_2O_3$, which translates to 70% FE. The impurities were very low and free of phosphate and $T_1O_2$.

A more practical approach to an iron source with a possibility of obtaining iron in a reasonable time frame might be to exploit a source of magnetite tailings from ore processing near Tororo. A small sponge iron facility could be set up and the sponge iron product either reduced to basic steel in a converter or simply melted in the 12-ton electric furnace depending upon the type of product needed.

Subsequently, we have learned that an IDA Technical Assistance Credit is financing a 31-month study--the first part to be a Feasibility Study and the second part a Process Design for The Industrial Chemical and Fertilizer Complex (TICAF) phosphate fertilizer plant. Further Krupp made a proposal to study these tailings for possible use in an electric reducing furnace plus a converter for East African Steel. No action has been taken nor has a cost of such study been indicated. The Krupp proposal would duplicate in large part the work which would be done at TICAF in separating the iron and phosphate from the ore. At present, the process considers the iron as a throwaway but if there was an outlet for a very low phosphorous magnetite ore, there could be a refinement of the process to get a cleaner separation between the phosphate and the iron. The technique, we are told is available in Finland and Brazil and was perfected only in the past three or four years. Krupp

disclaimed knowledge of such a technique and proposed perfecting beneficiation tests. A pelletizing plant would be needed since the tailings would be in slurry form but if pelletized and less than 1% phosphorous, pellets would be a prime feed for the electric reduction furnace probably at East African Steel.

Since the TICAF study would run so parallel to an iron study, prompt efforts to use the IDA Technical Assistance Credit for an iron study in conjunction with the phosphate work at TICAF should be made.

It is unlikely that AID has the capacity, to say nothing of the funds, to make such a study, but we will explore the matter with the Planning Board who appear to have control of the uses of the feasibility funds.

We have only seen gross samples of the magnetite tailings but the Uganda Steel Corporation showed us a sample analysis which is not within the parameters suggested by Krupp nor those described to us by others. The analysis is:

31.00 $Fe_2O_3$ (51.67 Fe)

1.4 MN

12.3 $AL_2O_3$

19.7 $S_1O_2$

11.0 $C_aO$

10.7 Phosphorous

2.5 $T_1O_2$

This is material which can be run through a flotation process which will remove the $Al_2O_3$, the $S_1C_2$, the $C_aO$ and, if modified, by the Finnish or Brazilian techniques, we presume that all but less than 1% of the

phosphorous would be removed. This would, of course, increase the $Fe_2O_3$ (and the iron) to closer to the 58-60% $Fe_2O_3$ referred to in the reports. However, the tailings would not be useful unless the phosphate was indeed less than 1%. Even then the presence of $T_1O_2$ would be a significant problem and a competent metallurgist would have to determine if the $T_1O_2$ can be eliminated by one means or another. We were told by the Bearden-Potter people that a niobium impurity is also present but we have no knowledge as to whether this is good or bad.

Copies of the Krupp proposals are attached.

The point of this discussion is that AID should follow this development closely and, if possible, assist in the study in some way. It is unlikely that an expatriate would be interested in this relatively small situation and it is doubtful if even a continuing supply from re-activating the TICAF Facility would be attractive. However, it is a vital development for the Uganda economy and AID should give it all the aid and confort possible. It is doubtful if East African Steel could finance the effort with all its possibilities, but we are sure they would welcome a loan (in foreign exchange/local currency) if it could be arranged. Besides the benefit to East African Steel, there are very many small steel users who are shut down (wire products, nails, beds, fencing) who are bereft of steel supplies and have no prospect of getting back, into business and continuing to exist without an assured supply of locally produced steel and iron.

Fried. Krupp GmbH
Krupp Industrie- und Stahlbau

# Proposal

for a

Prefeasibility Study

the Production of

High-quality Iron Ore Concentrates
from Sukulu Ores
for Utilisation in Jinja Steel Plant

for

Steel Corporation of East Africa Ltd.

22 July 1981

Fried. Krupp GmbH
Krupp Industrie- und Stahlbau

1. Objective

Steel Corporation of East Africa Ltd., owned by the Government of Uganda (51 %) and Madhvani Group of Companies (49 %) is confronted with the shortage of supply on scrap as input material for Jinja steel works. Long term continuous operation of the plant can only be assured by utilisation of indigenous raw materials, viz. the Sukulu (Tororo) iron ores, for replacement of scrap, being a scarce commodity in Uganda. Krupp Industrie- und Stahlbau (KIS) offer their services towards investigation of the possibilities for the production of concentrates with low phosphorous content from the Sukulu ores.

During the previous phosphate (fertilizer) production from Sukulu ores by Tororo Industrial Chemicals and Fertilizers Ltd. (TICAF) magnetite was produced as a by-product. The iron ore pre-concentrate obtained in the first stage of phosphate benefication was considered a waste product. Approx. half a million tons of magnetite containing a high proportion of impurities were dumped until production stopped.

These, as well as the much larger quantities to be produced during the envisaged future production should however be considered a valuable raw material source for Ugandan steel production.

A feasibility study on "Utilisation of Tororo Magnetite" prepared by Rheinstahl Export- und Industrieanlagen GmbH for Steel Corporation of East Africa Ltd. in 1968 alread

dealt with this subject. At this time, however, the project was to be based on the actual quantities of magnetite produced which were just sufficient for the envisaged enlargement of the steel plant's capacity (170 tpd of steel). Therefore no efforts were made towards the final upgrading into high iron-low phosphorous concentrates which resulted in proposals bearing the disadvantage of a complicated metallurgical process consisting of

- pelletisation of concentrates
- blast furnace on charcoal and fuel oil basis
- primary refining hearth
- electric arc furnace

An iron ore containing 58 - 60 % Fe and 1.3 % P as proposed by Rheinstahl, will be difficult to handle with respect to raw material preparation and metallurgy. Furthermore, despite metallurgically feasible, this process is nowhere in technical application.

Numerous benefication tests were run on behalf of Rheinstahl which provide a basic knowhow about the ore properties. These tests were not carried out to the ultimate consequence, thus leaving open the possibility of recovering high grade pellet concentrates with + 65 % Fe and < 0.1 % P. Such concentrates would ease the metallurgical process to

- pelletisation of concentrates
- electric reduction of pellets with charcoal as reductant
- steel making by oxygen top blowing converter with the possibility of using either pellets or scrap as cooling media

This commonly known process permits the substitution of scrap smelting in electric arc furnaces by electric reduction of iron ore pellets.

For continuous operation the existing arc furnace (12 t) in Jinja steel plant still provides the possibility of steelmaking from fresh or return scrap during periods of maintenance. Converters of a minimum size of 5 to 10 t can feasibly be operated. The alternatives continuous or billet casting will be dependent on the final plant design capacity.

The study offered herein should investigate the possibilities for the production of high iron - low phosphorous pellets from the Sukulu ores and the application of conventional steelmaking technologies under due consideration of locally available materials and utilities.

During the KIS visit 500 kg of raw ore from Sukulu mine were collected with a view to carry out tests for improvement of the benefication system, to be based however on the results obtained during previous investigations. Furthermore particular attention was paid to the layout and condition of the TICAF plant, to making maximum use of existing and still functioning equipment if not considered to be used otherwise in the future TICAF operation, for the upgrading of the iron ore.

Results of the tests within the study should lead to proposals on how to pursue the project from there on

a) in case testwork proves succesful, elaboration of a feasibility study for the scope of work outlined above

b) in case testwork proves unsuccesful, (low phosphorou concentrates cannot be obtained), updating of Rheinstahl report as to costs and advanced technology.

Scope of the proposed study is detailed blow.

## 2. Scope of Work

On the basis of 300 kg (2 drums) of raw ore collected during the visit of the KIS expert and at present stored at Jinja steelworks, KIS propose to investigate the following:

### 2.1 Scrubbing (Laboratory Scale)

- Size analyses of the material, as delivered, for the size range
  > 5, 5 - 1, 1 - 0.5, 0.5 - 0.1, 0.1 - 0.04, 0.04 - 0.02
  0.02 - 0.01, < 0.01 mm

- Assay of the head sample and size fractions for the following elements:
  Fe, $Fe^{2+}$, $P_2O_5$, $SiO_2$, $Al_2O_3$, $Nb_2O_5$

- Scrubbing tests for different scrubbing periods

- Size analyses as above after scrubbing

- Determination of optimum scrubbing period

2.2 Desliming (Laboratory Scale)

- Desliming tests at various sizes
- Chemical assays of the deslimed material
- Determination of optimum parameters for desliming takin into consideration recovery of iron and phosphate.

2.3 Magnetic Separation and Grinding (Laboratory Scale

- Davis Tube tests with different sizes after scrubbing and desliming
- Chemical assays of the various magnetic and non-magnetic DTT fractions
- Elaboration of data for different grinding stages necessary
- Determination of quality and quantity of utilizable magnetic concentrate.

2.4 Mineralogical Tests

Determination by microskopic and x-ray tests of

- mineral composition of raw ore, magnetic and non-magnetic products
- intergrowth of magnetic particles

2.5 Semi-technical Tests

- Semi-technical tests (scrubbing, desliming, grinding, magnetic separation) subsequent to laboratory scale tests for the production of low phosphorous pellet concentrates (< 0.1 % P)

- Chemical assays of the products

2.6 Beneficiation Flow Sheet

- Establishing of the process flow sheet

- Establishing of the machinery flow sheet

- Determination of utilities required

Beneficiation Plant

- Determination of utilizable portion of the TICAF plant for the production of pellet concentrates

- Estimation of machinery to be purchased

2.8 Pelletising Tests

- Pelletising test with concentrate obtained for the production of high grade pellets as input material for Jinja steel plant (electric reduction)

- Determination of binding additives

- Chemical assays of pellets produced

- Physical tests with pellets produced

- Determination of utilities required

.9 Reduction Tests

- Determination of reduction properties of pellets by electric reduction on the basis of charcoal
- Determination of utilities required

2.10 Process Description

- Benefication
- Transport
- Pelletising
- Electric reduction
- Converter

2.11 Cost Estimates

Estimate of global investment costs for

- Concentration plant under due consideration of available equipment at TICAF
- Material handling and transport to Jinja
- Pelletising plant
- Electric reduction furnace
- Converter plant

2.12 Feasibility Proposal

The above results will lead to proposals on the further pursuance of the projects, scope of work and cost estimate for required feasibility study.

2.13 Report

Report in English language on the findings as per paras 2.1 to 2.12.

3. Time Schedule

The estimated time for elaboration of the studies as per paras 2.1 to 2.13 will be 6 months from receiving of the sample material from Uganda.

4. Investigation Costs

The total investigation costs are highly dependent on the testwork required (paras 2.1 to 2.5, 2.8, 2.9), covering a major proportion of the proposed scope of the study. Owing to the works holidays of our laboratories ending 24 July, these costs can be inquired earliest next week and will be submitted thereafter.

UDB AND CONSIDERATION OF PROPOSALS

FOR USE OF SECOND TRANCHE OF WORLD BANK GRANT

(This should be read in conjunction with the UDB list of "Projects for Consideration")

On April 19 we visited the Uganda Development Bank and after meeting briefly with Mr. Kasujja, Head, Department of Industry (at which time he confirmed action going forward to extend IDA LCs scheduled for expiration at June 30--referred to in a cable to Nairobi on April 20), we met about ten of the loan evaluators and loan appraisers of the Bank staff, but without Mr. Kasujja.

The group was very cordial but while their general knowledge of the physical aspects of the project was considerable, their analysis of both the economic utility of the individual projects and their place in the progress of the Ugandan recovery scheme was in many cases weak. We explained in detail that the AID program was to be spread over a number of projects including education and research and CIP and that any assistance to industry would have to be confined to those industries which impinged on agriculture.

When that was understood (and accepted with less than universe enthusiasm) we proceeded to discuss in detail some of the projects on the attached list of 29 types of projects. Those we did not discuss were turned aside as not within the area outlined above or simply did not have a significant inpact on the local agricultural economy. "There are no calories in tea" as a defense against the rather massive input for tea companies required--(but not detailed on the Consideration List).

We started with Item 1.--Fish meal. There are several other entities under consideration in addition to those noted and all will be appraised and analyzed shortly. The eventual plan is to have two installations on Lake Victoria and one on Lake Kyoga. The cost of each installation is estimated (inaccurately, we believe) at U.S.$3 million. Each installation was to have a fish meal plant with an imput of 25 tons per day to produce 5 tons of fish meal. Cost of such a plant was to be U.S.$.5 million, which is probably somewhat high. We neglected to discuss fuel input for the plant and we have never heard of an electrically heated fish meal plant, but in our opinion, the problem is not imminent. For example, when we asked what they planned for the oil produced we drew a blank and only when it was explained that oil production was inevitable in a fish meal plant and excessive oil in the meal reduced the utility of the meal in poultry and cattle feed, did they indicate that sale to oil refineries/soap factories would be a solution, although not presently foreseen and planned.

The principal problem revolved around the question of whether the balance of U.S.$2.5, or less after bare facilities were defined, might be insufficient to obtain the two trawlers contemplated for each installation. The problem of getting a trawler of size to Uganda from the sea was "overlooked". In our opinion, even the absence of a closer inspection of current fishing operations, UDB has little more than theoretical operation of trawlers. They said that fishing operations would take place at 60 meters depth but when we asked if Lake Victoria was not too shallow for such operations, there were blank looks and no response. It is likely that the Norwegian assistance they have had has influenced their ideas of not only how

to fish but also equipment, cost, etc. We would defer to superior fishing knowledge of the Norwegians but we believe the cost of two trawlers with 25 ton/day capacity would exceed the less than U.S.$2.5 million allocated for this purpose. There was no knowledge of the size of the trawlers, crew size or equipment and operation.

Further, we discussed the fact that the inevitable 25 ton per day catch would include fish of a quality too good to be converted entirely to fish meal even though after filleting or gutting operations some input to the meal operation would result. We asked if input of rough fish, or scrap after filleting from the local small fishing industry would be available to the meal plant and there was no reply to this obvious question. From all of this it appears that local inexperience with trawling operations and fish meal production is entirely absent and there are holes in their judgment and appraisal.

It appears that considerable technological assistance and planning is required and it should be available from sources other than AID and AID should not involve itself in this particular project.

Item 2--Cold Storage. We considered this project academic as the fresh fish market is alive and well and anything which would not be sold fresh would have a ready outlet in the fish meal facility. There did not appear to be a real enthusiasm for this project so it was quietly dropped before it was necessary to voice a definite disapproval.

Item 3--Tanning was discussed very briefly but generally agreed that until the Ugandan cattle/dairy industry revived there would be little need for consideration of increasing tanning production.

Item 4--TEA processing was dropped out of the discussion despite quite obvious enthusiasm of the group for active attention. Some rehabilitation of the tea factories seems to be required but most of the requirement is for local currency for agricultural rehabilitation. We believe that if machinery is required, supply and technical information could be better obtained from a source more familiar with tea culture than AID. As for the local currency needed, if it is not available from internal generation it seems more sensible to reserve foreign exchange for other more urgent Ugandan foreign exchange requirements than to convert it to local currency for this project.

Item 5--Paper Pulp was dropped after we explained that they had inadequate funds planned for obtaining equipment to set up a plant of economic scale. This led to a discussion of local furnish for the mill instead of recurring need for imported pulp. It was agreed that the decreasing local forests would be an undependable permanent source for pulp, even if they had pulping capacity, which apparently they did not. Inevitably, this led to kenaf fiber, as opposed to whole-stalk kenaf used in the Thai paper mill, which would make a good paper if they had pulping capacity. Bagasse was also discussed but when we explained the necessity for depithing, storage and the rather indifferent paper to be produced, in addition to pulping equipment, it was accepted, for the time being at least, that paper was not to be compared as a priority before many other more urgent prospects and, in any case, AID was not prepared to assist in this area. So they will continue to import pulp until a clearer picture of the pulp/paper industry is in sight.

Item 6--Safety Matches was quickly passed over to our relief, but we

got the impression that more matches was not an urgent problem and somewhat lower in priority.

Item 7--Tractor Hire brought on a most vigorous discussion after we indicated that we did not consider this an industrial development directly impinging on agriculture and we would not be inclined to support the purchase of tractors. In defending our position, it was inevitable that the "track record" of the previous tractor scheme appeared to be counter productive. After explaining the term "track record" we were assured that this scheme was "all different" but the explanation seemed to be the same performance plan in different words. Curiously, this scheme was one of the most vociferously defended by the group and at this time we are puzzled as to why the group was docile about some of the other projects we rejected and so supportive of this scheme. It does not seem to us to have all that priority except that it would probably benefit the larger land owners and farmers more than the small land owners and farmers. So it is possible that there is a tilt in the attitude of the UDB toward large borrowers as opposed to those enterprises assigned to the Uganda Commercial Bank which were less than the bottom limit of U.S.$.3 million of the UDB.

Items 8, 9, 10--Steel, Hoes and Castings were discussed as a group. Somewhat to our surprise they volunteered that the "wish list" of the steel companies was unrealistic in that they wanted (1) a lot of money which was not in sight and, (2) they wanted everything to rehabilitate everything without indicating priorities. The group suggested that the "wish list" was too unwieldly for both of these reasons and they were of the opinion that the request should be "upgraded". They explained that "upgrading" meant

examining each item requested and, if necessary, revising the price but at the same time assigning priorities by items with whole amount spread over a larger period than immediately. However, they want AID to to continue and possibly increase the commodity import program and, if possible, assist in the rehabilitation aspect at the same time. In response to our question, they are committed to continued rather than sporadic support of the rehabilitation program with funds from others than AID, specifically the World Bank Rehabilitation Grant.

To our considerable surprise also, they seemed to be aware of the precarious scrap and raw material supply problem but had done no apparent homework on it. We sketched lightly what might be done about developing Tororo ore and sponge-iron but we might have been talking another language as far as their full understanding of the solution to the problem was concerned.

We think the Bank group is a bit bewildered at the magnitude of the basic iron supply requirements and they do not as a whole understand all of the ramifications and possibilities presented in the steel mill rehabilitation program. They agreed that hoes were a priority item and, as will be developed below, a few other commodities would develop as the steel plants come up to a greater production.

Since we have treated the basic iron supply in another section of this report, we thought it fruitless to burden the group with another detailed set of problems since East African Steel is familiar with the situation and the matter will be discussed with them in detail later and the results of that discussion will be added to the situation paper. Thereafter, the steel companies will have to approach the UDB for the inevitable development and

financing of an iron supply project.

We had the possibly unfair feeling that the group is a bit jealous of the technical competence of the steel companies as a whole. However, they do appreciate the importance of iron and steel in the Ugandan economy and it is likely that they will give these things assistance as funds permit even though the priorities are not at hand at this time.

The steel companies have a long road ahead of them to educate and cajole the UDB group so that the steel rehabilitation program goes forward. The group is grateful for AID commodity assistance and were most fervent in their request for additional commodities.

Since AID has a relatively narrow interest in the steel companies, it would seem that outside technical advice and counsel to the UDB might be very useful. Either a full-time AID employee who could concentrate on coordinating and, if there is such a word, prioritizing the steel company requests in assistance to the UDB Industry Group or an IESC-type who could devote full-time for a few months to getting the program prepared in an orderly manner, is urgently needed. This could be coordinated with whatever money which might be allocated to this effort by the Bank.

Item 11--Bags and Hessian revived a discussion of kenaf and the fruitless continued dependence on imported fiber. The group indicated that very little or no equipment was needed to get the mill up to a greater capacity (which a visit to the mill confirmed) and had considerable interest in the possibility that, with an indigenous source of fiber, there were export possibilities. There was no positive statement that bag manufacture from natural fiber in the East African area was entirely dependent upon imported

fiber but the feeling was that this was so. Although Items 12 and 15--Polypropylene Bags, were an obvious corrollary to the bag problem and they were inclined to support polypropylene bag manufacture, it did not take a major effort for them to understand the effect on the synthetic fiber bag manufacturing industry if indigenous natural fiber could be used. In a word, they bought the kenaf suggeation, we think, even though they recognized that kenaf fiber could not appear overnight. Whether they will use caution in allocating funds to support a polypropylene bag manufacturing effort is a matter over which we could have no influence.

We would urge that Sholton should be engaged by AID on a short-term basis to re-survey the area and to decide whether the Kenaf Feasibility Study should be updated. If the decision is in the affirmative, he should be engaged at once. We know kenaf fiber is produced in Thailand and is sold for use in making bags in India, Pakistan and Bangladesh and some was even sent to the U.S. where no problem was encountered in using it for bags and Hessian cloth.

We are only guessing, but we guess that 6000 to 8000 acres (Sholton indicated 6700 acres) would be needed for a kenaf crop in the Tororo area to supply local requirements. The UDB group said there was easily this much land available in the area. A separate discussion of this subject is reported elsewhere after we received additional information on the prospect.

Items 12 and 15 were referred to above, but there was little further discussion of polypropylene and it is quite evident that there were some doubts about the sensibility of these projects particulary as U.S.$2 million of foreign currency for each installation is involved. We said that nothing

should be done until we get a clear picture of the utility of kenaf in Uganda.

Item 13--Barbed Wire, is dependent upon galvanized imported wire. Notwithstanding the need for barbed wire in the agricultural sector, it would seem that the flow of wire from the East African Steel Company through others with galvanizing abilities would influence whether barbed wire was to be produced locally. It is possible that UDB will allocate foreign exchange to buy imported wire for locally manufactured barbed wire for a time until local supplies can be generated.

Item 14--Fishnets. The fishnet business was reported elsewhere but AID should be interested in this business. All of the requirement is foreign exchange for the purchase of synthetic nylon filament and it is pretty hard to find an indigenous substance which would replace synthetic filament for nets. Apparently little additional imported machinery is involved.

Item 16--Fabrication/Workshops. Assistance was proposed for coffee and maize mill machinery but were not pushed very hard by the group. We will try to see them if time permits. If it is simply fabrication of machinery, perhaps UGMA could do the manufacturing of parts.

Item 17--Sugar Processing. Sugar processing is, of course, a large business but for the U.S.$17.5 million indicated for the five mills to, we understand, primarily convert local crude sugar to white sugar, we think that such refineries are of less priority and usefulness than many other of the needs for foreign exchange. Sugar as produced internally now, without refining to white sugar, appears to be satisfactory. However, some rehabilitation of machinery other than refining equipment is undoubtedly necessary.

Item 18--Oil Mills. It seems to us this subject should wait until a direction is determined as to which oil seeds will be produced under current agricultural programs. Apparently, some of the present oil mills still use hydraulic presses which are wasteful and uneconomic. The group displayed a surprising ignorance of the different manufacturing techniques but they appeared to want to help all the oil mills. Aside from our remarks about the uneconomic hydraulic press mills we told them that expellers plus solvent extraction was the preferred manufacturing technique even though present expellers leave more than 5% of oil in the cake. This is not only uneconomic, since oil sells for a higher price than cake, but cattle and poultry cannot tolerate even 5% of oil except in smaller than optimum quantities. Since so much will depend upon the agronomic future, and notwithstanding that expeller type oil mills can handle almost any oil seed, it might be prudent to determine the quantities of oil seeds in sight, in addition to the type before making a major effort to rehabilitate the mills (U.S.$9 million for six mills).

Item 19--Maize Mills. These were enthusiastically supported by the group even though all the mills were new enterprises. Further, they are all the same size and at the very bottom of the size of investment handled by UDB. Since we were ignorant of just what they did except that they ground maize to an acceptable flour, we said we could look at one or two as time permits and comment further at a later time. Later we learned that the UCB had financed with local currency, a number of small maize mills. It would appear that these mills are a somewhat larger version of such mills but noted that local currency is the financing needed so the project did not interest us unduly.

We took the occasion to suggest that someone in the group should look into the matter of aflatoxin and one participant at least knew what it was. We explained that the only remedy was drying the maize to less than 12% moisture and that any maize processing should be looked at to see that adequate drying was a part of the entire process. In a later trip we saw some old corn at a feed mill which had been cleaned out of elevators, etc. which was so obviously discolored by mold that we would expect that it inevitably contained aflatoxin.

Item 20--Saw Mills. These were not discussed at length since we noted that there is a problem of deforestation in Uganda. A massive investment (U.S.$25 million) in six enterprises might end up a disaster if forests were further depleted. In any case AID, as a matter of local policy, should not consider assistance.

Item 21--Cocoa. The cocoa plantation is apparently a new enterprise. The only comment we could make is that cocoa culture is a very meticulous process requiring careful and frequent spraying of fungicides. We indicated that AID could not be interested in an enterprise about which we know so little.

Item 22--Animal Feeds. This should be the foundation for a poultry and/or cattle feeding process. However, fish meal production is in the future and the oil seed program has only cake which has limited use (because of high oil content) in feeds. AID could help such enterprises since, if feed were available, small operations could raise poultry and even a few cattle without the necessity for a large, expensive installation. We will get a look at these businesses and report later.

Item 23--Steel (Cast iron?) Pipes. This is a project for centrifugally cast, cast-iron pipes for which there is a significant demand in Uganda. Whether this is agricultural or not is a question so it may not fall within the AID program. We saw the installation at Jinja, which was not operating, and it may just be idle because East African Steel does not have cast iron nor present facilities for making it or importing pig iron.

Item 24--Cement: Uganda Cement Industries. The Tororo cement plant was seen within the week but the question again arises as to whether assistance to a cement factory would fall within the purview of assistance to agriculture. We have asked several people why they thought the cement was so poor that it had to be mixed 1:1 with imported cement or cement from the Hima plant. All said that it cracked and spalled. We read somewhere that it lacked calcium sulfate. There is a discussion of the problems of this cement factory elsewhere but the problems at this plant arise chiefly from excess phosphate. The other cement plant, Hima, was too remote to visit but we understand that it needs additions to its present capacity as does the Tororo plant which is operating at less than 25% of capacity.

Item 25--Bicycle Tires. These are a necessity in the agricultural community. The group indicated that the crying need was for imported raw material but also some minor refurbishing of machinery plus an effort to have the previous management return. Comment on this elsewhere.

Items 26 and 27--Rehabilitation or Ranches and Dairy Farms. These were definitely agriculture but no exact list or exact investment in each enterprise was available. It is hardly expected that AID would assist large enterprises like this within the current program.

Items 28 and 29--Processing Coops. These facilities while relatively small, would be impossible until pork and chicken become available in larger quantities than available at present. And feed is not only expensive because of the significant requirement for imported ingredients (even salt!) but the poultry industry as such does not even exist.

## SUMMARY

While a number of enterprises have been put on the list of investment for the UDB for possible AID assistance, it is by no means assured that sufficient foreign exchange will become available to finance all of them--even on an extended time basis. Further many of these enterprises do not conform to the terms of reference of the present AID program. Nevertheless, we will see as many as we can in the time remaining and we will discuss them further after more details are known.

One further note: the attached list does not necessarily coordinate, either in names or amount with (1) Uganda Investment Program 1982-1985--Priority Industrial Projects--for a total of U.S.$372 million or (2) the short list of 25 medium and large scale projects for rehabilitation to be financed by the Uganda Industrial Rehabilitation Credit--total U.S.$152 million or (3) Summary sheet of small scale industries--Uganda Industrial Rehabilitation Credit--future proposals are summarized as follows:

| | U.S.$ million |
|---|---|
| Machinery and Equipment | 38.65 |
| 6 months imported raw materials and | |

| | |
|---|---|
| spare parts | 13.22 |
| Total Foreign Exchange | 51.87 |

A discussion of the UCB is presented elsewhere. The fact is that the above discussed projects are only a part of the projects which the UDB will consider. Some of them are not even on the gross list of projects 1982-1985 which amounts to U.S.$372 of foreign currenty. It seems to us that the UDB is as guilty as its clients in preparing unrealistic "wish lists". It would be helpful to all concerned with assistance to Uganda to have a coherent and complete picture of realistic projects and their need expressed in both local and foreign currency for both the UDB and the UCB. However, we do not think that the lending staff and its supporters is equipped to make such a coherent report and reinforces our belief that the analyst and appraisal staffs are quite inadequate as channels through which to funnel U.S. assistance, unless AID participates in the decision and monitoring process.

## OIL MILLS - SOAP PLANTS

With reference to oil mills, we have noted elsewhere that the plants we have seen are old and so worn as to be inefficient. This purview is of plants with expellers of various makes. If any of the plants are using hydraulic presses, they should be junked immediately as they would be much less efficient than even the worst expeller mills.

All of the mills need maintenance attention and repair parts to operate anywhere near capacity. But they are operating at low fractions of capacity, like 25%, because they do not have enough oil seed feed--or least a consistent supply.

The mills we saw were crushing 1979 cotton seed with poor results in that they not only produced oil cake with 5-7% of oil content but, probably because of the age of the seed, the free fatty acids were so high that production of at least 20%, and higher, of soap stock reduced the edible oil content unreasonably. Thus, the whole crushing operation did not give optimum results. Too much oil was remaining in the cake leaving the plant and the oil content of the cake was too high for it to be fed freely to poultry or cattle.

However, as stated elsewhere, improvement of the mills could be delayed for more urgent needs for foreign exchange since there are not enough oil seeds to tax the limited capacity of the mills.

To this end, a large program of getting small-holders to grow soy beans is being discussed at the Mission. The activation of such a program is beyond our imagination of how it is to be done but the agricultural people could point the project in the right direction. Four thousand acres at Emco

Oil Refineries (Madhvani sugar land) is being planned for a two-year exercise to provide seed for this oil mill. Thereafter, the land will revert to sugar cane. We are told there is plenty of seed available and notwithstanding the necessity of harvesting by hand (and probably planting by hand) the planters hope, by this example, to encourage small-holders to plant soy beans for the mill.

We think that any small-holder program should provide seed and some sort of a guaranteed cash market. Just how this should be done and whether the marketing should be via cooperatives or sale direct to the mill is a problem for the project planners.

Up to a point, and with some ingenuity, the oil mills can handle what might be produced for several years. Since the mills can crush any seed--cotton, soy, sunflower, sesame and even palm oil--there are no manufacturing restrictions as to what oil seed can be grown and since the demand for oil is high locally, and for export, the opportunity for growing almost any oil seed is extensive. The effort should be supported by AID and even backed by contributions of good seed and possible commodity market support.

The corollary soap factories have little or no tallow sources and will have to depend upon soap stock from the edible oil refineries for the most part. Since the oil mills are operating at much less than capacity and normally soap stock should be less 5% of the refinery input, increasing oil seed production is of the utmost necessity if a soap industry is to be viable. Soap in Uganda is one of the very scarce commodities in Uganda and production of soap is a national necessity.

## FEED MILLS

We visited Vita Feed Mill (Uganda Feeds, Ltd) at Jinja. Their largest product is poultry feed but they also make and sell a relatively small amount for cattle feed. They are operating at about 10% capacity but sales are slow because the farmers cannot afford to buy feed at the prices established at the mill. The prices are high because the imported ingredients and additives are high. Also foreign exchange to import these items is not freely available.

Their capacity is about 60000 tons p/a and they want to increase their production to about 25% of capacity. The requirements for the tonnage is as follows:

| Social Ingredients | MT |
|---|---|
| Maize | 7000 |
| Pollard (from sister flour mill) | 650 |
| Wheat Bran | 1000 |
| Maize Bran | 2000 |
| Molasses | 500 |
| Cotton Seed Cake | 880 |
| Common Salt | 50 |
| | 12080 |

| Imported Ingredients | MT |
|---|---|
| Soy bean meal | 1125 |

| | | | |
|---|---|---|---|
| Fish meal | | 700 | |
| Dicalcium phosphate | | 275 | Value 107,250,000 USh |
| Sunflower cake | | 500 | 1,260,000 U.S.$ |
| Feed grade Limestone | | 100 | |
| Vita-Mineral mix | | 50 | |
| | Sub total | 2750 | |
| | TOTAL | 14830 | |

Mr. Cook in Kampala has the prices for all grades of finished feed made at this mill. They are in the range of U.S.$.17-U.S.$.20 per pound, which is very high. Sale of the above amount of feed would require about 350,000 bags or about 1,400,000 bags at full production, which would be a most significant portion of the output of 5 million bags a year of the Tororo Bag Mill. Presently, because of the shortage of bags, a buyer must furnish an empty bag for each full one purchased. Such a system would probably be continued in normal times so new bags would only be required to replace used bags which are beyond repair.

Uganda Bags and Hess Mill Ltd-Tororo

This is a large bag and hessian cloth mill set up about 1969 by the Birla (Indian) family to operate on imported jute. The capacity of the plant is about 6000/MT per year which would turn out about 5400/MT of bags and Hessian cloth p/a - or something in the range of 5 million bags a year plus a quantity of hessian cloth to be used on baled cotton. The bags are very good, well-woven and can easily hold 50/kg or more of grain, cotton, sugar or whatever. The jute used is from Bangladesh and is of different quality. The bags are sold for the equivalent of U.S.$1.80 to the Cooperative which resells them at the equivalent of U.S.$2.40. This seems to us to be a relatively high price but the delivered cost of the jute is probably the principal factor in any unusual cost. Notwithstanding that the jute they use is not of the best quality, the freight cost is constant and for a sea plus rail transport of a bulky commodity, the delivered cost of the jute is higher than that at mills in India, etc., which produce the same product. At the same time a mark-up of 33% of cost by the Coop seems excessive if there are no unusual delivery problems. The plant is well-managed by experienced personnel who seem to know their business. All Indian management personnel have remained at the mill since its inception, an unusual situation, and the mill operated at greater or lesser fractions of capacity until 1981. They were shut down for all of 1981 until a supply of jute was obtained in early 1982 when they were given an allocation of foreign exchange. Some spares and repair parts are needed and there is only a small requirement for foreign exchange in addition to jute for special lubricants and fiber softeners.

We talked to the management about kenaf at some length. They are familiar with it, have used some--about 400 tons produced in-country until 1975--some from Thailand and would welcome a locally-produced kenaf fiber, not alone from the cost standpoint but from the point of view of a constant dependable supply which could keep the mill operating at capacity. They pointed out that at capacity they could supply all the needs for Uganda industry--even though used bags are a significant part of in-country supply--and might even have a surplus for export. In fact they indicated a reduction in bag price if cheaper fiber were available.

The fact that they had used kenaf produced at a prison farm in Uganda puzzled us until we obtained, by a singular logistic action, from Washington, a copy of a large Feasibility Study of Kenaf for Uganda prepared in 1970 by none other than Erwin Sholton of Agri-Consultants who we consider to be the foremost expert on kenaf in the world. This was like a gold mine of information since it was prepared in 1970, probably the last year of "normal" economic activity in Uganda before the troubles.

The study proposes a 6700 acre, highly mechanized, one-crop plantation in an area near Namulu prison, about 93 miles north of the mill in Tororo. This area was selected and approved by the Department of Agriculture as suitable for kenaf as it was physically separated from a large area devoted to cotton. The separation was necessary because kenaf and cotton share the same pests and they wanted to separate the crops lest the pests in one crop reinforce the pests in the other.

The 6700 acres was determined because that area, at an expected production of 3/4 tons per acre, would produce 5000 tons--very close to the

annual needs of the mill. Sholton proposed an initial 600 acre experimental plot--and this apparently was activated--hence the in-country supply of kenaf referred to above. He proposed a programmed increase in area to be cultivated to be spread over three or four years to the estimated 6700 acres. The total land available in the area is something in the range of 14000 or 15000 acres which could be used to expand the crop if the mill size was increased or an opportunity for fiber export presented itself.

We learned that the 600 acre experiment was funded to the extent of about 20 tractors and a large (and expensive) excavating machine, apparently somewhat on the order of an over-size backhoe. This latter machine was used for digging ditches and presumably to dig retting ponds. According to our informant, the IHC agent in Kampala, the tractors are in good shape, needing only minor repairs, and even the excavator is still available. All of this equipment seems to be under the control of the Bureau of Prisons.

The necessity to update the Feasibility Study arises for a number of reasons:

a. The study proposes a high degree of mechanization. Not only for preparing the fields, but to clear some of the planned area which, while not wooded, still require a considerable effort to make the land available for cultivation. Mechanization to a significant degree at this time may be impossible and alternatives may be necessary.

b. In addition to a probable lack of foreign exchange to buy the mechanized equipment, maintenance and fuel may be difficult.

c. Whether the area is still available for cultivation can be a question. THe prison is still there, of course, but we have heard a story

that the prisoners were to be transferred to another location and the present prison abandoned. The area is supposed to be an area to re-settle refugees from neighboring African countries. An area of 200 acres is indicated as reserved for some activity which might be related to such a settlement but whether it is or not will have to be learned.

d. Whether the Bureau of Prisons will be involved in this operation must be determined. Also whether prisoners would be a part of the work force--as they apparently were on the 600 acre experimental plot. Since the Bureau of Prisons has custody of whatever mechanical equipment survives, it is probably important to confirm the extent of the Bureau's involvement with any revival of the project.

e. Sholton originally proposed that 20% of the acreage should be produced by small-holders, after the 6700 acre plantation was in operation. It was not exactly clear how this was to be accomplished except to point out that land clearing and soil preparation to the degree of fineness of tilth necessary should be done mechanically. The examination of the appropriate use of mechanical equipment should take this factor into consideration. Such a plan works in Northeast Thailand so it could work in Uganda also.

f. The area has been described as a hotbed of insurgency and the security problem acute. Whether this is true or whether it is another in a long list of horror stories we have been exposed to in Uganda should be determined.

g. We have also been told that the local inhabitants in the area of Karamoja are not the most enterprising people in Uganda and are more inclined to the "pastoral" life. If this is true it would have a profound effect on

the decision of whether less mechanization would be possible with consequent labor demand.

A not inconsiderable factor in the Sholton study was the fact that he claims that with kenaf instead of jute the weight of the bag can be reduced by one-third. If this is true, it would not affect the number of bags to be produced from kenaf instead of jute since the machines would be spinning and weaving at capacity with either fiber. But any excess could find, we are sure, a ready market in Kenya. Also, if the small-holder program was instituted the production of 3/4 tons of kenaf fiber per acre would be a cash crop of significant proportions.

ASSOCIATED BATTERY MANUFACTURES

They are set up to make lead-acid automobile batteries and have all assembly equipment, charging and forming equipment and excellent space. The plant has been shut down since 1978 except for limited break-up of used batteries from which they remove the oxide, melt the clean grids and produce lugs. They buy (occasionally) formed plates from U.K. (and Kenya) for very, very limited production. Charging equipment (rectifier) is only now being hooked up but it is an impressive piece of machinery. Associated battery wants U.S.$/1 million in foreign exchange to buy lead and oxides to start making batteries (see attached) paper separators (fiberglass/paper for truck batteries) from Kenya, battery boxes from Kenya, and Europe and Japan. They can injection mold battery tops in an associated plastic plant. They have facilities for mixing oxide but no molds for plates although melting equipment and stands for molds are in place. Torches and melting equipment for assembling cells are on hand. The Executive Manager, Mr. J. Mulwana, is a very intelligent and knowledgeable man in a business apparently owned 40% in local equity, 60% in-country (Brits in Kenya?).

Recommendation: It is possible that the company is used as a captive outlet by the 60% ownership, for expatriate profit. If this possible problem can be avoided, we suggest that a small smelter (blast furnace type)--3 tons/shift to start, be obtained plus an oxide producer of similar capacity. There is apparently a plentiful supply of old batteries available so they can produce lead (about 3% Sb) and softening can be done to supply oxide manufacture. Molds for plates are needed. Also equipment for making boxes

(although salvage of old cases is not impossible) with possible gravity casting of boxes or alternatively purchase from Kenya or further abroad. The machines in the associated Ship Toothburch facility are too small to make boxes. Separators can continue to be bought from Kenya--it may be fruitless to set up the manufacture of separators by slicing from plentiful cedar wood.

Market is very large as Associated is the only lead/acid battery manufacturer in Uganda. Our estimated cost of equipment needed is $75,000-100,000--but we will check in U.S. for availability on a personal basis. The impact on the agricultural sector is significant as transport by any internal combustion engine is impossible without batteries--which deteriorate at a predictable rate.

Activation of such a scrap battery recovery facility would, if successful, save about U.S. 1 million of foreign exchange p/a and would probably result in a lower price of batteries to the consumer as Mr. Mulwana has indicated that his margin of profit would remain constant and any reduction in cost would be reflected in the gross sales price. It would also, as it were, expicit a natural resource (the ageing batteries in every car and truck in Uganda) since Associated would demand the return of an old battery for each new one sold. The merchandising aspects could be worked out so that the present 18-month warranty could be extended for the ultimate benefit of the consumer.

A list of batteries being made and to be made with their prices is attached. Imported batteries (by permit and availability of foreign exchange) are about 50% higher in price and the black market price for batteries, if available, is 100% higher.

While we will check equipment and prices for machinery in the U.S., the reclamation project and oxide manufacture is not as simple as just pressing a button. There is a possibility of in-country construction of the blast furnace at UGMA (and possible operation there). While Mulwana is a capable and intelligent man, he will need some technical help to get started. We suggested assistance from the IESC and explained the costs involved of travel and in-country support but no salary. We also explained the zeal with which most of these people approached a job and their high level of expertise. We did not explore his ability to finance the IESC person but it might be a good idea for AID to fund such an exercise as an instance of palpable aid to Private Industry development with agricultural implications also.

ASSOCIATE BATTERY MANUFACTURERS (UGANDA) LIMITED

PRICE LIST AS OF 15TH MARCH 1982

| Battery Type | Cost Price | 20% Sales Tax | Ex-Factory Price |
|---|---|---|---|
| 12/7 STD | 6,030 | 1,200. | 7,236 |
| 12/9 STD | 6,900 | 1,380 | 8,820 |
| 12 Short 9 STD | 6,900 | 1,380 | 8,820 |
| 12/11 STD | 7,540 | 1,508 | 9,048 |
| 12/13 STD | 8,710 | 1,742 | 10,452 |
| 12/17 STD ISUZU | 15,940 | 31,188 | 19, 128 |
| 12/21 STD | 17,140 | 3,428 | 20,568 |
| 12/31 STD | 20,300 | 4,060 | 24,360 |
| 12/29 LOW | 19,030 | 3,806 | 22,836 |
| 12/13 Tractor | 9,090 | 1,818 | 10,908 |
| 12/15 Tractor | 9,560 | 1,912 | 11,472 |
| 12/7 Narrow | 5,660 | 1,132 | 6,792 |
| 12/9 Narrow | 6,330 | 1.266 | 7,596 |
| 12 Tall 9 Narrow | 6,330 | 1,266 | 7,596 |

| | | | |
|---|---|---|---|
| 12/11 Narrow | 6,500 | 1,300 | 7,800 |
| 12/7 NS | 5,680 | 1,136 | 6,818 |
| 12/9 LOW | 6,700 | 1,340 | 8,040 |
| 12/9 VW | 6,700 | 1,340 | 8,040 |
| 6/13 STD | 5,650 | 1,130 | 6,780 |
| 6/17 STD | 6,700 | 1,340 | 8,040 |
| 6/19 STD | 7,150 | 1,430 | 8,580 |
| 6/27 | 9,560 | 1,912 | 11,472 |
| 6/13 LOW | 5 030 | 1,006 | 6,036 |
| 6/15 LOW | 5,830 | 1,166 | 6,996 |
| 6/17 LOW | 7,020 | 1,404 | 8,424 |

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| | |
|---|---|
| Charging with Acid | 1,000 |
| Distilled Water (20 ltrs) | 500 |

# PANGAS (MACHETES)

On April 19th we visited Mr. Sugakela at Magigye Farm. They produce pangs from stamped blanks of mild steel tempered to an appropriate hardness. Blanks come from Kenya and appear to be quite well made. At the above factory, the blanks are found on abrasive stones that are constantly being redressed and renewed in-house. After sharpening, the pangas are treated with some sort of liquid anti-rust compound and dried. Wooden handles produced in the rough elsewhere are sanded and riveted to the panga and are ready to be shipped. They are sold to the Coops at USh/500 (about U.S.$/6) and subsequently sold to farmers at USh/650 (about U.S.$/7.50). This price is about one-half U.S. prices and certainly less than other parts of the world. A significant number is sold for export and eventually a sort of in-band opertion is contemplated.

We suggested that, with the addition of a small tempering furnace and possibly a press and dies to stamp the blanks, if one is not available the blanks could be obtained from East African Steel and thus some foreign exchange could be saved and even some foreign exchange earned since most of the pangas are exported.

We also suggested that they make their own handles out of a dried eucalyptus which is plentiful in the area. Raw eucalyptus is unsatisfactory and so an exotic hardwood from the Jinga area is used at some significant expense over in-house production from dried eucalyptus. They will experiment crudely and success is highly possible and if successful, they will convert their entire production of handles to in-house.

There was no discussion of a tapered blade which might have to be produced by forging or expensive die rolling, and we did not bring the subject up. We consider the panga being produced as eminently satisfactory. It is simple and cheap and certainly made and sold at a reasonable price. Any attempt to add an exotic feature to the present design would duly increase the cost and thus possibly decrease the market. It is very similar in all respects to machetes we have seen in other parts of the world. Incidently, the selling prices renders a 55% margin of profit to the manufacturer!

In any case, the pangas are a useful agricultural tool and some liaison with East African Steel or UGMA might be mutually beneficial to the agricultural sector and E.A.S.

## JAGGERY (CRUDE SUGAR)

Jaggery is a very, very crude sugar produced from cane juice obtained by very inefficient crushing. The cane juice is evaporated in open pans (cascading through four stages to the final pan which is nearest to the source of heat). Needless to say, the product is produced from run-of-the-field cane and so contains some foreign matter. It also contains the molasses factor and due to the heat, there is significant carmelizing. The result is a black, viscous liquid which is drained into containers about the size of a two gallon water bucket where it hardens. It is removed and placed in 45k burlap sacks and sold for USh/2500--equivalent to about U.S.$/.30 per pound). This compares to a current price of about U.S.$.75 per pound for white sugar. We did not inquire about the profit factor but it is obviously profitable as they stay in business and apparently have no problem selling the product.

It is used principally for fermentation and distillation to a local drink (Waragi). A small percentage is used as a household sweetner.

The principal problem is that the bagasse contains 60% moisture (a fact we confirmed twice) and so only a small percentage (about 100%) is useable for a heat source for the evaporating pans. The owner had been solicited by an Indian source who had designed an inclined, draft restricted, forced air furnace which would accomplish the heating but could be fired by the wet bagasse. He wanted help in designing and installing the furnace. We suggested he take the crude design to UGMA who could produce a blower and the shell for the furnace, then line the furnace with fire brick to produce the venturi effect at the mouth of the furnace, and thus use the very wet

bagasse. (Such a degree of moisture indicates that a considerable amount of sucrose is being lost.) There is a large pile of bagasse on hand that used under the present furnace, in addition to expensive and scarce wood, is air dried but still contains an excessive quality of moisture.

The real problem is the inefficient crane crusher which leaves so much moisture in the bagasse in the first place. But, apparently, this is the same equipment used in many small jaggery mills.

We will try to find a better crushing machine, similar to that used in some parts of the U.S. for making sorghum syrup and offer the design to Mr. Sakagala. It hardly seems likely that the small installation would justify the presence of an IESC type, even if one were available with these unusual talents.

Mr. Sakagala is a very enterprising individual. He raises vegetables and peanuts and has engaged in poultry and dairy farming. He employs about 1609.

The implications of improving crushing and evaporating technology are considerable since there are unofficially, about 2000 jaggery mills in Uganda, most smaller but very few larger. With ancillary occupations, the jaggery business supports about 200,000 families and so is a significant part of the Ugandan economy, notwithstanding the moral considerations of the fact that a principal result of these operations is an alcoholic beverage. It is unlikely that the jaggery could be diverted to the sugar mills even if it were technologically possible to feed it into the sugar refineries for conversion to white (or even the brownish sugar commonly used) if only because of the scattered locations of the jaggery operations and the difficulty with

transport.

A low-key investigation of the cane-crushing problems will be done at the Uganda AID Mission and perhaps elsewhere but it would not be within the purview of the AID assistance program to make a prodigious effort in the direction of jaggery production. Mr. Sakagala is a very ingenious man and he will probably profit from our suggestions. He is still of the opinion that he needs the Indian "inventor" of the wet bagasse burning to install the equipment and fine-tune it for his operation. But that is his problem and AID would not profit from being a participant.