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**Final Report on Seed Multiplication
Uganda: PL 480 Program
617-0802-G-00-4000-00**

**Prepared for:
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December 30, 1994



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Ron G. Gollehon
President

MEMORANDUM

TO: CHARLES KABUGA, CHAIRMAN, PL-480 PROGRAM
REVIEW COMMITTEE

FROM: VICTOR AMANN, ACDI *Victor Amann*

DATE: DECEMBER 30, 1994

SUBJECT: FINAL REPORT ON SEED MULTIPLICATION

Attached you will find five copies of the report "A Proposal To Develop A Sustainable Integrated Edible Oil Industry In Uganda" The paper sets out 9 major components to achieve an integrated program.

In addition, some research and consultancies are proposed to set benchmarks so progress can be measured over time. The funding will be provided from the PL-480 Monetization Program, so I send it to you for your Committee's consideration.

c.c Gary Bayer, ADO/USAID
Bernie Runnebaum, PL-480 Program Manager
• Z.M. Kwebiha, Chairman/UOSPA
Joshua Walton, ACDI Vice President/Africa Region
Sandra Blanchard, ACDI Regional Representative/Africa
Rita Laker Ojok, Country Representative/AT/Uganda.
Dirk Van Hook, Director, Marketing Division/Cooperative Bank.



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**A PROPOSAL TO DEVELOP A
SUSTAINABLE INTEGRATED
EDIBLE OIL INDUSTRY IN
UGANDA.**

**SUBMITTED TO THE PL-480 PROGRAM REVIEW COMMITTEE
BY THE UGANDA OILSEED PROCESSORS ASSOCIATION (UOSPA)**

**Victor F. Amann
ACDI Consultant**

December 30, 1994

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A PLAN OF ACTION FOR DEVELOPING A SUSTAINABLE
INTEGRATED EDIBLE OIL INDUSTRY IN UGANDA.

INTRODUCTION AND BACKGROUND

Per capital edible oil consumption in Uganda is only 2.2 kgs which is among the lowest in the world. Uganda imports over 80 percent of its oil requirements because it lacks adequate supplies of raw material from which to extract oil. There is abundant crushing capacity, much of which is underutilized or setting idle.

The main constraint to oil self-sufficiency is not lack of processing capacity. By 1993, 42 small oil mills had been installed in Uganda. Twenty seven more are expected by the end of 1994. In addition, two new large-scale mills have been installed since 1988 and several of the long silent Asian mills are under reconstruction. Operating 300 days per year, at 8 hours per day, the 69 small expellers that will be installed by 1994 could provide 12,000 mt of edible oil per year by crushing high-oil-content sunflower. Small-scale processing of oilseeds could contribute up to 56% of projected national edible oil demand by the year 2000. Currently operational medium-to large-scale processing capacity could crush 117,000 mt of oilseeds per annum, making a total industry capacity of 168,250 mt/yr. Depending on the raw material being processed, this capacity could produce between 29,500 and 44,750 mt of oil per year and exceed the national demand for liquid cooking oil projected for the year 2000.

The ongoing oilseed multiplication scheme was initiated under the Cooperative Agriculture and Agribusiness Support (CAAS) project in 1992 with funding provided by the PL-480 Monetization Program. The initial agreements negotiated with large scale private farmers who contracted to multiply sunflower seed from certified seed produced by the Uganda Seed Project were abandoned at the end of two seasons because of low output, resulting mainly from lack of experience in sunflower production. In late 1993 seed production was moved to the Ministry of Agriculture's, Namulonge and Serere Research Institutes plus the Kakira Sugar Works and two medium scale farmers. The production results were greatly improved but the cost per unit of output rose markedly.

During the second rains of 1994 a combination of Research Stations, NRA Farm, Prison Farm, private farmers and the Kakira Sugar Works are producing 165 hectares of sunflower and 138.8 ha. of soybean (see attachment 1). During this rainy season, the responsibility for the seed multiplication scheme was proposed to be shifted from the CAAS project and the Uganda Cooperative Alliance to the newly formed Uganda Oil Seed Processors Association Ltd. (UOSPA) as soon as funding to do so is approved and available. Funding to support the seed multiplication scheme over the next two years will be obtained from the PL-480 edible oil monetization program.

This paper proposes a two year plan of action for the operation and possible commercialization of the oil seed multiplication scheme under the UOSPA.

OBJECTIVES OF THE EDIBLE OIL INDUSTRY DEVELOPMENT PROGRAM are: 1) To increase production of high quality and high oil content oilseeds and make it available to a wider range of farmers; 2) to increase incomes of oilseed producers and processors; 3) increase domestic edible oil production with a view to achieving self-sufficiency; 4) to make the seed multiplication scheme sustainable so the edible oil industry can be fully revitalized and 5) to increase the general level of nutrition for all Ugandans.

THE NECESSARY COMPONENTS OF A SEED MULTIPLICATION SCHEME:

A planned approach to increasing oil production entails a several component program. These were conceived by a Committee set up by the UOSPA Board of Directors. The components, in order of priority, include;

1. Produce adequate seeds under the Edible Oil Industry Development Program to meet the needs of producers so oil production can expand to meet annual oil production targets.
2. Set up a Revolving Fund to make loans to small and medium scale oil millers. The first trial should be initiated early enough to purchase seed produced in the second rains of 1994.
3. Develop and fund an extension program in six districts in Northern and Eastern Uganda. Emphasis of the program will be on production of sunflower, soybean and simsim seeds.
4. Set up a revolving fund to make loans to private farmer seed multipliers. This should be initiated in the first or second rainy season, 1995 on a trial basis.
5. Expand the role of the newly installed rhizobium production laboratory at Kakira Sugar Works to provide its product nationwide.
6. Fund a consultancy to study the feasibility of fabricating spare parts for oil mills in Uganda.
7. Organize and carry out an Oil Millers training program as a follow-on the one held in January/April, 1994.
8. Set up a training center for oil millers.
9. Conduct the necessary baseline studies to provide data to enhance proper monitoring and evaluation.

PROPOSED PROGRAM TO INCREASE EDIBLE OIL PRODUCTION

The Components of a program to develop expanded oil production are laid out above. These will now be discussed, in order of priority.

- A. Seed Multiplication Expansion so farmers can meet the raw material production needs of oil millers so they can achieve the annual oil production goals in the future. The following list of assumptions provides the basis on which the seed multiplication program can be planned.

Assumptions for Sunflower:

- i) That the seed multiplication scheme would supply approximately 30% of the seeds required to meet total annual edible oil production targets.
- ii) Average yield on farmers fields - 500 kg/ha
- iii) Area planted is estimated at a seeding rate of 6 - 8 kg/ha. or 125 ha/m.t. of seed.
- iv) Average yield/ha. for seed multipliers is 650 kg.
- v) It requires 3.5 m.t. of high oil content sunflower seed or 6.7 m.t of soybeans to produce one m.t. of oil.
- vi) Oil production target for 1995 equals 10,000 m.t.

Using the above assumptions, an area of 70,000 ha. of sunflower would be required. Seed requirements per season would be calculated by taking 30% of half this area which would equal 84 metric tons/season or 168 m.t/year, requiring 254 hectares of planted area. If the oil output target for 1996 is set at 15,000 m.t. of oil the area planted would increase to 105,000 ha., requiring the seed multiplication scheme to produce 252 m.t. of seed on 387 ha. of multiplication area or 195 ha/season.

The total oil supply of the country will not come from sunflower seed alone because there is a drive to increase cotton production which will provide some oilseed, even though the required cottonseed to produce one ton of oil is nearly 3 X that of sunflower. Additional oil will be extracted from soybeans, and simsim, depending on their prices for export or alternative uses. Soon safflower will be introduced at the farm level as an added oil crop. Farmers who raise sunflower seed are strongly recommended not to plant their own seed more than one season. This means each farmer should purchase new seed, at least once per year.

Possible and Potential Seed Multipliers

The farmer or institutional seed multipliers should have large enough fields, especially for the production of sunflower, to reduce the incidence of cross pollination (unless the farm is very isolated). Ideally, the minimum size sunflower field should be at least ten hectares separated from other open pollinated sunflowers of different varieties by a distance of one mile. Experience with large scale farmers and institutions during the past 3 years has shown that Ministry Research Stations perform fairly well as producers, but their

per unit costs are extremely high. The long-term objective should be for the scheme to contract with large scale farmers, who have a proven capability as seed producers. This move should be made as soon as possible. There are several known and possible production sites, 60% of which are private farmers who have produced seed for the scheme. These include:

Institutions With Successful Experiences As Seed Producers

- | | | | |
|----|----------------------------|---|-------------|
| a) | Serere Research Institute | - | Soroti |
| b) | NRA Farm | - | Kiryandongo |
| c) | Isimba Prison Farm | - | Hoima Road |
| d) | Namulonge Research Station | - | Namulonge |
| e) | District Farm Institute | - | Ngetta |
| f) | Prison Farm | - | Tororo |

Private Farmers with whom we have successful experience.

- | | | | |
|----|--------------------|---|-------------------|
| h) | Wamburu Bros Farm | - | Mbale (Moroto Rd) |
| i) | Ismail Lukumu | - | Masindi (Kyatire) |
| j) | Green Bros. Farm | - | Soroti |
| k) | Mary Nyangoma | - | Masindi (Kituka) |
| l) | Kakira Sugar Works | - | Kakira |
| m) | Karokora Zedekia | - | Masindi |
| n) | Moses Magenyi | - | Masindi (Kituka) |
| o) | Dan Wanyela | - | Masindi (Kyatire) |

In the short-run the scheme will most likely have to depend on some institutional producers. However, they should shift to concentrating production on large scale farmers who will multiply seed on a commercial basis. The number of farmers involved in any one season should be held to a minimum. Institutions seem to charge non-project costs such as incentive allowances and other institutional allowances for professional staff thus the excessively high unit cost of seeds produced at institution. Private farmers do not incur these types of costs.

Seed Production Cost Experienced To Date

Since the scheme started producing seed on institutional and private farms, funds are released on the basis of a budget proposed by the institutions or private farmers at the beginning of the season. Funds are released in tranches based on accountability for funds previously received. The system worked from the standpoint of expanding output when compared to the initial system of working with three inexperienced large scale farmers.

However, the cost of seed rose sharply, especially at the Government institutions as illustrated in Tables 1 and 2 which show actual costs of sunflower and soybean production for two seasons. Namulonge Research Institute is consistently the highest cost institutional producer for both crops. Kakira Sugar Works is in all cases the lowest cost producer because it covers all costs, takes no advance, and receives 160% of Kampala oil factory gate for delivery to the Magric Warehouse

in Kawempe. The example set by Kakira should be the goal of the entire program. Hence, the proposal for a seed multipliers' revolving fund suggested below. In order to make the program viable, seed producers will have to cut cost and increase output beyond the present low yield per unit of area planted. The Wamburu Bros. Farm showed the lowest cost (next to Kakira) in sunflower production during last rains, 1994. The yield was 505 kg/ha and cost of seed was US\$ 432/kg or 20% of the cost of Namulonge Research Institute's sunflower seed.

The Projected Cost of Producing Seed for the future should not be based on average past experience. The cost of sunflower seed produced during two seasons was US\$ 753,852/m.t. Soybean seed produced during the same period cost US\$ 791,060/m.t.

The average cost of producing soybeans was US\$ 516,300/ha. while sunflower production averaged a cost of US\$ 390,015 per hectare. The range per hectare costs of soybean production was US\$ 124,076 to 1 million. Per hectare sunflower production had a cost range of US\$ 86,390 to 625,500. The variation is largely due to two factors 1) yield per hectare and 2) high labor costs. In all but one case the institutions were the highest cost producers. In order to make this program viable, cost per hectare must be reduced. During the last rains, 1995 it is recommended that private farmers should receive a maximum advance of US\$ 250,000 per hectare contracted under the program.

Income From Seed Sales To Farmers must be a future objective of the program. In the past farmers were issued seed at planting time with the agreement that they would repay the seed they received to plant when they harvest. This was increased from one-for-one kilogram to two-for-one kilogram in the second rains, 1994. Needless to say, the program has not worked for several reasons. (1) the seeds distributed by an oil miller were sold after harvest to another miller; (2) oil millers collected the seed from the farmer and kept the proceeds; or (3) the oil miller sold the seed to farmers who in-turn felt no obligation to repay.

Beginning with the distribution of seed for the First Rains in 1995, it is proposed that farmers pay cash for the seed they receive for planting before they receive it. This price would initially be below production cost but will increase each season as suggested below in table 3.

The seed produced during the second rainy season in 1994 will be the first seed sold. It is estimated that 100 metric tons will be produced. Sunflower seed available for sale and seeding for the first rain's, 1995 consist and estimated 100 metric tons produced in the second rain's crop, 1994 plus a 25 metric ton carryover from the previous rains. Soybean availability is estimated at 175 metric tons from the crop presently under production plus a 15 m.t. carryover.

TABLE 1.

SEED MULTIPLICATION SCHEME INCLUDING LOCATION, AREA PLANTED
BUDGET ESTIMATE, SEED PRODUCED, YIELD PER HECTARE AND
COST PER KILOGRAM OF SUNFLOWER 1993/94

INSTITUTION OR FARMER	HECTARE PLANTED	BUDGET ESTIMATES	SEED PRODUCED KGS.	YIELD PER HA.	COST PER KG.	BUDGET PER HA.
<u>2nd Rains, 1993</u>						
Serere Research Institute	80	38,644,000	42,645	533	906	483,050
Namulonge Research Institute	28.4	13,835,000	10,285	362	1,345	487,147
Kakira Sugar Works	50	19,640,000	51,248	1,024	372	380,000
Total	158.4	71,519,000	104,178	1,919	-	-
Average	-	-	-	657	686	451,508
<u>1st Rains, 1994</u>						
Serere Research Institute	50	29,384,500	23,974	479	1,226	587,690
Namulonge Research Institute	24	11,970,000	5,575	232	2,147	498,750
Kakira Sugar Works	50	4,319,540	10,881	217	397	86,390
Wamburu Bros. Farm	40	8,750,000	20,226	505	432	218,750
Green Bros. Farm	20	12,510,000	6,720	336	1,862	625,500
Agro Expo	8	3,640,000	4,736	592	768	455,000
Masindi Prison Farm	16	5,565,000	5,240	327	1,062	346,812
Alimuqonza Womens Farm	56	17,084,400	37,272	665	458	305,078
Total	264	93,223,440	114,624	-	-	-
Average	-	-	-	434	813	353,119

TABLE 2 SEED MULTIPLICATION SCHEME: INCLUDING LOCATION, AREA PLANTED, BUDGET ESTIMATE, SEED PRODUCED, YIELD PER HECTARE AND COST PER KILOGRAM OF SOYBEANS 1993/94

INSTITUTION OR FARMER	LOCATION	HECTARE PLANTED	BUDGET ESTIMATES KGS.	SEED PRODUCED	YIELD PER HA.	COST PER KG.	BUDGET PER HA.
<u>2nd Rains, 1993</u>							
Kakira Sugar Works	Kakira	10	1,240,760	3,564	356	348	124,076
Agro Expo	Mubende	6.5	5,260,000	7,010	1,078	750	809,230
Namulonge Research Institute	Namulonge	10	9,000,000	5,200	520	1,730	900,000
Total		26.5	15,500,760	15,778	-	-	-
Average		-	-	-	595	983	584,934
<u>1st Rains, 1994</u>							
Serere Research Institute	Soroti	30	13,492,500	33,005	1,100	408	449,750
Namulonge Research Institute	Namulonge	10	10,000,000	9,288	928	1,076	1,000,000
Kakira Sugar Works	Kakira	10	1,991,340	5,251	525	379	199,340
Lensacres	Mpigi	10	6,920,000	2,924	292	2,366	692,000
Kikafunda	Mpigi	15	4,500,000	-	-	-	-
Total		75	36,903,840	50,468	-	-	-
Average		-	-	-	672	353	492,051

TABLE 3.

SUGGESTED PRICE OF SUNFLOWER AND SOYBEAN SEEDS PAID TO UOSPA
REVOLVING FUND AND DISTRIBUTED TO FARMERS AT THE TIME OF PLANTING,
DURING THE NEXT FOUR RAINY SEASONS.

Season	Sunflower			Soybean		
	Amount(m.t)	Price/kg (UShs)	Value (mil)	Amount	Price/kg(UShs.)	Value (mil)
1st Rains 1995	125	250	31.25	190	300	57
2nd Rains 1995	84	275	23.1	60	350	21
1st Rains 1996	126	300	37.8	60	400	24
2nd Rains 1996	126	325	40.9	60	450	27
Total			UShs. 133.05mil =====			UShs. 129mil =====

The estimated seed production will be paid on delivery. However, past experience shows a loss of six percent in cleaning. In addition, four percent losses should be added for losses in storage and perhaps, low sales because many farmers are reluctant to purchase planting seed. Despite the losses, farmers are paid for the seed they deliver but only the balance can be sold. (This is taken into account in Table 4.)

Table 3 shows the suggested price farmers pay for seed into the UOSPA revolving fund. If the oil miller needs to cover his costs of distribution, he will have to set a margin above this price to cover these costs. The extension service cost of seed distribution will also be included in the extension budget presented below.

Oilseed prices paid to farmers are assumed to be fairly stable with a slight rising trend of 5%/season. The initial price of soybeans is assumed at UShs. 250/kg and sunflower at UShs. 200/kg. Seed multipliers will be paid 160% of oil factory gate price (this is described in more detail below).

Funds will be required to pay the balance over and above the advances farmers received for production of the 1994 second rains crop. The only farmers which may receive a balance would be those in the Masindi area and Kakira Sugar Works. Masindi farmers have 73 ha. under soybeans and 44 hectares under sunflower. If we assume sunflower yields at 750 kg/ha and soybean yield at 1.2 metric ton, the crop will cost as follows: Sunflower 33,000 kg at UShs. 320 equals a cost of UShs. 10,561 million, and 87.6 metric of soybeans at UShs. 400/kg equals a value of UShs. 35.04 million or a total cost of UShs. 45.6 million subtract from this UShs. 28.28 advance leaving a balance of UShs. 17.32 million.

Kakira Sugar Works received no advance for producing 50 ha. of sunflower and 10 ha. of soybean seed.

Using the same assumptions as above for production and price, the sunflower production would be 32,500 kgs valued at UShs. 10.4 million. Soybean production would be 12 m.t., valued at UShs. 4.8 million. Total balance due to pay for sunflower and soybeans for second rains 1994 crop equals UShs. 32.52million.

TABLE 4.

COST OF MULTIPLIED SEED DURING FIVE SEASONS INCLUDING BALANCE
FOR 1994 SECOND RAIN CROP AND FOUR SEASONS 1995/96.

Season (Rains)	Sunflower			Soybean		
	Amount(m.t)	Price/kg (UShs)	Value (mil)	Amount	Price/kg(UShs.)	Value (mil)
1st Rains 1995	84	336	28.2	60	420	25.2
2nd Rains 1995	84	352	29.6	60	441	26.5
1st Rains 1996	126	370	46.6	60	463	27.8
2nd Rains 1996	126	388	48.9	60	486	29.2
Total			<u>UShs. 153.3mil</u>			<u>UShs. 108.7mil</u>

	Million Shs.
Balance to Purchase 1994 crop	- UShs. 32.52
Cost of 4 future season's crop	- 262.00
Total crop purchases	UShs. 294.52
Less : Value of Seed Sale (Table 3) (less 10% loss est.)	236.00
Add : UShs. 125/kg for cleaning & bagging	99.90
Add : UShs. 30/kg to transport to distribution points.	26.40
Total Required from PL-480	<u>UShs. 183.82</u>

If seed producers' costs are reduced, the unrecovered funding would decline. This is a strong justification for dropping high cost producers identified in table 1 and 2 above.

Distribution of seeds will be through members of UOSPA and the extension service as described in the section on extension and participatory research below. A budget item for transporting seeds to distribution points, averaging US\$ 40/kg will be included in the budget.

B. OIL MILLERS SEED PURCHASE LOAN SCHEME AND REVOLVING FUND

Some progress has been made in alleviating the main constraint for oil millers through the oil seed multiplication scheme initiated under the Cooperative Agriculture and Agribusiness Support (CAAS) project. Uganda has many small and medium scale oil mills which are not operating fulltime and many are silent. This situation is usually a function of owners' heavy indebtedness for purchasing capital goods and infrastructure with no provision for working capital. Consequently, the oil mills stand idle a good share of the time while the mill owners' overheads and fixed cost continue.

Many components of the CAAS project were funded by the PL-480 Monetization Program, with a large share of the funds going to the Cooperative Bank to support agricultural development. Crop loan funds are available but most oil millers are unable to borrow because of heavy capital investment indebtedness to other lending institutions.

In September/October, 1994 the PL-480 Monetization was evaluated and one of the recommendations was to more sharply focus remaining PL-480 fund expenditures on restructuring and recapitalizing the Cooperative Bank with new emphasis on setting up an integrated edible oil industry development program. One component of such a scheme would be to provide loan funds for small and medium scale oil millers to enable them to purchase raw materials. This section, of this paper proposes that a fund should be set up as an oil millers loan scheme with a built-in loan guarantee mechanism. Loan funds for small and medium scale oil millers are an integral part of Uganda's edible oil industry revitalization program.

The Pilot Oil Miller Seed Purchase Revolving Loan Fund: should be initiated in the harvest season starting in December, 1994. The proposed participants are millers with whom the UOSPA Board of Directors, UCA, and the Cooperative Bank have had dealings. Some have applied for bank loans but have been unable to qualify because of indebtedness to other banks or agencies for loans to purchase their processing equipment. Nevertheless, if they had working capital they could service their current equipment loan and the working capital loan.

The shortage of working capital causes the recommended borrowers', mills to have a large amount of 'down time' because of lack of raw material. A higher proportion of running time would improve cash flow so borrowers can service their revolving fund loan. The attached cash flows are for mill sizes of 6-4-1 and 1/2m.t per day. (See attachments 2,3, 4,5, and 6).

The cash flows are positive but borrowers must understand that repayments should be 6 monthly payments per buying season and each payment should include principle and interest; not the usual method of repayment of interest only. The margins are narrow but acceptable, if borrowers are very diligent in their repayment and purchase schedules. The cash flows include an assumed input of owner's equity to supplement borrowed funds. Owner equity increases from UShs. 2 million for 1/2 ton per day mills to UShs. 30 million for 6 ton per day mills. All mills are assumed to operate at 70% of capacity and all are assumed to have some available working capital.

Proposed Participants

The UOSPA is recommending that a maximum of five millers be included in the pilot scheme. The final determination would be made by the Cooperative Bank. Those included in the recommendation are:

1. Bugiri Women Cooperative Group - 1/2 ton/day - Bugiri
2. Kesyman Oil Millers - 1 ton/day - Bugiri
3. Basemy Oil Industries - 4 ton/day - Kitgum
4. AFYA Estates Ltd. - 4 ton/day - Mbale
5. Uganda Kolping Society - 5 ton/day - Hoima
6. Akony Kori Co. Ltd - 6 ton/day - Lira
7. Musenze Industries Ltd - 8 ton/day - Buwenge

These recommendations were based on existing and potential performance. Gender also plays a role because three of the seven mills are owned by women and most are viable operations at the present time. These include Bugiri Women Cooperative Group, Akony Kori, and Basany Oil Industries. The list also provides a wide geographic distribution, but all are relatively near to a Co-op Bank branch.

Based on the cash flows and the proposed oil mills' previous performance and assuming all to operate at 70 - 80% of capacity, the fund is proposed to begin with UShs. 165 million. However, the amount of UShs. 500 million suggested to the evaluators should be put into the fund over the life of the project. This could accommodate millers from all size categories. In addition 10% of the initial tranche, or UShs. 16.5 million should be set aside as a loan guarantee fund.

The Loan Guarantee Fund would be started with an equivalent of 10% of the loans made under this scheme. The loan guarantee fund seed money of UShs. 16.5 million would expand by inputs from the borrowers. The Bank has a policy of refunding to the customers, who pay on time, one half of the Loan Processing Fee which is 3% of the loan. This amount would be paid into

the loan guarantee fund. If all loans were paid on schedule; the guarantee fund could grow US\$ 2.25 million per crop season at this proposed level of lending.

If this pilot scheme works, it could be expanded to include a wider group of oil millers. The lack of working capital is the most frequent concern of oil millers. This scheme, used wisely by both borrowers and lenders, could help improve oil production and millers incomes. It would also raise the enthusiasm of millers to participate in the seed distribution portion of the seed multiplication scheme. Participating oil millers would have a greater chance of having seed available to crush at harvest time and beyond. They would, in addition, have a more tangible means of recovering seed that farmers received during the second rains, 1994 planting time or loan.

C. PROPOSED NATIONAL SYSTEM OF FARMER PARTICIPATORY RESEARCH AND EXTENSION PROGRAM FOR OIL SEEDS.

Because sunflower is a relatively new crop, farmers are not very familiar with its production. Yields of the traditional varieties are low because most farmers broadcast and intercrop their sunflower. The retained seed that is used for planting is usually highly genetically mixed due to cross-pollination. The resulting low oil-content and hard seed coat make the cost of raw materials very high and contributes to excessive wear and tear on milling equipment. Constraints to both input and output marketing discourage farmers from increasing their production of the high-oil-content sunflower varieties that would maximize the quantity of oil resulting from a given quantity of sunflower produced and crushed. Sunflower is also a crop which extracts a lot of nitrogen from the soil. Research has shown that the use of commercial fertilizers is generally not economical for small subsistence sunflower producers. The use of appropriate crop rotation practices and organic fertilizers are very important to controlling fungal diseases in sunflower and preserving soil fertility. To increase the amount of pressing seed available, relevant farm level research and extension efforts to increase farmer knowledge about the role of oilseeds in the farming system are needed.

High oil content Sunfola, an open pollinated variety of sunflower, was introduced to Uganda under the USAID funded Manpower for Agricultural Development Program (MFAD). Unfortunately, the on-farm testing that was done for sunflower under this project involved heavy use of commercial fertilizer that was provided free to participating farmers. No attention was paid to questions of crop rotation, organic fertilizer and intercropping as methods to preserve soil fertility and to control disease. Because of insecurity, most of the on-farm testing was done outside of the major sunflower production areas. As a result, the findings from this on-farm testing program hold little relevance for small scale subsistence farmers in Northern Uganda. Recognizing this problem, the CAAS Core Committee has just recently approved funding for a pilot project in Lira and Apac Districts to establish a system of farmer participatory research and extension. In

recognition of the importance of increasing raw material availability as a necessary condition for the revival of the edible oil industry in Uganda, it is proposed that this pilot program be expanded to include the major sunflower producing area.

UOSPA proposes that AT(Uganda) act as the coordinating body for this effort as a subcontractor to UOSPA. By cooperating with the Ministry of Agriculture and drawing on the resources of interested NGOs, Cooperatives and Millers in the major producing areas, the system can be launched quickly and at a relatively low cost. By stressing the participatory aspect of the research, and working very closely with interested groups of oilseed producers, it is hoped that the system can be sustained under the control of a national oilseed producer's association after the end of project funding.

Project Activities

The proposed project will build on the experiences of the Lira/Apac pilot project to design a system of farmer participatory research and extension which will have been operating in the field for 6 months by the time the expanded project gets started. This expanded network will be able to coordinate efforts to promote increased oilseed production and productivity through distribution and promotion of the improved oilseed varieties, participatory research on oilseed production, and a nationwide dissemination of the research findings through a media promotion campaign. Because the expanded project will work in 6 additional districts, its impact on oilseed production in Uganda will be far greater than if the project focussed only on Lira and Apac Districts.

It is proposed that the expanded oilseed research and extension effort work in 6 districts in addition to the pilot project zone of Lira and Apac. The proposed additional districts are Gulu, Kitgum, Masindi, Hoima, Mbale and Kumi. The final decision regarding participating districts will depend on a number of external factors, however, these factors include the following:

- i) Updated information on oilseed production in each district.
- ii) The availability of a local NGO, Cooperative, Processor or other organization willing and able to take on responsibility for district level supervision, logistics and disbursement of funds.
- iii) Security and ease of movement in the area.
- iv) Degree of interest and cooperation on the part of District level authorities and Ministry of Agriculture staff.

It may be possible to combine the major oilseed production areas from two or more contiguous districts under the supervision of a single agricultural officer if distances and road conditions allow. Final decisions regarding the design of supervision areas will be part of the overall project design activity which is scheduled to begin as soon as funding is approved.

1. Support and Develop an Effective Seed Distribution System.

To maximize impact, the seed multiplication system will require an effective seed distribution network. While seed distribution through UOSPA's member oil mills is a major step in making seed available to farmers, most mills are still located in major urban areas. This means that seed accessibility is likely to be a problem for farmers deep in the villages. This research and extension effort will identify and train cooperating government extension agents to handle seed sales as well as provide follow-up and extension advice to farmers. Performance based allowances will be provided for these selected Ministry of Agriculture staff. Such an approach is directly in line with the government policy of a unified extension system which cooperates with donor activities in the agricultural sector. In addition, the project will cover the costs of training, supervision, transportation, and logistical support.

2. Hire a National Coordinator Plus One Supervisor for Each District or Zone

AT (Uganda) proposes to hire a national coordinator to ensure that project design and implementation are conducted in a manner that involves the small oilseed producers in problem identification, testing of alternatives, evaluation of performance, definition of recommendations and dissemination of information to other producers. Technical assistance will be provided to help design the details of the implementation and monitoring plan as well as to conduct the project evaluation. The national coordinator will be responsible for the selection, training, supervision and coordination of the District level supervisors. Each district supervisor will work with a team of Ministry of Agriculture staff selected to work directly with cooperating groups of oilseeds producers.

3. Mobilize Farmers Through Participatory Research

Sunflower is a relatively new crop in Uganda. Very little is actually known about how it fits into the farming system. Formal research tends to isolate the analysis to just a single crop, ignoring the potential complementarities between activities. As a result, the information and recommendations they produce are not always directly relevant to small farmers. The oilseed research results from the Ministry of Agriculture have

not been adequately tested for relevance to small subsistence farmers. The limited information which is available is currently going to waste for lack of an extension medium for disseminating it to farmers. Individual small processors are not going to be able to provide such extension services.

Participatory Action Research (PAR) is an approach that has been tested in many places as a solution to the problem of lack of research relevance to small farmers. PAR encourages small farmers to form themselves into interest groups. Special participatory research methods are then employed to build on farmers' existing knowledge to design experimental activities of direct relevance to improving the productivity of the existing farming system in a manner that is appropriate to the level of resources and the constraints subsistence farmers actually face.

There are many topics that farmers themselves are best qualified to address. Possibilities include:

- i) crop rotations to control disease and improve soil fertility,
- ii) the potential use of oilseed cake and other organic matter as a mulch or fertilizer²,
- iii) bird control strategies,
- iv) further variety testing for both oil content and yield,
- v) improved storage methods to reduce losses in sunflower
- vi) the use of cake in local livestock production and fish farming, and
- vii) the relationship between bees, sunflower production and honey.

² In remote rural areas where there are very few animals due to the rampant cattle rustling and insecurity of recent years, there may be minimal demand for cake as feed. If households are converting oilseeds to oil at the village level using the ram press, the cake may accumulate faster than it can find an immediate local market. If the area is isolated, it is very possible that the cost of assembly and transportation to one of the commercial feed producers in southern Uganda may exceed the value of the cake. (Small oil millers in the north also complain about the lack of demand for cake). Oilseed cake, however, is high in nitrogen. One of the farmers' major concerns is that sunflower and uninoculated soybeans are heavy nitrogen extractors and their production may lead to a degeneration of soil fertility. While commercial fertilizers are not economically viable for small producers, mulching with the cake may be a sound solution to this problem. This suggestion was made by Dr. Simkins. It is a possibility that warrants testing and proper economic analysis.

Farmers want to know more about the role of oilseeds and oilseed processing in their own farm enterprises, and how it can relate to other enterprises such as livestock, beekeeping, fishpond, animal traction, etc. Using the methods of participatory research, it is possible to assist these farmers to optimize the impact of oilseed production on their incomes and well being. Interested oilseeds producers will be encouraged to organize themselves into groups. These interest groups will form the nucleus of activity for all of the participatory research efforts.

4. Disseminate Research Results Nationally

The results of the participatory research will be disseminated on a national basis through an extensive media campaign. In addition, AT (Uganda) will cooperate with such national forums as the Uganda Oilseed Processors' Association and the Uganda Farmer's Association, so that information can be more readily circulated to farmers throughout the country. In this way sunflower researchers from the National Research Organization will be provided with important feedback from the intended users.

5. Encourage and Develop a National Oilseed Producer's Association

AT (Uganda) intends to promote the development of local associations of oilseed producers. There are many roles which a farmers' associations could play to improve the performance of the edible oil sub-sector in Uganda. Coordination of planting time and locations to reduce bird losses and avoid cross pollination is only possible if farmers are organized. Cooperation between sunflower and honey producers can lead to important mutual benefits within the farming system. Farmers' organizations could act as countervailing force, engaging in joint action to pressure millers and to ensure profitable pricing. If organized, farmers could do their own bulking and wholesaling to capture the benefits of storage and trade speculation. Farmers' organizations also might sell agricultural inputs such as rhizobium and seed.

It is hoped that the organization of PAR groups scattered throughout the major oilseeds producing areas will be the first step to the establishment of a larger Regional Oilseed Producer's Association. By the end of the two year period the farmer's PAR groups should be strong enough to form the foundation for an oilseed producers' organization with a strong grassroots base. A coordination committee will be formed at the District level as well as an executive committee at the National level. Such an organization is needed to encourage coordinated action at various levels. Cooperation at the local level is needed to coordinate planting time, bird scaring, and PAR. Joint efforts on the district or regional level are needed to enhance producer bargaining

power and solve problems of storage, marketing and access to inputs. Cooperation at the national level can play a major role in assisting the UOSPA with seed supply and inputs distribution problems. AT(Uganda) will play a facilitative role in encouraging the development of such an organization. Conferences will be organized to provide farmers with the opportunity to meet and discuss their problems at the sub-country, regional and national level.

Implementation Plan

As soon as funding is approved, AT (Uganda) will recruit the national coordinator, secure technical assistance to prepare a detailed project design and implementation plan, and begin procurement of vehicles and office equipment. It is anticipated that the coordinator will be based in Lira as a central location with an existing office and support staff. Once the coordinator is in place and settled, he/she will begin the process of recruiting district supervisors. The district supervisors will then assist with identifying the cooperating Ministry staff. Once all of the staff have been identified they will go through an intensive orientation and planning seminar. Ideally, representatives of the cooperating host organizations should also be involved in this seminar. The staff of the Lira Pilot project will receive training as trainers and be able to act as primary resource people for the training of staff from the new districts.

The first task once staff are in the field will be community mobilization and organizing farmers' PAR groups at the grass roots level in all Districts. Under the supervision of the cooperating Ministry staff, the oilseed producer's identification. This problem identification becomes the basis for planning the field trials and experiments that are most relevant to each area. Each group will draw up a research plan for the season. The plans of the individual groups will then be compiled into a District research plan. The District research plans will be relevant to staff from the national research institutions.

Based on the discussion and priorities of the PAR groups, the program will encourage and support the emergence of farm level experiments to answer farmers' questions about how to optimize the returns to oilseeds production with Ngetta District Farm Institute and the adaptive research staff of the Ministry of Agriculture based in Lira. Additional resource people will be brought in where necessary to help the farmers initiate these experiments. For example, an experienced beekeeper from the area can be used to help set up farm level experiments on the relationship between bees and sunflower. (Preliminary discussion with farmers indicate that this is an area of major concern to local farmers.) If there is any substantial investment required for the experiments, arrangements will be made for the project to help bear the initial risk. Any long term assets (for example beehives) will then be sold to the farmer group at cost on a lease hire basis. In most cases,

however, the farmers will be encouraged to engage in the experimentation on their own initiative, with the resulting knowledge and produce being their compensation.

AT (Uganda) will arrange for ongoing monitoring and follow-up of the extension agents, and will conduct a media promotional campaign for the improved seed. Arrangements for each subsequent season will be made based on the end of season evaluation for the previous season.

A time line of proposed activities is shown in attachment 7.

Outputs and Indicators

Project outputs will be measured in terms of the quantities of seed sold, the quantities of sunflower oil and seed cake produced, and the level of income generated in the pilot project area. These outputs will be quantified during the course of ongoing project monitoring.

Outputs and indicators for this two year project are as follows:

Output 1: Distribution and sale of 80 increasing to 125 metric tons of improved soft shelled sunflower seed (Sunfola) per season. This will include development of a marketing network and a system of extension support and follow-up. It is estimated that approximately 50,000 farmers will purchase this seed each season.

Indicator 1: This output will be measured by the records of seed distribution and sales through the cooperating extension staff and other cooperating organizations. Sales records will document the number of farmers purchasing the seed each season.

Output 2: Establishment of at least sixty PAR groups which are engaged in activities and experiments to enhance the returns to oilseeds production in the local farming system.

Indicator 2: The activities of these groups and their conclusions will be documented. Major findings will be published in the form of extension materials developed for distribution to local farmers and for circulation among Ministry of Agriculture staff and other interested parties. A media campaign will be run to publicize the results of the PAR on a national level.

Output 3: Facilitation of the development of a national level oilseed producer's organization by the end of year two of the project.

Indicator 3: District level conferences for oilseed producers will be held in the middle of the second year of the project. These conferences will provide the opportunity for oilseed producers to discuss their problems and recommend solutions. Delegates to a national conference will be selected. The national conference of representatives of grassroots producer groups will be held towards the end of the second year of the project. Follow-up assistance in program implementation (including assistance with legal registration of the organization, if that is the consensus of the group) will be provided by AT (Uganda). The minutes of the conference will be published by the project.

Budget

The budget for this activity is provided in Attachment-8. The funding request is in local currency. Any hard currency needs will be met by exchanging shillings through the exchange bureau system. The budget covers primarily the direct costs of the seed distribution and participatory research/extension efforts.

D. SEED MULTIPLIERS REVOLVING FUND:

One objective of this proposal is to concentrate seed production with medium to large scale private farmers as soon as possible. The seeds will be purchased at a premium price to encourage seed producers to: use proper amounts of inputs, ensure optimum plant population and follow cultural practices that facilitates maximum economic yields. Prices will be based on oil mill gate prices at the time and nearest to the place of delivery. Prices offered will be 60% above factory gate prices in the area where seed is cleaned, treated, bagged and stored. For example if a store is located in Lira and factory gate price there is UShs. 150/kg, the seed multiplier would receive UShs. 240/kg for seed delivered to the Lira Warehouse.

On the other hand if seed is delivered to Kampala where the price may be UShs. 200/kg, the seed multiplier would receive UShs. 320/kg for seed delivered at the Kampala Warehouse. This paper proposes that warehouses be obtained in various locations to reduce transportation costs. Possible locations could be Masindi, Gulu, Lira, Kitgum and Mbale or Soroti. These warehouses would not belong to the UOSPA but would be hired from private owners. The Uganda Seed Project at Masindi offered to clean, package and store seed for this scheme. Their quotation is competitive and UOSPA should accept the offer.

A Trial Seed Multiplication Producers Revolving Fund should be set up so selected seed producers can borrow money for seed production to be repaid when seed is delivered to the warehouse. The borrowed funds will be subtracted from the value of seed delivered before payments are finalized. The proposed premium price should make contract seed production profitable. Yields would increase if proper amounts of inputs are used such as pre-emergence herbicides which would eliminate the cost of one weeding and reduce total production cost, plus the application of economic amounts of fertilizer and sprays. The yield of sunflower seed should average at least one metric ton per hectare but at the present time most producers produce approximately 500 kg/ha. In addition to adequate inputs, optimum plant population is equally important. Further, if funds were borrowed, the producers would deliver seed in a more timely manner instead of holding it when it is urgently needed for distribution. The incentive to deliver seeds early would enable seed producers to repay their loans and reduce interest costs.

To finance seed production, a revolving fund providing a line of credit to multipliers should be set up as an administered account in the Cooperative Bank. This fund would essentially be an overdraft facility which would allow seed producer to draw money as he/she requires it throughout the growing season. Interest would only be charged for the days funds are actually borrowed. For example at the season's beginning a seed multiplier may borrow for ploughing, certified seed purchases, pre-emergence weed killer purchases and planting labor costs. Later he would draw funds for weeding and eventually for harvesting and transport to the warehouse. Between seasons funds would be held in the revolving fund.

Successful contract farmer participants should not allow their production costs to exceed US\$ 250,000/ha if they want to make a reasonable profit. The average budgeted expenditure per hectare in the past was US\$ 492,051 to which US\$ 125/kg must be added for cleaning, bagging and warehousing. Under the present cost-plus arrangement used for contracting institutions and farmers in the past, costs are not seriously controlled so the per unit seed cost became so high that the scheme will never be either commercially viable or economically sustainable. Prices suggested above as the multipliers' premium price is at least 10% higher than that offered by the Uganda Seed Projects to its producers. This could be an incentive to producers to enter this scheme.

The initial amount of funds should be made available to cover the cost of planting 128 ha. at a rate of US\$ 250,000/ha or US\$ 32 million. The scheme would begin in the second rains, 1995.

- E. Rhizobium Inoculant will be produced at the Kakira Sugar Works in the new production laboratory which was installed as a one-time grant from the CAAS project. Rhizobium is an integral part of successful soybean production. In order to ensure that adequate supplies are available, the grant provided funding to purchase an autoclave so the peat carrier can be sterilized; the product has at least a one year shelf life.

Presently the management at Kakira is waiting for firm orders before they produce rhizobium. Meanwhile, farmers who are aware of the value of rhizobium and its effect on production are looking for a source of supply. It will be the responsibility of UOSPA and the AT/Uganda extension staff to keep Kakira aware of the current and projected demand for rhizobium so Kakira can plan production of adequate amounts of rhizobium in for soybean producing areas. The costs of production, marketing and advertising should be borne by Kakira according to their agreement with the CAAS Core Committee.

- F. Consultancy on Local Spare Parts Manufacture Capability should be carried out early in the project to determine the capacity of local manufacturers to produce spare parts in Uganda. The consultant would survey the machine shops and foundries in the country to determine their capability of manufacturing or casting spares for oil milling equipment. The length of this survey would be at least 3 weeks and would include some travel to determine the capabilities of potential manufacturers or fabricators upcountry. The consultant should have a broad and practical working knowledge of engineering and parts manufacture.

The consultant could be hired from the Intermediate Technology Development Group (ITDG) on a private basis. At a weekly cost of \$2,530 plus airfare, a 3 week consultancy would cost \$8,600 or US\$ 7.783 million.

G. TRAINING FOR OIL MILLERS

Most small and medium scale oil millers have had little or no training in maintenance, repair or proper operation of an oil mill. Most small scale mills consist of only an expeller and, in some cases, an oil filter. Oil is usually allowed to settle; from this, clean oil is drained and in some cases put through a filter. Most processors have had no training in how to prepare oilseeds for crushing to ensure that the greatest amount of oil can be extracted.

The CAAS project funded two oil miller training courses during the past 12 months. The first was a six week course conducted by Rico Cruz, a VOCA Volunteer, who worked primarily with womens' groups. The second course which lasted 3 months, had training sessions in 6 locations which coincided with locations where machines produced by different manufacturers were installed. The trainer, Derrick Burgess, had a vast amount of oil processing experience. The sessions included hands-on experience in machine maintenance, seed preparation

and oil refining. Seventy-seven participants attended sessions of this training program. However, many participants were oil mill owners; not the oil mill operators who should have attended.

Additional training should be made available, conducted in a manner similar to the Burgess course. The course could again be build around various manufacturer's machines in operating oil mills. The course would be geared primarily at machine operators and operatives. Participant would be asked to cover costs of transportation, housing and subsistence. Training could be more, in-depth on machine operation, maintenance and trouble-shooting.

The course should be scheduled to last at least six, one week sessions to allow for specialized training on various manufacturer's machines. A trainer could be hired on contract with the Intermediate Technology Development Group (ITDG) located in Zimbabwe. At a daily rate of \$200 plus per diem of \$190, the weekly cost would be \$2,530. An eight week consultancy including airfare and 26% overhead would cost \$25,500 or UShs. at UShs 920/\$1 = 23,460,000 Uganda Shillings.

- H. Proposed Training Center for small and medium oil millers where participants can receive hands-on training over an extended period of time so they can learn all procedures from seed preparation to decortication, winnowing, expelling oil, setting, filtering, refining and marketing could be financed. This is the lowest priority component of this proposal.

The ideal setup would be a separate training school which would contain machines produced by several manufacturers so student could learn how to operate and maintain the type of machine they operate. The basic principles could be demonstrated by using on Indian, Chinese and European manufactured machine. The training center should ideally be set up outside of Kampala, perhaps in Lira, near raw material supplies and in a rural setting where all the hazards e.g. power shortages etc. which small millers encounter would become real teaching problems and experiences. Mill owners should cover their costs for participating in the course as well as those of their mill operators and technicians.

If the training unit were set up, as a training school/oil mill, it could be self-financing. The proceeds from oil and meal sales plus fees from students could cover running and operating costs. The initial machine purchase and facility costs would be the main investment. Machine costs are as follows:

1. Indian Manufacture
Kumar - Capacity 3 ton seed/24 hrs
- Oil expeller, filter press, dehuller (sunflower)
Baby Boiler, Switches, pulley etc and High Ware
Parts for One year.
C.I.F. Kampala US\$9602

Tiny Tech Indian Manufacture - Capacity 4 Tons/day.
(includes the same equipment as above = US\$8,100
C.I.F Mombasa

2. British Manufacture

Mini 40 - Capacity 40kg/hr
Same equipment as above, less Baby Boiler. \$28,100 at
present exchange rates, (Invoice for Kiboga Women's
Group).

3. Chinese Manufacture Capacity 3 - 5 ton/day. Including
expellers, filter and heating tanks \$10,850.

These would provide the basic configurations which would show
trainees the various problems they would encounter.
(attachments 9, 10 and 11).

In order to set up such a training center, a well experienced
expatriate trainer would need to be on-the-ground for 6 to 9
months after the center is completed. He could train a local
engineer who would continue training small groups of oilmill
operators (See attachment 12, Terms of Reference).

I. Monitoring And Evaluation can best be carried out if benchmark
data is available. In order to provide this data at least
three consultancies are required, using locally hired persons.

- 1) A Survey to determine the amount of edible oil was
produced by all oil plants in Uganda during the period
June 1993/May 1994 and June 1994/Dec, 1994. This survey
should be completed as soon as possible. To prepare
questionnaires and complete necessary field travel would
require 24 working days (4 weeks) at a cost of US\$.
35,000 per day plus US\$ 25,000 subsistence. Assume 27
days of travel status = US\$ 1.49 million. Plus
transport cost for bus & taxis US\$ 100,000 = US\$ 2.49
million.

For the follow-on periods beginning June 1994 and beyond
information may be obtained by mail response. However,
UOSPA should have someone carryout on-the-spot random
checks with both large and small oil millers to ensure
up-to-date accurate figures.

- 2) Benchmark data is needed which provides the best estimate
of present sunflower and soybean production in Uganda.
The survey should include interviews with Ministry of
Agriculture extension staff, oil millers, NGO's and any
other knowledgeable persons or organizations. This data
should be used to estimate area planted to these crops
and expected production.

This data can be useful to monitoring and evaluation
teams to make a determination of the program's progress.

- 3) There is an urgent need to prepare business and management profiles of a sample of small and medium scale oil mills. This would evaluate management capability and the capacity of this business to profitably borrow funds for working capital or capital expansion.
- 4) A write-up of the methodology of setting up and operating the revolving funds outlined above. This consultancy should be related to the business and management profiles. All the above studies should be funded and completed as soon as possible.

Local consultants are available to successfully complete these studies. The estimated cost for members 2-3 and 4 is US\$14 million.

Make a field survey of potential seed multipliers to determine how production costs can be reduced so seed sold to producers can be held down. At the existing levels of cost of seed multipliers farmers will not purchase seed unless its price is subsidized. This can be completed by the UOSPA manager.

Seed production data can be kept up-to-date through the warehouse receipts and distribution. Oil millers distribution records will provide statistics on areas where seeds are distributed. Yield data should be collected by extension agents and oil millers. The UOSPA project manager will follow the necessary monitoring of the progress. Targets should be set realistically so they are achievable.

An external evaluation, perhaps by a local consultant, should be carried out annually. This will help the project implementors keep the program on track.

PROJECTED COST OF THE VARIOUS COMPONENTS OF AN
INTEGRATED SEED MULTIPLICATION SCHEME

<u>COMPONENT</u>	<u>TOTAL FUND REQUIRED (MIL Shs.)</u>	<u>YEAR ONE</u>	<u>YEAR TWO</u>
1. Select and hire a UOSPA Project Manager/Seed Multiplication scheme Manager, plus driver.	44.0	21.0	23.0
2. Vehicle running and maintenance costs; plus field travel. (Vehicle transferred from CAAS to UOSPA)	24.0	12.0	12.0
3. Seed Multiplication	183.8	83.8	100.0
4. Oil Miller Loan Fund	500.0	165.0	335.0
5. Farmer Participatory Research and Extension.	527.2	257.3	269.9
6. Setup Seed Multiplication Revolving Fund.	50.0	25.0	25.0
7. Train Oil Millers.	23.4	23.4	-
8. Training Center: Building, Technical Assistance, Working Capital,	50 100 150	50.0 75.0 100.0	- 25 50
Sub-total	1,652.4	812.5	839.9
<u>STUDIES AND CONSULTANCIES</u> <u>(All Have First Priority)</u>			
a. Research on Oil Production,	2.5	2.5	-
b. Consultancies on area under seed production, oil mill management profile and set up revolving funds.	14.0	14.0	-
c. Consultancy: Spare Part Manufacture.	7.7	7.7	-
d. Monitoring and Evaluating	15.0	5.0	10.0
Sub-Total	39.2	29.2	10.0
Add: UCA Fund administration @ 3% (except AT(Uganda))	34.9	17.5	17.0
GRAND-TOTAL	1,726.5	859.2	867.0

ATTACHMENT - 1

INSTITUTIONAL AND PRIVATE FARMERS
SEED MULTIPLIERS FOR SEED MULTIPLICATION SCHEME
SECOND RAINS, 1994

NAME	LOCATION	TYPE OF SEED AND AREA PLANTED				
		SUNFLOWER		SOYBEANS		
		Acres	Hectares	Acres	Hectares	
<u>Private Farms</u>						
1.	Kitoka Sekajja	Masindi	-	-	40	16
2.	Ismail Lukumu	Kyatiri	25	10	25	10
3.	Mrs. Byakutaga	Kyatiri	-	-	25	10
4.	Karokora Zedekia	Masindi	40	16	20	8
5.	Mary Nyangoma	Kituka	5.5	2.2	43	17.2
6.	S. Katende	Masindi	19	7.6	10	4
7.	Green Bros Farm	Soroti	-	-	20	8
8.	Kakira Sugar Works	Kakira	125	50	25	10
9.	Lensacres	Mpigi	-	-	24	9.6
10.	Hoses Magenyi	Kyatiri	10	4	10	4
11.	Jean Wanyela	Kyatiri	10	4	10	4
	Sub total (Private Farms)		214.5	85.8	212	84.8
<u>Institutional Producers</u>						
12.	N.R.A Farm	Kiryandongo	73	29.2	50	20
13.	Serere Research Institute	Soroti	75	30	50	20
14.	Namulonge Research Institute	Namulonge	25	10	25	10
15.	Isimba Prison Farm	Hoima Rd.	25	10	10	4
	Sub total (Institutions)		198	79.2	135	54
	GRAND TOTAL		412.5	165	347	138.8

ATTACHMENT 2

EDIBLE OIL PROCESSING CASH FLOW ANALYSIS

CASH FLOW PROJECTIONS FOR AN OVERDRAFT TO FINANCE WORKING CAPITAL FOR AN OIL MILL WITH HALF TON PER DAY CAPACITY

ITEM/MONTH	1	2	3	4	5	6	7	8	9	10	11	12	total
'000 USH													
B/F		989	243	519	821	1,148	1,501	148	250	526	828	1,155	
REVENUES													
refined vegetable oil	1,050	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	24,150
soap stock	0	0	0	0	0	0	0	0	0	0	0	0	0
seed cake	0	319	319	319	319	319	319	319	319	319	319	319	3,504
overdraft	8,000						8,000						16,000
equity contributions	2,000												2,000
TOTAL RECIEPTS	11,050	3,407	2,681	2,938	3,240	3,567	11,920	2,567	2,668	2,944	3,248	3,574	53,782
DIRECT COSTS													
raw materials	8,000	989	0	0	0	0	9,501	148	0	0	0	0	18,639
labor and wages	60	60	60	60	60	60	60	60	60	60	60	60	720
packing materials	88	175	175	175	175	175	175	175	175	175	175	175	2,013
bags	3	3	3	3	3	3	3	3	3	3	3	3	
INDIRECT COSTS													
administrative costs	100	100	100	100	100	100	100	100	100	100	100	100	1,200
loading	65	8	0	0	0	0	77	1	0	0	0	0	151
loading cake	4	8	8	8	8	8	8	8	8	8	8	8	95
sales tax	105	210	210	210	210	210	210	210	210	210	210	210	2,415
electricity	75	75	75	75	75	75	75	75	75	75	75	75	900
depreciation	75	75	75	75	75	75	75	75	75	75	75	75	900
Interest (23%)	153	128	102	77	51	26	153	128	102	77	51	26	1,073
principle Repayment	1,333	1,333	1,333	1,333	1,333	1,333	1,333	1,333	1,333	1,333	1,333	1,333	16,000
TOTAL PAYMENTS	10,061	3,164	2,142	2,117	2,091	2,068	11,772	2,317	2,142	2,117	2,091	2,066	44,145
SURPLUS/DEFICIT	989	243	519	821	1,148	1,501	148	250	526	828	1,155	1,508	

EDIBLE OIL PROCESSING CASH FLOW ANALYSIS

CASH FLOW PROJECTIONS FOR AN OVERDRAFT TO FINANCE WORKING CAPITAL FOR AN OIL MILL WITH ONE TON PER DAY CAPACITY

ITEM/MONTH '000 USH	1	2	3	4	5	6	7	8	9	10	11	12	total
B/F		3,166	654	1,381	2,158	2,979	3,850	479	675	1,402	2,177	3,000	
REVENUES													
refined vegetable oil	2,100	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	48,300
soap stock	0	0	0	0	0	0	0	0	0	0	0	0	0
seed cake	0	637	637	637	637	637	637	637	637	637	637	637	7,007
overdraft	15,000						15,000						30,000
equity contributions	5,000												5,000
TOTAL RECEIPTS	22,100	8,003	5,491	6,218	8,993	7,816	23,687	5,316	5,512	6,239	7,014	7,837	112,226
DIRECT COSTS													
raw materials	15,000	3,166	0	0	0	0	18,850	479	0	0	0	0	37,495
labor and wages	150	150	150	150	150	150	150	150	150	150	150	150	1,800
packing materials	175	350	350	350	350	350	350	350	350	350	350	350	4,025
bags	7	7	7	7	7	7	7	7	7	7	7	7	
other production costs													
INDIRECT COSTS													
administrative costs	175	175	175	175	175	175	175	175	175	175	175	175	2,100
loading	121	28	0	0	0	0	152	4	0	0	0	0	303
loading cake	8	17	17	17	17	17	17	17	17	17	17	17	190
sales tax	210	420	420	420	420	420	420	420	420	420	420	420	4,830
electricity	150	150	150	150	150	150	150	150	150	150	150	150	1,800
depreciation	150	150	150	150	150	150	150	150	150	150	150	150	1,800
Interest (23%)	288	240	192	144	96	48	288	240	192	144	96	48	2,013
principle Repayment	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	30,000
TOTAL PAYMENTS	18,934	7,350	4,110	4,062	4,014	3,966	23,208	4,641	4,110	4,062	4,014	3,966	86,436
SURPLUS/DEFICIT	3,166	654	1,381	2,156	2,979	3,850	479	675	1,402	2,177	3,000	3,871	

OIL PROCESSING CASH FLOW ANALYSIS

CASH FLOW PROJECTIONS FOR AN OVERDRAFT TO FINANCE WORKING CAPITAL FOR AN OIL MILL WITH A 4MT CAPACITY
 ASSUMING THAT THE LOAN CAN BE RECIRCULATED TO BUY ADDITIONAL SEED FOR 4 MONTHS

EM/MONTH	1	2	3	4	5	6	7	8	9	10	11	12	total
'000 USH													
REVENUES													
fined vegetable oil	8,400	16,800	16,800	16,800	16,800	6,720	16,800	16,800	16,800	16,800	16,800	5,600	171,920
rap stock	0	0	0	0	0	0	0	0	0	0	0	0	0
ed cake	0	2,548	2,548	2,548	2,548	2,548	1,019	2,548	2,548	2,548	2,548	849	24,801
erdraft	30,000						30,000						60,000
quity contributions	10,000												10,000
TOTAL RECIEPTS	48,400	24,015	28,731	28,789	28,884	18,899	59,443	26,864	28,708	28,789	28,884	25,694	376,101
DIRECT COSTS													
w materials	35,000	4,687	9,383	9,441	9,538	0	41,624	7,518	9,360	9,441	0	0	135,968
bor and wages	450	450	450	450	450	180	450	450	450	450	450	150	4,830
icking materials	700	1,400	1,400	1,400	1,400	560	1,400	1,400	1,400	1,400	1,400	487	14,327
igs	27	27	27	27	27	27	11	27	27	27	27	9	
her production costs													
DIRECT COSTS													
ministrative costs	275	275	275	275	275	275	275	275	275	275	275	275	3,300
ading	283	38	78	78	77	0	338	81	78	78	0	0	1,099
ading cake	33	68	68	68	68	68	28	68	68	68	68	22	677
les tax	840	1,680	1,680	1,680	1,680	672	1,680	1,680	1,680	1,680	1,680	560	17,182
ectricity	250	250	250	250	250	100	250	250	250	250	250	83	2,683
preciation	300	300	300	300	300	300	300	300	300	300	300	300	3,600
erest (23%)	575	479	383	288	192	96	575	479	383	288	192	96	4,025
inciple Repayment	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	60,000
TOTAL PAYMENTS	43,733	14,632	19,290	19,253	19,253	7,276	51,927	17,503	19,287	19,253	9,640	6,982	247,988
NRPLUS/DEFICIT	4,667	9,383	9,441	9,536	9,631	11,624	7,516	9,360	9,441	9,536	19,245	18,732	

EDIBLE OIL PROCESSING CASH FLOW ANALYSIS

CASH FLOW PROJECTIONS FOR AN OVERDRAFT TO FINANCE WORKING CAPITAL FOR AN OIL MILL WITH 6 MT CAPACITY
 ASSUMING LOAN CAN BE TURNED OVER TO KEEP BUYING SEED FOR 4 MONTHS

ITEM/MONTH '000 USH	1	2	3	4	5	6	7	8	9	10	11	12	total
B/F		6,023	13,282	13,383	13,542	13,700	27,670	12,543	13,229	13,384	13,542	27,352	
REVENUES													
refined vegetable oil	12,600	25,200	25,200	25,200	25,200	25,200	25,200	25,200	25,200	25,200	25,200	25,200	289,800
soap stock	0	0	0	0	0	0	0	0	0	0	0	0	0
seed cake	0	3,822	3,822	3,822	3,822	3,822	3,822	3,822	3,822	3,822	3,822	3,822	42,042
overdraft	50,000						50,000						100,000
equity contributions	30,000												30,000
TOTAL RECIEPTS	92,600	35,045	42,304	42,405	42,564	42,722	108,692	41,585	42,251	42,408	42,584	56,374	629,492
DIRECT COSTS													
raw materials	72,500	6,023	13,282	13,383	13,542	0	77,670	12,543	13,229	13,384	0	0	235,558
labor and wages	700	700	700	700	700	700	700	700	700	700	700	700	8,400
packing materials	1,050	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100	24,150
bags	40	40	40	40	40	40	40	40	40	40	40	40	
INDIRECT COSTS													
administrative costs	450	450	450	450	450	450	450	450	450	450	450	450	5,400
loading	588	49	107	108	109	0	628	101	107	108	0	0	1,903
loading cake	50	99	99	99	99	99	99	99	99	99	99	99	1,142
sales tax	1,260	2,520	2,520	2,520	2,520	2,520	2,520	2,520	2,520	2,520	2,520	2,520	28,980
electricity	250	250	250	250	250	250	250	250	250	250	250	250	3,000
depreciation	400	400	400	400	400	400	400	400	400	400	400	400	4,800
interest (23%)	958	799	639	479	319	180	958	799	639	479	319	180	6,708
principle Repayment	8,333	8,333	8,333	8,333	8,333	8,333	8,333	8,333	8,333	8,333	8,333	8,333	100,000
TOTAL PAYMENTS	88,577	21,783	28,921	28,863	28,884	15,052	94,149	28,336	28,868	28,864	15,212	15,052	420,521
SURPLUS/DEFICIT	6,023	13,282	13,383	13,542	13,700	27,670	12,543	13,229	13,384	13,542	27,352	41,321	

ATTACHMENT - 6

ASSUMPTIONS ON COSTS AND RETURNS
BASED ON AN ACTUAL OPERATING MILL.

Small Scale Oil Mills Cash Flow

1. Three sizes: 6 - 4 and 1 ton of seed per day; all using sunflower seeds.
2. Assume a) 4 m.t. of sunflower = 1 m.t. of oil and 2.6 m.t. of cake
 - b) One m.t. of oil = 1086 liters
 - c) Oil price in local community = UShs. 1200/liter but if sold in Kampala requires transport and perhaps a lower price.
 - d) Oilseed cake at factory = UShs. 70/kg
3. Costs:
 - a) Seed delivered at the factory = UShs 200/kg
 - b) Packaging delivered at factory are
 - i) 20 liter Jerrycan = UShs. 2,000 ea
 - ii) 5 liter Jerrycan = 500 ea
 - iii) 1 liter Jerrycan = 300 eaassume all or most packed in 20 liter jerrycans.
 - c) Gunny bags for oilseed cake hold 80 kg ea cost UShs. 500 and can be recycled four times.
 - d) Labor for handling
 - i) Unloading sunflower seed = UShs. 100/50 Kg bags.
 - ii) Loading oilseed cake = UShs. 100/bag
 - e) Transport cost = UShs. 25/Kg
 - f) Sales tax on oil = UShs. 10% of value
 - g) Interest rate = UShs. 23%
 - h) Electricity cost = UShs. 250,000/month
 - i) Labor for factory = UShs. 700,000/month

j) Administration = UShs. 450,000/month

k) Depreciation = UShs. 400,000/month

(Assume a 10 year life for all machinery)

Note: Some of the costs e.g. factory labor; electricity cost; administration and depreciation will probably have to be apportioned on the basis of factory volume or expected throughput. We will make an educated guess on how to do this because there will not be a straight line reduction.

Implementation Timeline

1995

1996

Activities	1995												1996											
	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N
Recruitment of National Coordinator	■	■																						
Project Design and Planning	■	■																						
Training of Trainers for Existing Staff		■	■																					
Selection of Supervisors for New Districts				■	■																			
Orientation of District Supervisors					■	■																		
Design and Testing of Participatory Monitoring and Evaluation System in Lira/Apac						■	■																	
Selection of Cooperating Ministry Staff						■																		
Extension Staff Training (three seminars)						■	■	■																
Seed Distribution/Sales			■	■			■	■	■						■	■			■	■	■			
Farmer PAR Groups Form in New Districts							■	■	■	■	■	■			■	■	■	■	■	■	■	■	■	
Research Activities in New Districts								■	■	■	■	■			■	■	■	■	■	■	■	■	■	
Project Monitoring								■	■	■	■	■			■	■	■	■	■	■	■	■	■	
Development of Extension Materials		■	■				■	■	■						■	■			■	■				
District Oilseed Producer's Conferences																			■	■	■			
National Association Formation																					■	■		
Project Evaluation																						■	■	

A.T. (UGANDA) U-PRESS PROJECT
PROPOSED BUDGET FOR OILSEED RESEARCH & EXTENSION PR

USh '000		no. of Districts	BUDGET YEAR 1	BUDGET YEAR 2	TOTAL 2 YEARS
	Extension Coordinator		30,760	32,319	63,099
	salary and fringe		23,750	24,938	
	air fare		1,900	1,995	
	housing		5,130	5,387	
7801	Personnel - salaries and fringe benefits		20,235	38,603	59,138
	*** Accountant @ \$400/mo X 12		2,280	4,788	
	Driver @ \$300/mo X 12 mo		3,420	3,591	
	*** Agricultural officers @ \$425/mo X 12mo	6	14,535	30,524	
7818	Technical Assistance		5,700	5,700	11,400
	(Strategy Development and Evaluation)				
	daily rate @ \$200/day X 14 days		2,660	2,660	
	airfare		2,090	2,090	
	Kampala 4 days @ \$150		570	570	
	upcountry 10 days @ \$40		380	380	
7803	Travel - Field Staff travel allowances		34,414	69,608	101,221
	Director Travel 15 nights X \$40		570	599	
	Coordinator 75 nights X \$40		2,850	2,993	
	Driver 75 nights X \$25		1,761	1,870	
	*** Agricultural officers @ 50 nights X \$25	6	3,563	7,461	
	*** per diem gov't staff 50 nights X \$12 X 5	6	25,650	53,865	
7840	Training		14,535	18,516	33,051
	seminars	6	13,110	18,516	
	training materials	6	1,425	0	
7811	Transportation, Equip. and O&M		77,540	47,313	124,853
	4wd vehicle (Pajero)	1	26,600	0	
	motorcycles @ 3,500,000/=	6	21,000	0	
	*** fuel for motorcycles & vehicle	6	18,399	25,137	
	*** maintenance @ 15%		5,565	7,497	
	*** insurance @ 15%		5,565	7,497	
	*** bicycle allowances @ 19,000/mo/ext agent	6	3,420	7,182	
7806	Demonstration equipment and expenses	6	2,850	2,993	5,843
7805	Communications		1,900	3,491	5,391
	Extension materials & publicity		1,425	2,993	4,418
	Post and telecommunications		475	499	
7808	Office equipment, supplies and services		20,425	1,995	22,420
	supplies and services		1,900	1,995	
	furniture & household equip (Coordinator)		2,375	0	
	radio equipment		6,650	0	
	generator for extension program		2,350	0	
	computer & printer x2		6,650	0	
7808	Professional Fees (Audit)		1,425	1,496	2,921
7810	Miscellaneous		594	249	843
	*** bank charges		119	249	
	recruitment costs		475	0	
	Total Direct Costs		209,190	219,451	428,641
	Total Indirect Costs @ 23%		48,114	50,474	98,587
	TOTAL COSTS		257,304	269,925	527,228

*** Denotes items charged for only 6 months in Year 1.

Braintree Exports Ltd.18 THIRLMERE CLOSE
WHITECOURT
BRAINTREE, ESSEX
CM7 8UL, ENGLAND

Tel. (0376) 45472 & 553170 PAGE 2 of 2

Fax. 0376 552512

Date 8.JUNE.92

PRO-FORMA / INVOICE
AIRPRU8/6/1

INVOICE TO :

DELIVERY ADDRESS :

CAAS PROJECT,
P.O. Box 2215
KAMPALA.
UGANDA

S A M E

Item	Description	Quantity	Unit	Amount
	To supply:-			<u>POUNDS STERLING</u>
	SUNFLOWER -OIL MILL EQUIP.(CAP. MINI 40 MILL:40 KGS/HR INPUT).			
1 X	NUTCRACKER-DECORTICATOR FOR SUNFLOWERSEED ELECTRICAL POWERED CAP.200 KG/HR. COMPLETE WITH THROWER,KNIF,RING AND SIEVES			1010.00
	SEAW. CASE: 106 X 76 X 57 cm GROSS WEIGHT: 135 KG./NET 95 KG			65.00
1 X	ROLLERMILL-FLATTENER KIT-UNATA 8003 HAND POWERED CAP.60 KG/HOUR SUNFLOWER/PEANUTS DIMENSIONS CASE: 94 X 72 X 76 cm GROSS WEIGHT 150 KG./NET 115KG.			1075.00
				105.00
1 X	WINNOWER FOR SUNFLOWERSEED ELECTRICAL POWERED CAP.200 KG/HR SEAWORTHY CASE 65 X 54 X 110 cm GROSS WEIGHT 78 KG ./NET 56 KG.			675.00
				65.00
1 X	KETTLES FOR SEED-HEATING DIAMETER 550 mm/4 mm THICKNESS/ 100 LITRES SEAWORTHY CASE 67 X 100 X 76 cm . 110 KG.			421.00
				80.00
	TOTAL F.O.B.AIRPORT			9,986.00
	AIRFREIGHT TO ENTEBBE			1,505.00
	INSURANCE			100.00
	<u>TOTAL C.I.F. ENTEBBE</u>			<u>11,591.00</u>
VALIDITY	END OF 1992 .			
DELIVERY	NORMALLY EX STOCK/MAX 12 Weeks.			
ORIGIN	BELGIUM & UK			
PAYMENT	100% ON ORDER/LETTER OF CREDIT.			

Braintree Exports Ltd.

18 THIRLMERE CLOSE
WHITECOURT
BRAINTREE, ESSEX
CM7 8UL ENGLAND

Tel. (0376) 45472 & 553170 PAGE 1 of 2

Fax. 0376 552512

Date 8.JUNE.92
PRO-FORMA / INVOICE
A/PNU8/6/1

INVOICE TO :

DELIVERY ADDRESS :

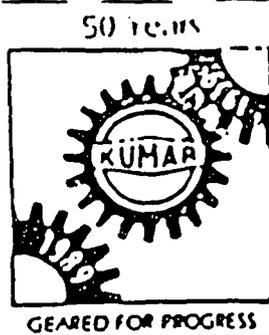
CAAS PROJECT,
P.O. Box 2215
KAMPALA
UGANDA

S A M E

Item	Description	Quantity	Unit	Amount
			<u>POUNDS</u>	<u>STERLING</u>
1 X	To supply:- MINI 40 SCREW PRESS ELECTRICALLY DRIVEN			4,600.00
1 X	ELECTRIC MOTOR AND STARTER			338.00
1 X	VEE ROPE DRIVE (3 BELTS)			77.00
	SPARES COMPRISING:-			
1 X	CHOKE RING			60.00
1 X	SET (12) BARREL RINGS			302.00
1 X	PHOSPHOR BRONZE THRUST WASHER			28.00
1 X	PHOSPHOR BRONZE BUSH			58.00
1 X	WORMSHAFT			438.00
1 X	VIBRATORY FEEDER			589.00
	TOTAL PACKED AND DELIVERED F.O.B UK PORT			£ 6,490.00

ORIGIN UK
MANUFACTURED BY DE SMET ROSEDOWNS LTD,
CANNON STREET,
HULL,
HU2 0AD, HUMBERSIDE

Manufactures & Exporters of
Oil Expellers and Spares, Copra Cutter,
Steam Boilers, Agricultural Implements,
Rice Mill Machinery, Machine and Hand Tools,
Complete Oil Mill - Cattle Feed - Soap Plants,
Oil Refineries etc.



KUMAR METAL INDUSTRIES

101, KANAD BHAVAN, 30TH ROAD, OPP. GAITY-GALAXY CINE
BAHIDIA (WEST), BOMBAY 400 050 INDIA
TEL : 644 1673, 644 1674, 644 1667, 642 7982
FAX (91-22) 6428136 TELEX : 011-75358 KUMAR-IN

M/s.	No. KMI / U2/P200/94.
Kasese, Uganda.	Date : 6.4.94.

- | | |
|---|--|
| 1. Shipment to : KAMPALA | 2. Approximate delivery time : WITHIN 90/120 DA |
| 3. Insurance : | 4. Payment : CANARA BANK, P.O. BOX - 8 |
| 5. Importers Bank :
Name & Address : | By irrevocable Letter of Credit Through : BOMBI |
| | 6. Part Shipment to be allowed : Yes / No |

Sl. No.	Qty.	Part No.	PARTICULARS	Sig L / Ind Rs. / U s. \$	
				Rate per	Total
			VEG. OIL MILL MACHINERY FOR COTTON SEED /GROUNDNUT /SINSIM /SUNFLOWER CAPACITY 3 TONS/24HRS.		
	1 Unit		Kumar's Simplex Oil Expeller capacity 3 tons/24 hrs. complete with horizontal mounted cooker and all necessary accessories including 7.5 HP Motor	3960	3960
	1 Unit		Filter press 12"x12"x12 plates complete with plunger pump and all necessary accessories including motor.	840	840
	1 Unit		Kumar's Huller (for sunflower) aspiration system and all necessary accessories including 2 HP Ele. Motor capacity 500 Kgs/hr.	1440	1440
	1 Unit		Groundnut Decorticator complete with V Belts 200/250 Kgs/hr.	378	378

For **KUMAR METAL INDUSTRIES**

Business finalised by

Signature & Stamp of buyers

KUMAR METAL INDUSTRIES

Ref. No. _____

Date _____

INDENT/PROFORMA INVOICE/QUOTATIONS

Continuation Sheet No. _____

S. No.	Qty.	Part No.	PARTICULARS	Rate per	Total
	1 Unit		Baby Boiler 50kgs/hr. with all necessary accessories including manual feed pump.	720	720
	1 Lot.		Complete switch and starters for 7.5 HP, 2 HP for 1 HP V Belts and Pipe for the plant,	180	180
	1 Lot.		Wear & Tear spare for 1 year.	612	612
TOTAL F.O.B. BOMBAY US\$					8130
EST. FREIGHT UPTO KAMPALA US\$					1850
TOTAL C. & F. KAMPALA US\$					9980

For Kumar Metal Industries

[Handwritten Signature]

Business finalised by _____

Signature & Stamp of buyers _____

[Handwritten mark]

TINYTECH PLANTS

(Committed to Human Technology)

TAGORE ROAD, RAJKOT-360 002, INDIA

Phone : 91-281-48466 (O)
 Phone : 91-281-51086 (R)
 Fax : 91-281-40532 (O)
 Fax : 91-281-52231 (R)
 Tel. No. 105 245 TINYTECH

To, VICTOR AMANN,
 USAID CAAS PROJECT,
 ACCI/RONCO,
 P.O. BOX 7007, KAMPALA, UGANDA.

PROFORMA INVOICE
 NO.: 545/8373/50/1

DATE: 19-4-94

Sr. No.	Description of Goods	Qty.	Rate	Amount
			US \$	US \$
	TINY OIL MILL MACHINERY (CRUSHING CAPACITY 2 / 3 / 5 TONNES/DAY)			
1	Oil Expeller with (i) oil bath gear housing (ii) Quick effortless cage opening device (iii) Cake thickness changing while running device, complete with standard accessories. Chamber Size 22"x3.5" crushing capacity 80 to 100 kg/hr. Chamber Size 16"x4" crushing capacity 80 to 100 kg/hr. Chamber Size 24"x4" crushing capacity 95 to 120 kg/hr.	1	1500	1500/-
2	Long horizontal/Round vertical cooking kettle complete with steam jacketting, conveyor, automatic feeding device, pulley etc.	1	400	400/-
3	Filter Press complete with Filter pump, cocks, oil collection tray, filter clothes, pressure gauge etc. Size 12" x 12" - 12 plates Filtration capacity 100 lit/hr Size 16" x 16" - 12 plates Filtration capacity 200 lit/hr.	1	650	650/-
4	Husk fired Baby boiler working pressure 50 psi. test pressure 150 psi. evaporation 60 kg/hr complete with water level set, pressure gauge, safety valve, C.I. grate, feed pump assembly etc.	1	700	700/-
5	Groundnut Decorticator capacity 300 kg/hr complete with oscillating shaker screen pulleys etc.	-	-	-
	Sunflower decorticator/Palm nut cracker capacity 300 kg/hr with 2HP motor.	1	500	500/-
7	Neutralizer capacity 150/300 lit. with electric motor and reduction gear box.	-	-	-
8	Accessories such as accessories belting, pipe lines, valves, cocks, oil tank, chimney etc.	1	350	350/-
9	Essential spare parts kit.	1	650	650/-
10	Diesel oil engine 10 H.P. ISI.	-	-	-
11	Electric Motor 7.5 H.P. with starter. 960 R.P.M.	1	500	500/-
				5250/-

Approx. gross wt. kg.

2200 KG. 3000 Kg

Approx. volume cu. mt.

5 CU.MT.
6 cu. mt.

TOTAL

\$5250/-

Note : Suitable for Sesame, Sunflower, Palm Kernel, Groundnut, Coconut, Cottonseed, Castorseed etc.

C.I.F. MUMBAI

DELIVERY within 1/200 weeks from the date of receipt of full payment at our A/c No. 11471 at Corporation Bank, Dhabar Road, Rajkot - 360 002 India.

For. TINYTECH PLANTS

(Signature)