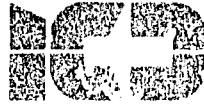


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Industry Council for Development

PRIVATE SEED INDUSTRY DEVELOPMENT IN

U G A N D A

REPORT OF THE ICD MISSION

OCTOBER 17 TO NOVEMBER 5, 1987

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PRIVATE SEED INDUSTRY DEVELOPMENT IN UGANDA  
REPORT OF THE ICD MISSION

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## ABBREVIATIONS AND ACRONYMS

ADB	African Development Bank
ADO	Agricultural Development Officer
AFBYAN	African Bean Yield Trials
BAT	British American Tobacco Company
CA	Commissioner of Agriculture
CIAT	International Center for Tropical Agriculture
CMB	Coffee Marketing Board
COU	Church of Uganda
DAO	District Agricultural Officer
DFI	District Farm Institute
DM	Deutsche Marks
EEC	European Economic Community
FAO	Food and Agriculture Organization
FM	Farm Manager
GDP	Gross Domestic Product
GM	General Manager
GMD	General Managing Director
GTZ	German Federal Republic Development Agency
Ha.	Hectare
ICD	Industry Council for Development
IITA	International Institute for Tropical Agriculture
IMF	International Monetary Fund
Km.	Kilometer
LMB	Lint Marketing Board
MA	Minister of Agriculture
MFAD	Manpower for Agricultural Development Project (USAID)
NARO	National Agricultural Research Organization
NRA	National Resistance Army
NRM	National Resistance Movement
NSA	National Seeds Administration
OGL	Open General Licensing
PM	Project Manager
PMB	Produce Marketing Board
PS	Permanent Secretary
UCA	Uganda Cooperative Alliance
UCB	Uganda Commercial Bank
UCCU	Uganda Central Cooperative Union
UK	United Kingdom
UNDP	United Nations Development Programme
USAID	U.S. Agency for International Development
USC	Uganda Seed Company
USP	Uganda Seed Project
VTC	Variety Testing Centers

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## EXECUTIVE SUMMARY

### I. Introduction and Present Situation

Uganda is endowed with fertile soils and a reliable rainfall which, although variable in intensity and distribution, is largely adequate (over 1000 mm per year) to support higher yielding agriculture.

Because most of Uganda's territory is high plateau, temperatures are moderate and a variety of crops can be planted.

Several cropping patterns exist in the country, and will be discussed below.

In the Soroti region, cotton was the most important cash crop, although acreage has decreased considerably in recent years. With light soils and farms averaging 4 Ha. in size, food crops such as finger millets, sweet potatoes, cassava, cowpeas, groundnuts, sorghum and sesame are planted during a prolonged dry system following heavy rains because of better harvest possibilities.

In the higher elevations, arabica coffee and tea plantations prevail. In the fertile crescent around Lake Victoria, bananas are the main food crop and robusta coffee the main export crop. Interspersed within these crops small areas of groundnuts, beans, maize, brewing sorghums and sweet potatoes complement the food supply. In recent years, maize has been steadily increasing in acreage, replacing substantial portions of that once planted in bananas.

In central Uganda, away from the lake area, one finds a banana, millet and cotton cropping system, complemented by other crops: sorghum, groundnuts, cowpeas and tobacco.

In the northern region around Lira, Gulu and Kitgum, the growing of cash crops such as tobacco, cotton and sunflower, and food crops such as finger millets, sorghum and cassava are prevalent. Rainfall is lower, and soils are fertile or monomodal.

The region west of the Nile receives lower precipitation and therefore produces mostly cassava and millets.

Mountainous systems with high, reliable rainfall are found in the Kigezi district around Kabale. Sorghum is the main crop and finger millets, beans, and potatoes are also found. In the Rwenzori districts of Kasese and Kabarole, banana, cassava, yams, finger millets, maize and beans are

the major food crops, and arabica coffee and tea the cash crops. The Mount Elgon districts around Mbale and Kapchorwa produce bananas, maize (which is growing in importance), finger millets, beans, sweet potatoes and yams as food crops. Arabica coffee and tea are grown for cash.

A pastoral system is found in Karamoja and Ankola in the semi-arid north and northeast of the country, which has a long dry season. Local inhabitants raise cattle which they trade for other food, although they grow small amounts of food crops.

Most of the country's grassland areas, which are extensive, are covered with native wild elephant grass (Penniselum purpureum in the more humid areas and Hyparrhenia rufa in the dryer sections). Livestock production in the country remains important, but armed conflict in Uganda has resulted in a certain amount of decimation of the once vast herds.

Farm sizes range, on average, from 1.5 to 5 Ha. per household. Ownership rights remain uncertain, as a Land Reform Decree has established that freehold land is Government property. Borders between traditional tribal land and freehold land have been blurred by population growth and the advance of farmers onto former freehold land, without clear titles. This has resulted in significant confusion.

At the present time, coffee exports account for over 30% of foreign currency earned by the country. Cotton acreages have decreased considerably and many processing facilities are idle or working at low levels of production.

A strong and well organized system of service cooperatives has existed in Uganda for almost 50 years. There are 33 District Cooperative Unions, each comprised of primary cooperative societies, which cover most of the farmers of Uganda. The Masaka Cooperative Union claims one million affiliates. The District Unions are served by six National Cooperative Central Unions covering: supply of agricultural and industrial materials to members, transportation, wholesale supply, savings and credit, a cooperative bank, and insurance. The system is the largest and best established cooperative system in sub-Saharan Africa.

Agricultural research and extension are being substantially improved. USAID is providing important support in these areas.

Agricultural credit is available, but on a limited basis. Agricultural inputs that require foreign exchange are in short supply.

The highway system of Uganda, once one of the most extensive in East Africa, has deteriorated considerably, although the main roads leading out of Kampala are adequate. There is a pronounced shortage of road-worthy trucks.

The present economic situation of the country remains bleak. Inflation is high - around 200% per year. The official exchange rate is Ugandan Shillings 60 to one U.S. dollar, but because of scarcity of foreign currency, the price of the U.S. dollar in the black market was 200 Uganda Shillings in October 1987. The overvalued currency favors short term trading activities and discourages exports. Government intervention in the economy is pervasive. It imposes price controls, buys agricultural products, operates production facilities, controls exports, etc. In recent years, government budget deficits which stem from the narrow economic base have contributed to the state of overall economic deterioration.

The government has initiated positive reform in the areas of fiscal policy, production, foreign exchange, exports and imports. If this process continues, Uganda may begin to return to the position of economic leadership which the country held in East Africa in the early 1960s.

## II. Present Status and Future of a Seed Industry in Uganda

Government officials, farmers, and development agency representatives recognize that adequate supply of seeds of high yielding varieties (HYVs) is a key element in the agricultural development of Uganda.

In the year immediately following independence, the agricultural research programs of the Ministry of Agriculture and Makerere University were instrumental in raising the yields of maize, sorghum, beans, groundnuts and cotton, as these crops were gradually diffused through the farm community. Shortly afterward, however, seed of

different varieties became mixed and farmers were without a reliable supply from a well-organized seed production system until about 1984. At the Kawanda, Namulonge and Serere Agricultural Experiment Stations new breeder seed stocks are being compiled by reselecting farmer seed stock to conform as closely as possible to the original varietal types. Some foundation seed has recently been produced, establishing a base from which to support certified seed production during the next 3-4 years.

These efforts are being reinforced with the introduction and testing of new varieties of maize, sorghum, beans, groundnuts, soya beans and millets. The testing activities are being conducted at the seven operational variety testing centers.

USAID has supported several institution-building agricultural research programs in recent years. Other support comes mostly from international agricultural research centers such as CIAT and CIMMYT.

The Karamoja Seed Project was established several years ago by the Church of Uganda in northeastern Uganda, and was designed to be essentially self-supporting.

The Masaka Seed Project has been planned and funded by the West German Aid Agency G.T.Z. It will concentrate on production of seeds of leguminous crops (beans, soya beans and groundnuts), and should begin operations in the coming months.

No private seed companies are operating in the country or planning to invest in the seed industry at present.

In 1986, the supply of high quality seed of improved varieties from the Uganda Seed Project was 392 MT for maize and 17.2 MT for sorghum. The Karamoja Seed Project produced 326 MT of all seeds (groundnuts, sunflower, maize, sorghum and millets) in 1986. The Masaka Seed Project aims to produce 1000 MT annually of leguminous grain seeds during its initial phase (10% of the seed demand in the region where it operates), and 3500 MT annually (30% of projected demand in the same region) during the second phase (within 10 years).

Against this supply background, total annual seed use in Uganda is estimated as follows:

Maize	5,400	MT
Sorghum	1,120	MT
Finger millet	2,460	MT
Wheat	440	MT
Rice	1,700	MT
Groundnuts	14,980	MT
Beans	24,320	MT
Soya beans	440	MT
Sesame	675	MT

Without taking into account other species, total seed utilization is over 150,000 MT per year. The initial market estimated by the ICD mission is 15,445 MT with a value of Ug. Sh. 795,839,000 at the official exchange rate (Ug. Sh. 60 per one U.S. dollar).

The most prevalent maize varieties are Kawanda Composites A and B. The first, KWCA, was released in 1971 and is widely grown in the country, but is highly susceptible to streak virus. Local research is not likely to lead to successful, disease-resistant hybrid maize in the short to medium term. However, maize hybrids from Kenya are widely used and are preferred by many farmers, especially in the north.

Bean varieties were developed through research initiated in the 1960s. One variety, K-20, was recovered and breeder seed for it is being produced today. Other varieties are not available for commercial production at this time.

Millet and sorghum varieties originating at the Serere station are available for seed production, especially Serena and Seredo sorghums, Serere I, Engenyi and Gulu E finger millets, and Serere Composite I and II pearl millets.

Soya bean varieties developed at Makerere University are being propagated at the breeder and foundation seed levels. These include Congo 72, Cabanyolo, S-38 and Bukalasa varieties.

The substantial seed production of high yielding groundnut varieties identified in the 1970s has now come to a standstill. Red Beauty seed has been recovered and may become available in the near future.

At present, the Ministry of Agriculture is conducting seed testing programs. No participation of private hybrids

or varieties was detected in these trials. Varieties are still mainly introduced by public research centers, the tri-country research project (Tanzania, Kenya, Uganda) and the international research centers (Intsormil, CIAT, CIMMYT, ICRISAT and IITA).

It is unlikely at the present pace of local public research that new varieties will soon become available. Increasing the introduction of varieties and hybrids from foreign sources would significantly improve the prospect of developing new products for farmers in the near future.

Criteria for the introduction, testing and registration of varieties which would facilitate the participation of the private sector are presented in this report.

New seed legislation is needed not only to provide the "rules of the game" for the development of the Uganda seed industry, but also to establish the components of an integrated national seed system. Seed legislation should be promotional rather than regulatory in philosophy. It is proposed that new seed legislation encompass the reorganization of public administrative services, the encouragement of private sector participation in research, production and marketing of seeds, as well as incentives and regulations concerning seed introduction, testing, registration, varietal protection, seed quality control, certification, marketing and distribution, import and export, and phytosanitary and plant quarantine regulations.

Seed marketing and distribution in Uganda is presently relegated to regional agricultural cooperatives working in association with the Union of Central Coops of Uganda (UCCU). They market seed produced by the Uganda Seed Project, at a theoretical distribution mark-up of 5%, but the real mark-up is closer to 30%. Imported vegetable seeds (from the U.S.) and hybrid maize (from Kenya) made by UCCU, with USAID funding, is distributed by UCCU to the District Cooperatives.

Unlicensed traders who buy, sell, and import hybrid maize seed from Kenya are important in the marketing context, and their contributions to this activity are substantial, although hard to quantify.

Because the Uganda Seed Project operates as a unit of the Ministry of Agriculture, its prices do not reflect actual costs of production and distribution. Pricing

policies, therefore, will be a key issue in the development of a private seed industry. A pricing system with minimum regulation is a basic requirement for the development of a strong seed industry.

Prices of agricultural commodities are set by the Produce Marketing Board. Prices have traditionally been kept low, which evokes complaints from producers. The government has recently adjusted prices of food crops. In the face of accelerated inflation, however, there is a tendency for real farm income to lag behind as inflation erodes the value of the currency, provoking disincentives to produce.

### III. Organization and Development of a National Seed Industry and National Seed System

A national seed industry, capable of distributing the recently increased foundation seed production attained through the Uganda Seed Project, is urgently needed. The present system is not geared toward developing a true production/marketing system for commercial seed of the magnitude required by Uganda. This is better accomplished through the private sector.

It is recommended that the Uganda Seed Project be transformed into a National Seed Administration, as a unit of the Ministry of Agriculture, with responsibility for foundation seed production, program planning and administration, quality control and certification.

The mission's seed production and marketing projections indicate that the seed market in Uganda may be too small for more than one company, at least at the outset, to achieve sufficient profit margins. Therefore, it is proposed that a "Uganda Seed Company" be established as a private company. The recommended ratio of private (domestic and foreign) to public investment in the venture would be 4:1. The system of cooperatives may participate in the shareholding reserved from the government side.

Proposed capital, administrative and operational budgets have been elaborated for the company based on the recommended administrative structure and production/marketing goals which experience indicates are feasible. Assuming a normal 20% annual seed replacement rate in self-pollinated species and open-pollinated varieties of cross-pollinated species (maize), and the successful

introduction of hybrids, the mission estimates that one-half of potential may be attained within the first 8 to 9 years of the company's operation. This would in itself be a sizable goal for the first stage.

The estimated cash flow model and sensitivity analysis indicate, under certain assumptions, that a positive flow can be achieved in the second year of operation.

An investment outline is also presented.

Seed distribution could be facilitated by the cooperative system, but a complementary network of dealers is required to enhance the adoption of seeds of improved varieties by farmers. Linkages would be established between the Uganda Seed Company (USC) and the Uganda Seed Project or its successor. Facilities at the Masindi Seed plant and at the Kisindi Farm could be leased by the Uganda Seed Company. It is envisioned that the USC could be in a position to operate its own plant(s) and warehouses within two years of beginning operations. Other linkages would be established with the Karamoja and Masaka Seed Projects in production and distribution.

The company will introduce hybrid sorghum, maize, sunflower and millets, and produce seeds of finger millets, wheat, barley, beans, groundnuts, soya beans, sunflower, sesame, some vegetables, forage grasses and Irish potatoes.

Special linkages will have to be developed with the Ministry of Agriculture to plan and execute Ministry of Agriculture policies without compromising the ability of the USC Board to make its own decisions. Special emphasis will be placed on strong liaison and cooperation with both the research and extension activities of the Ministry of Agriculture. The connection to the cooperative system will basically be in the areas of seed distribution and farmer education.

The mission believes that the establishment of the USC will require loan financing for the acquisition of seed plant equipment, erection of buildings and purchase of agricultural machinery and vehicles. A loan in Uganda Shillings would support the production of seed in the country and inventory build-up in the first several years of operation. A grant might be considered to cover the foreign exchange component of the cost of an expatriate management team during the first three years of the company's operation. The foreign exchange requirements of the company will have to be guaranteed by the Government of Uganda.



#### IV. Summary Recommendations

The following recommendations are included in various forms and extensions in the body of this report. For the purpose of order, conciseness and visibility, they are summarized in this section without resorting to detailed repetition of their justification.

1. Establish as the core of Seeds Promotion Policy the creation, development and support of a Private Seed Industry in Uganda.
2. Private investors from both Uganda and foreign countries should be encouraged and invited to participate in the establishment of one or more seed companies in the country. The ICD mission feels at present that the market may be sufficiently large to support one company as a full service seed company.
3. The structure of shareholding in a proposed seed company should be 70% private, including both Ugandan and foreign investors, and 30% Government of Uganda representation.
4. The Government of Uganda participation proposed will be that of a financial entity, most likely the Development Finance Corporation of Uganda (DFCU), Uganda Development Corporation (UDC), a Government of Uganda holding company, or the Bank of Uganda.
5. The Board of Directors of the company would include representatives of government; it is suggested that the Ministry of Agriculture and Uganda Central Cooperatives Union be represented on the Board.
6. Because of the current situation of the Cooperative System, it is recommended that the Cooperatives initially not be shareholders of the company. The Cooperative System will be critical marketing outlets.
7. USAID support to the Cooperatives should be independent of the Seed Company development.
8. It is suggested that USAID supply the following support to the development of a private seed company:
  - a) A US \$1.0 million dollar long term loan (20 years payment time, five year grace period, 2-3%

interest) to a seed company formed in Uganda under its auspices, as structured in the present report, plus a loan of US \$1.0 million in Uganda Shillings equivalent for leverage in obtaining credit in local currency for raising working capital loans.

- b) Alternatively, USAID could offer a grant for the first amount to the local seed company. In either case the loan would be used to purchase equipment, and for payment of salaries and honoraries in dollars.
9. The seed company would initially have a three member staff of expatriates to take care of the management. The group could be scaled up to four as the action becomes more intensive after the first year. The expatriates would be expected to stay for a period of at least three years and no more than five, training local assistants to take over their positions. It might be necessary to retain one of the expatriates after this period.
10. Investment in equipment in the seed plant is established for a totally new plant, assuming that the present Masindi facilities will be retained by GOU for production of foundation seed. The Uganda Seed Company, proposed name for the enterprise, could start by leasing plant facilities or having seed processed by the Uganda Seed Project as a custom operator. After two years it would begin operating its own plant. The location is not yet established, as it would require detailed study.
11. Clearly, the GOU would have to establish the minimum appropriate conditions for any of the above to take place. The signals sent by GOU should be very clear, and should include a new Seed Law, Investment legislation, offer of land lease, and the possibility of freedom of price fixation. Above all, it should inform the potential investors of its policy and intentions relative to the investors, the seed company itself, and the treatment of the investment and its profits.
12. USAID could host a Seed Seminar to be conducted over a two day period to discuss the potential implications and details of our proposals, and recommend more

detailed blueprints for action. In this seminar, potential investors could be invited to attend, together with a group of experienced seminar conductors from ICD and USAID, the African Development Bank, Cooperatives, GOU officials and farmer representatives.

## II. INTRODUCTION

### A. Background

The Ministry of Agriculture of Uganda requested USAID/Kampala to develop a feasibility study on the possibility of structuring a private seed company in Uganda. Such a company would undertake the task of supplying the majority of seed needs of the country in the area of major food crops, such as maize, beans, soybeans, groundnuts, sorghum, pearl and finger millet, sunflower and, eventually, forage seeds and some vegetable seeds.

USAID/Kampala contracted with Industry Council for Development (ICD) to field a mission in Uganda and develop such a study. ICD is a non-commercial development organization which assists economic and social advancement in developing countries according to their national goals and at the request of their governments. ICD members are corporations from fifteen countries who support the objectives and principles of ICD and who agree to make expertise available to Council activities as a contribution to the development process.

These activities are designed to provide practical assistance to national development programs. They include policy advice, managerial and technical expertise, training, enterprise development and investment promotion. ICD's development service, which is based on this expertise, generally works in cooperation with multilateral, bilateral and/or private development organizations.

The ICD team<sup>1</sup> arrived in Kampala on October 17-18, 1987, and immediately went to work, establishing contact, interviewing persons in the public and private sectors, reviewing pertinent documentation, and traveling for 1300 kilometers around the western part of the country.

The terms of reference for the ICD mission are listed below:

#### Specific Terms

The feasibility seed team will have the following terms of reference:

1. Review literature available on seed production in Uganda.

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<sup>1</sup> The ICD mission was composed of Dr. Alexander Grobman, ICD Senior Associate and mission leader, Mr. Michael Budden and Dr. George Johnston.

2. Visit both current and planned production sites.
3. Review and assess the draft, "The Seed and Other Planting Materials Act," and provide recommendations on its enactment.
4. Review policy and other matters related to the establishment of a viable seed organization or company in Uganda, including possible public, private and cooperative participation and involvement.
5. Articulate the government's role in promoting and facilitating private sector seed production, including the establishment of a national seed laboratory to ensure quality control.
6. Develop economic and financial projections including proposed share arrangements (private, cooperatives and public) for the seed company.
7. Provide details and consideration of a joint venture/management arrangement with an international seed production firm.
8. Prepare the draft memorandum and articles of association of the proposed Uganda Seed Company, and define its organizational structure.
9. Indicate specific financial commitments, to the extent possible, for the establishment of the Uganda Seed Company in detailed discussions with each of the possible donors, private sector businesses and cooperatives.

B. Climate and Agro-Ecology

1. General

The rainfall of Uganda is unusually high for a landlocked country far from the sea. More than half the land area has a reliable rainfall of over 760mm yearly, and for most areas the prospect of 500mm is good. Lake Victoria and numerous other lakes and swamps contribute to a generally high level of humidity and rainfall. Western Uganda also receives moist air from the Congo Basin and the Southern Atlantic. As might be expected in a country situated between latitudes 1°S and 4°N, the climate is basically equatorial, although strongly modified by altitude.

Population distribution has been largely determined by rainfall, soil type and altitude. In a predominantly

agricultural country the people have clearly made effective empirical judgments on land potential. The bulk of the population are in areas of around 1140mm annual rainfall. These areas are in the "fertile crescent," a 360 Km. arc around Lake Victoria from Rakai to Tororo; the interior plateau from Tororo to Gulu; the Mount Elgon area in the east; the Southwest Highlands and the West Nile Plateau. There is a low population density in the Karamoja region bordering on the Kenya frontier; the Western Rift Valley near Lakes Albert, George and Edward; and the grassland areas of Ankole, in the southwest. Of course, the tendency of the population to focus on the Lake Victoria region and fringes of Mt. Elgon is accentuated by the developed communications network and the presence of the four major towns of Uganda. Population density is demonstrated by maps at Figure II.1 and Figure II.2.

## 2. Temperatures

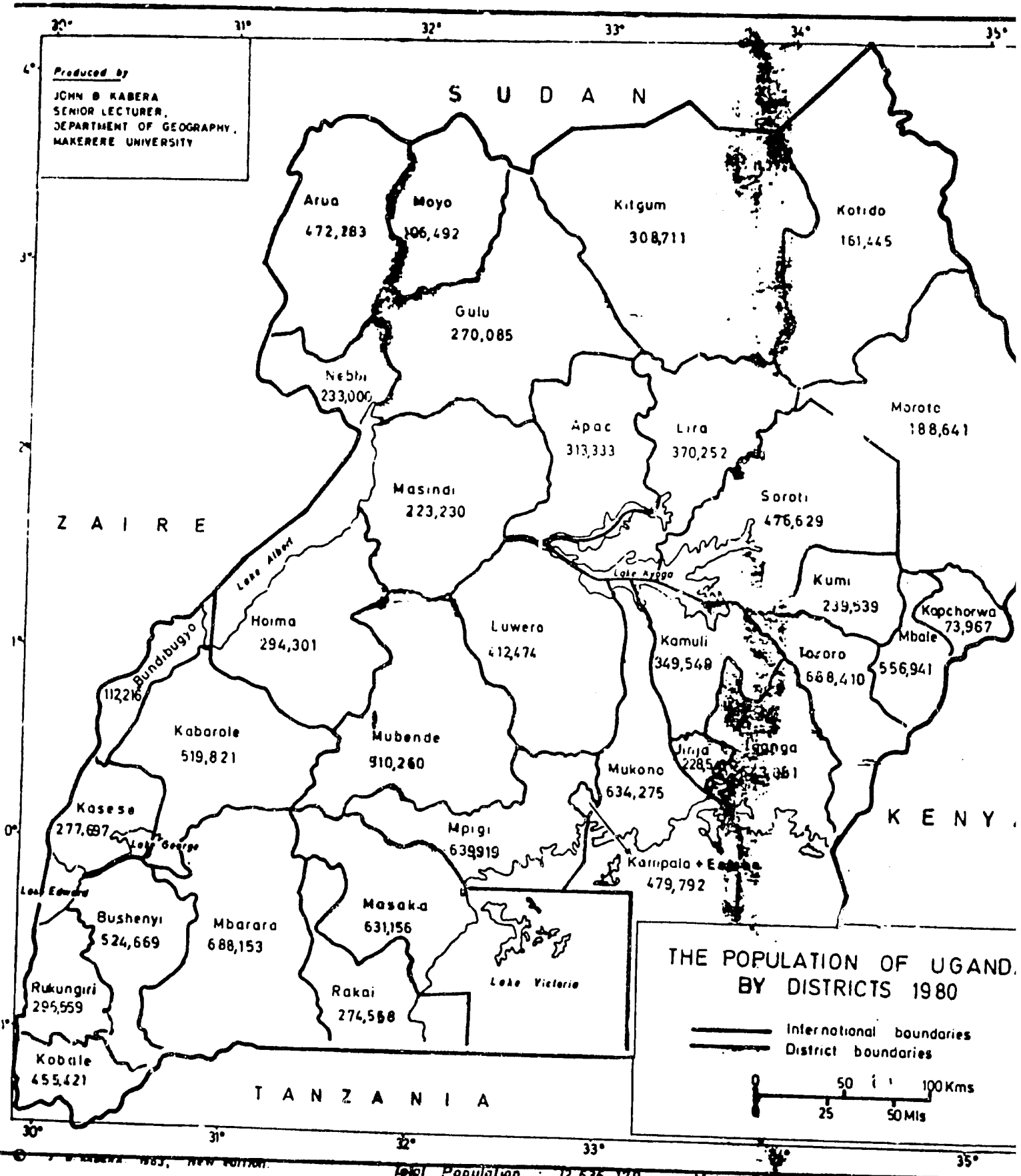
The agricultural areas are found within a range of altitude from 600 to 2000 meters above sea level. An extended range of cropping is possible. Wheat, Irish potatoes and European vegetables are produced in the highlands of Elgon and Kigezi. A wide range of tropical crops grow in the lower areas. Because of the equatorial climate, there is little seasonal variation in temperatures at any one location. There is less than 6°C variation in the maximum and 3°C in the minimum. The strong and regular influence of altitude is seen in Table II.1.

## 3. Rainfall

The annual movement of the sun back and forth between the Tropics is followed, after a short time, by a belt of low pressure called the Equatorial Trough. This passes Uganda in April/May and again in October/November. This passage, together with associated northeast, southeast and westerly trade winds, largely determines rainfall distribution. At the equator, there are two distinct wet and dry periods each year, the "First Rains" and the "Second Rains." In northern areas, Gulu for example, the two peaks coalesce between May and October, giving a long dry period outside these months. Similarly, southward across the Lake in Tanzania, there is a rainfall concentration between November and March, with a long dry period from April to November.

Although Gulu has an average rainfall of 1500mm annually, and Kampala 1200mm, the latter rainfall is well distributed throughout the year and gives favorable conditions for the coffee crop. The long dry periods of the monomodal rainfall areas make them more suited to the

Population of Uganda by Districts, 1980







## Temperature Data for Some Uganda Stations

Station	District	Alt. Metres	Mean Annl Temp °C	Highest Rec'd °C	Lowest Rec'd °C	Av. Days/y Exceeding 30°C
Butiaba	Masindi	620	25.6	35.6	16.1	140
Kitgum	Kitgum	910	24.7	38.7	11.0	254
Soroti	Siroti	1110	24.2	37.7	13.9	182
Arua	Arua	1280	23.1	37.2	10.0	122
Kampala	Kampala	1310	22.0	33.3	11.2	30
Mbarara	Mbarara	1450	20.6	33.3	10.0	10
Mubende	Mubende	1550	20.4	32.2	10.8	4
Fort Portal	Kabarole	1550	19.1	31.7	6.6	2
Kabale	Kabale	1870	16.6	29.4	2.8	0

TABLE II.2

## Yearly Rainfall and Humidities at Four Uganda Locations

Location	Altitude Metres	Yearly Rainfall mm's	Mean Annual at 9 AM (0600 GMT)	% Rel Hum at 3 PM (1200 GMT)	Months When Rel Hum at 3 PM is Below 55%
Kampala	1312	1180	85	63	1 January
Masindi	1146	1304	80	56	5 Nov-March
Mbale	1220	1186	76	57	5 Nov-March
Soroti	1127	1317	77	48	8 Sept-Apr

annual food and cash crops. The mean annual rainfall map (Figure II.3), with histograms of selected stations, clearly shows the seasonal rainfall distribution. In line between Kabale and Moroto, equal amounts of rainfall are received in each half year. Southeast of this line, more rain falls in the first half. In some northern and western areas, Fort Portal, Horina and Lira, the situation is reversed, while in the north the rainfall peaks are close enough together to constitute one rainy season.

#### 4. Sunshine Hours, Cloudiness and Relative Humidities

Due to the equatorial location, the length of day varies little from 12 hours, and the longer, warmer days of summer in southern African countries are absent, causing certain difficulties in maturation and drying of seed grain crops. Equatorial regions are characteristically cloudy. When this is allied to the well distributed rainfall and the proximity of Lake Victoria, it is not surprising that Kampala has lower sunshine hours and higher humidities than Gulu or Kitgum. This is well illustrated by the days exceeding 30°C in Table II.1. Since air humidities have an important effect on seed viability in storage, it is interesting to compare different locations in which seed operations might be conducted. Those in Table II.2, except for Masindi, are near the main areas of population and potential seed purchase.

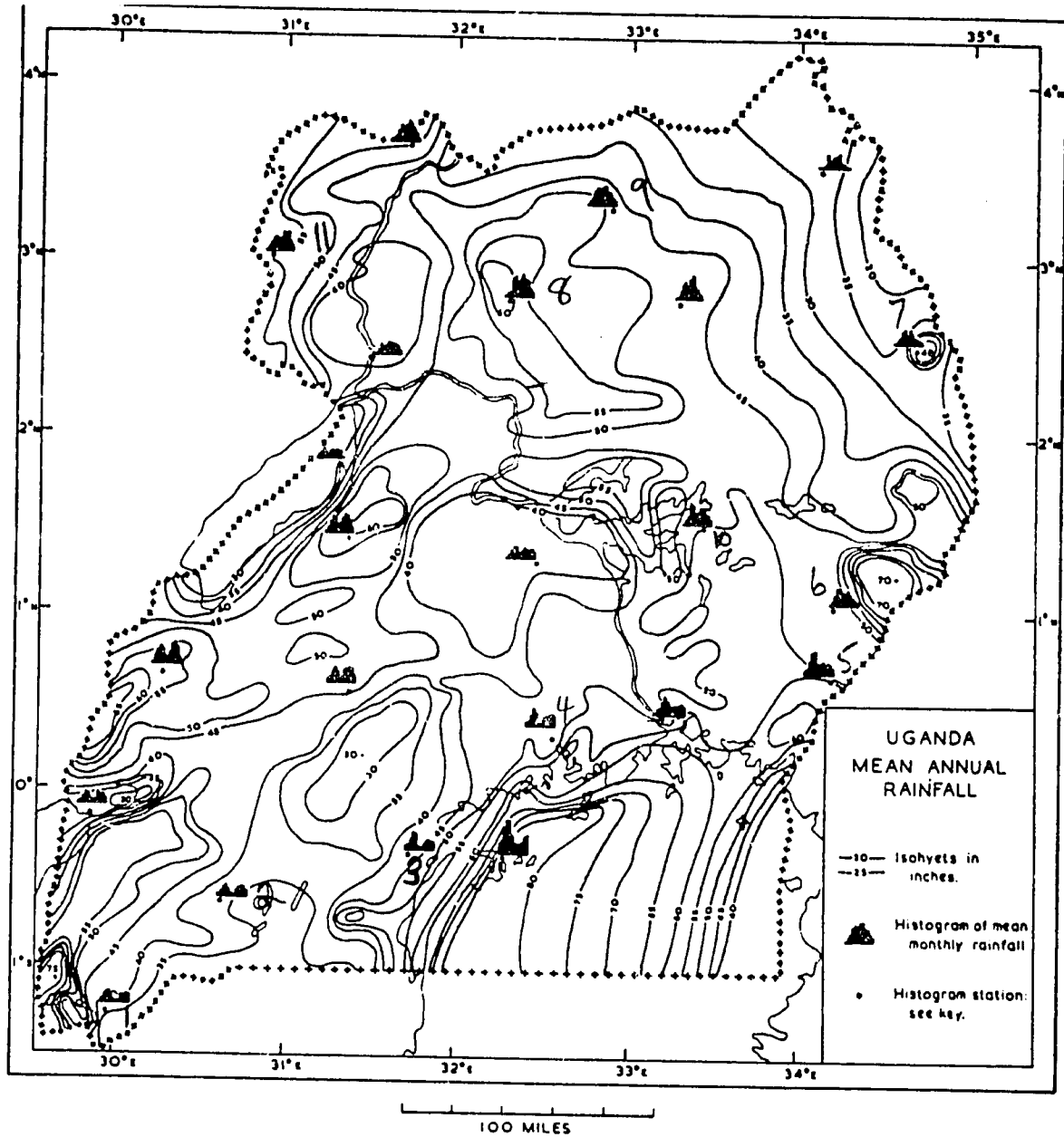
Soroti would have the longest period of lowered humidities for seed processing and storage after a September/October harvest.

#### 5. Agricultural Systems

Migration of many groups of peoples into Uganda has been vigorous and long sustained. It is likely that different groups became dominant in areas where their traditional agricultural techniques well suited the conditions of soil, altitude and climate. It has been the custom to divide cropping patterns simply between planted, perennial crops such as bananas, coffee and cassava, and sown annual crops such as cotton, sorghum and millet. In general, these two patterns fit well into the areas with equable rainfall and those with pronounced dry seasons. During this century, factors such as the increasing importance of the cash economy, the improvement of agricultural techniques, and the rapid population increase, have greatly modified the simpler systems of those who once were mainly pastoralists or cultivators.

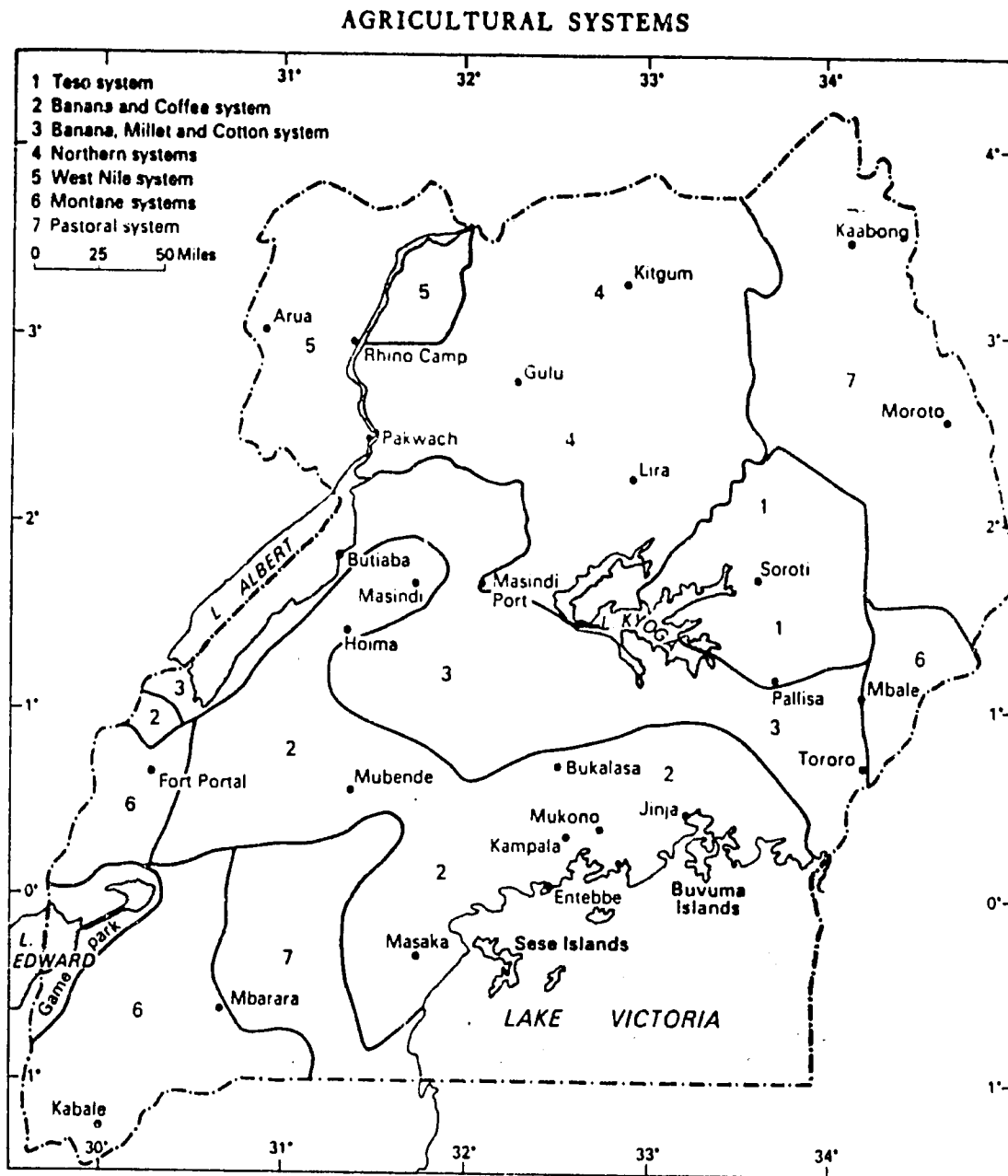
Figure II.4 demonstrates the areas in which the most

Uganda Mean Annual Rainfall



- |   |         |    |        |
|---|---------|----|--------|
| 1 | Kabale  | 6  | Mbale  |
| 2 | Mbarara | 7  | Moroto |
| 3 | Masaka  | 8  | Gulu   |
| 4 | Kampala | 9  | Kitgum |
| 5 | Tororo  | 10 | Serere |

Agricultural Systems



clearly recognized cropping systems are found. In higher areas, arabica and tea replace robusta coffee, while in grain and cotton areas of limited rainfall, finger millet is replaced by sorghum toward the east and by cassava in the west. In semi-arid areas of Karamoja and Ankole only pastoral systems are possible. Descriptions of the systems below give useful information, both on the location of markets for food crop seeds, and the areas best suited for seed production.

(a) The Teso system around Soroti. This is based on the production of annual crops in an environment characterized by light soils of moderate fertility, heavy precipitation in the rainy season, and a prolonged dry season from November to March. Food grains must be stored after harvest for most of the year. Farm size is larger, on average, than other areas of Uganda, at around 4 Ha. per family. In the early 1970s, the main cash crop was cotton, although the value was almost equalled by annual sales of the large numbers of cattle. Both cotton and livestock production have declined in recent years. The main food crops are finger millet, sweet potatoes, cassava, cowpeas, groundnuts, sorghum and sesame. The area is characterized by the greater use of ploughs and other mechanical cultivations, and the influence of Serere Research Station, near Soroti, has had a marked effect since its foundation in 1919.

(b) The banana and coffee system. This is used mainly in the fertile crescent around Lake Victoria. It is based on bananas as the main food crop, and robusta coffee as the main cash crop. These perennial crops surround smaller areas of annual food crops near the homesteads. Maize is becoming more important because of increased labor costs for bananas. Sweet potatoes, groundnuts, beans, brewing sorghums and a range of horticultural crops are also grown for home consumption and sale of surplus to town markets in Kampala and Jinja. The extent of mechanical cultivation is not great, and cattle are of small importance. Farm size is very small, at little over 1 Ha. per family.

(c) The banana, millet and cotton system. This is found running east and west across central Uganda, to the north of the banana/coffee system. As the dry season becomes more definite away from the Lake, so coffee is replaced by cotton and finger millet, and greater reliance is placed upon annual cropping, with sorghum, groundnuts, cowpeas and tobacco. Beans are frequently grown interplanted with the other crops. The area cultivated per family is not much greater than in system (b) above, and cultivation is mainly by the hand hoe.

(d) The Northern system. This is found in areas north of the Teso system, the districts around the towns of Lira, Gulu and Kitgum. These areas have a fertile soil, a monomodal rainfall system, and in general are less heavily populated. The main food crops have to be stored throughout the year. Intercropping is common with most crops. Tobacco, cotton and sunflower are grown as cash crops. Food crops are finger millet, sorghum and cassava, and also groundnuts, sesame and pigeon peas. Agricultural customs here have a greater tradition of communal cultivation, so that ox and tractor cultivations have become more common. The area cultivated per family is slightly less than in Teso, but greater than in other systems.

(e) The West Nile system. This is similar to system (d) but is modified by climate and custom. Along the Nile, soils are generally sandy and rainfall is light. Many areas are populated by peoples of Sudanic origin with different cultivation traditions. The acreage of cassava is usually greater than millet; it is a crop which demands less labor, and allows time to be spent fishing along the Nile.

(f) The Montane system. Different cropping is practiced in several locations, but all areas are heavily populated and frequently the same crops are grown on the same land year after year. Rainfall is high and reliable, and two crops can be grown each year. Montane systems are found in:

The Kigezi districts around Kabale. Sorghum is the main food crop, followed by sweet potatoes, finger millet and beans, with some groundnuts, peas, maize and Irish potatoes. There is also extensive cultivation of European type vegetables.

The Rwenzori districts of Kasese and Kabarole. Food crops predominate, particularly bananas, cassava yams, finger millet, maize and beans. Arabica coffee and tea are of increasing importance as cash crops.

The Mount Elgon districts around Mbale and Kapchorwa. In the south, bananas are grown on large areas, both for food and for brewing. In northern areas, maize is becoming of greater importance. Finger millet, beans, sweet potatoes and yams are other food crops. Arabica coffee and tea are grown for cash.

(g) The Pastoral system found in Karamoja and parts of Ankole, where agriculture is dominated by the unreliability of the rains and the long dry season from November to April. Few, if any, crops are grown by the Bahima people of Ankole, who obtain these from neighboring areas by the

barter of their cattle products. The Karamojong peoples regard cattle as of particular importance, but small areas of sorghum, maize, millet, beans and groundnuts are grown in the best favored areas. The average area cultivated would be less than 1 Ha. per family.

## 6. Agriculture in General

The last 15 years have been ones of considerable political unrest and war. These factors, together with low world commodity prices, have had a serious effect upon the prosperity of Uganda. Until the 1970s, agriculture was able to produce both increased coffee and cotton exports, and a surplus of basic foodstuffs. Livestock numbers decreased considerably during the wars. World cotton prices are low, leaving coffee as the major export foreign exchange earner. Agriculture has regressed, due in part to a subsistence system in which small surplus food crops are sold to private dealers or the Produce Marketing Board, or taken to a local market.

In all areas of the country there are larger farms which belong to the government, or are owned by business people and senior civil servants. These farms are likely to be of great importance to the economic production of certified seeds of food crops.

## C. Economic Situation

A summary by Winch (1987) presents a historical overview of recent economic history and the current reform program. This is attached in Appendix C. Summary points from that report appear here:

- o At independence, Uganda had a strong and promising economy and one of the best transport systems in Sub-Saharan Africa.
- o Between 1963 and 1970, real Gross Domestic Product (GDP) grew by 5.8 percent per annum.
- o Starting in 1970, political turmoil and gross economic mismanagement radically changed the situation. This culminated in the Liberation War of 1979, resulting in further destruction.
- o Between 1981 and 1984, economic growth increased in response to economic policy changes and considerable donor assistance. Agricultural production was stimulated so that real GDP grew at an average annual rate of 6%.

- o Beginning in 1984, increased political and military opposition led to increased military expenditures and weakened fiscal and monetary control.
- o In 1985 the civil war led to a major disruption of productive activities and a severe shortage of foreign exchange which has always been scarce.
- o In January 1986, when the current government came to power, the economy of Uganda was devastated. Infrastructure, especially transportation networks, were destroyed. Since then the Ugandan Government has taken major steps to re-establish peace and security and rehabilitate the economy.
- o "The shortage of foreign exchange constituted a major constraint to economic recovery, as the Government had to use one-half of its limited foreign exchange earning to import fuels and basic essential commodities and the other half to finance debt service." (Winch, 1987, page 3.)
- o Fiscal and monetary performance deteriorated in 1986. The budget for FY '86 sought to accelerate the country's recovery effort by doubling budgetary outlays over those of the previous year. With a shortfall in government revenue, the budget deficit increased. This was financed from the banking sector. The overvalued exchange rate severely penalized producers while at the same time reducing revenues from coffee exports.
- o Facing this worsening situation, the Ugandan Government formally announced an Economic Recovery Program on May 15, 1987. The stated goals are:
  - 1) restore price stability and a sustainable balance of payments position;
  - 2) substantially improve capacity utilization in the industrial and agro-industrial sector;
  - 3) improve producer incentives;
  - 4) restore discipline, accountability and efficiency in the public sector;
  - 5) improve public sector resource mobilization and allocation.

Specific actions already taken include currency reform, a 77% devaluation, increases in producer prices in cash and food crops, increases in petroleum prices, and increases in



civil service salaries and wages. In coming months the Government plans to set up an Open General Licensing (OGL) system for foreign exchange allocations and a credit facility for local cover for imports.

There is little question that the direction of the changes will need to be continued in order to re-establish macro-economic stability. Inflation continues to be high, perhaps at 200% per annum. The official exchange rate is 60 Ugandan Shillings per one U.S. dollar. The black market rate in October 1987 was over 200 to one.

In the past, the political/economic situation in Uganda was considered bleak. More recently, new government moves toward adopting more realistic economic policies and a marked decrease in political unrest have improved the prospects of attracting greater private investment. However, much will still depend upon continued improvement in the attitude of the current government toward private investment, and on its ability to maintain political and economic stability.

The general sentiment is one of "doing something" for the country. This often requires becoming intimately involved in the choices being made. There is a wide range of ideological points of view which, at times, leads to pragmatic outcomes and other times to mixed signals. The economic, political and racial history of the country points to a widespread distrust of the private sector, especially traders. Unless the macro-economic situation continues to improve, this fear of the private sector will be difficult to eliminate. This arises because of such factors as high inflation and limited credit available to the private sector.

An overvalued currency favors short term trading activities with little risk over longer term production-oriented activities with higher risk. A major part of the risk associated with production activities in Uganda is the imposition of price controls, often ex post, on products determined by the government to be important. While foreign exchange may become less of a problem (because of donor and IMF actions, among others), the government's attitude to "do something to help" consumers by keeping consumer prices low will dampen entrepreneurial activities.

Given the common misconception in many developing countries (including Uganda) that seeds should be sold at low prices (subsidized or not), it is important to stress to Government that unless prices are established on a realistic competitive basis, allowing for reasonable profit margins, there will continue to be little incentive to invest in or produce seeds.

D. Organization and Structure of Agriculture

1. Overview

Uganda's national output, exports, income generation, and government revenue are dominated by the agricultural sector. Agriculture accounts for over 95% of official exports (95% of which is coffee), approximately 50% of Gross Domestic Product and provides employment for over 90% of the working population. Nevertheless, current production levels are comparatively lower than those achieved in the sixties and early seventies. See Table II.3. While the role of agriculture in the economy of Uganda is quite important, the potential of the sector is much greater. Uganda is endowed with adequately rich, natural resources which if properly exploited would result in production of food crops, among others, which would not only feed the population and provide the raw materials for further expansion of agro-industries, but also could provide exports. But the factors constraining agricultural development are many. Summarizing from a report by Ronco (1987, page 35), four critical requirements, currently in part or wholly missing, include:

- a) tested and proven production increasing technology such as high quality seeds of improved varieties.
- b) adequate supplies of production goods.
- c) an adequate marketing system.
- d) policies, especially price policies, that provide incentives to adopt new technologies.

"At the moment, the absence of a system that generates and extends production increasing technology may not be operatively a serious constraint. In the absence of conditions outlined in b, c and d above, farmers may not be able and/or willing to employ an improved technology, even if it were introduced, especially if it involved substantially increased cash expenditures."

The government of the National Revolutionary Movement has established goals to increase food output which respond on paper (and in part) to the assertions made above. These goals include:

- o providing farm inputs, seeds, and transport
- o establishing produce buying centers throughout the country in order to facilitate marketing
- o making available food crop finance
- o regularly revising producer prices so as to ensure incentives to farmers

TABLE II.3  
Area Planted and Production of Selected Food Crops  
1978-1986

	PLANTAIN:		CEREALS					ROOT CROPS				PULSES				OIL SEEDS				
	Bananas	Finger Millet	Raize	Sorghum	Rice	Wheat	TOTAL	Sweet Potatoes	Irish Potatoes	Cassava	TOTAL	Beans	Field Peas	Cow Peas	Pigeon Peas	TOTAL	Ground Nuts	Soya Beans	Sesamia	TOTAL
AREA PLANTED ('000 HECTARES)																				
1978	1,287.0	510.0	450.0	286.0	24.0	7.0	1,277.0	476.0	37.0	529.0	1,042.0	389.0	34.0	80.0	105.0	507.0	274.0	6.0	137.0	377.0
1979	1,173.0	515.0	272.0	187.0	12.0	3.0	787.0	256.0	21.0	322.0	599.0	227.0	19.0	45.0	58.0	347.0	122.0	4.0	80.0	186.0
1980	1,173.0	279.0	258.0	167.0	11.0	8.0	723.0	271.0	24.0	302.0	557.0	224.0	17.0	35.0	50.0	329.0	95.0	4.0	55.0	164.0
1981	1,180.0	300.0	280.0	170.0	12.0	4.0	745.0	250.0	25.0	310.0	685.0	299.0	16.0	31.0	55.0	413.0	110.0	5.0	70.0	185.0
1982	1,199.0	330.0	285.0	200.0	15.0	5.0	835.0	372.0	28.0	331.0	751.0	364.0	20.0	45.0	50.0	489.0	120.0	6.0	90.0	266.0
1983	1,209.0	341.0	295.0	207.0	17.0	5.0	855.0	457.0	30.0	372.0	859.0	358.0	22.0	40.0	62.0	538.0	124.0	6.0	95.0	255.0
1984	1,205.0	332.0	347.0	206.0	17.0	4.0	906.0	297.0	17.0	461.0	805.0	385.0	18.0	45.0	72.0	522.0	172.0	11.0	80.0	269.0
1985 (Revised)	1,210.0	300.0	289.0	190.0	14.0	5.0	798.0	259.0	25.0	309.0	684.0	324.0	17.0	44.0	60.0	455.0	134.0	10.0	70.0	210.0
1986 (Estimate)	1,211.0	290.0	295.0	197.0	15.0	5.0	802.0	285.0	25.0	290.0	706.0	356.0	21.0	21.0	42.0	442.0	80.0	9.0	30.0	119.0
PRODUCTION ('000 TONNES)																				
1978	8,855.0	561.0	594.0	351.0	26.0	14.0	1,546.0	1,689.0	292.0	2,078.0	4,910.0	291.0	14.0	31.0	42.0	378.0	197.0	6.0	40.0	233.0
1979	8,090.0	481.0	453.0	316.0	15.0	5.0	1,270.0	1,272.0	131.0	2,100.0	3,502.0	182.0	6.0	22.0	19.0	229.0	69.0	2.0	16.0	99.0
1980	5,899.0	459.0	286.0	249.0	17.0	17.0	1,079.0	1,260.0	166.0	2,072.0	3,478.0	175.0	7.0	16.0	26.0	182.0	70.0	2.0	20.0	95.0
1981	5,900.0	480.0	542.0	320.0	15.0	8.0	1,165.0	1,700.0	175.0	2,000.0	4,475.0	240.0	5.0	18.0	25.0	291.0	80.0	5.0	25.0	110.0
1982	6,595.0	528.0	393.0	358.0	19.0	10.0	1,308.0	1,487.0	196.0	2,127.0	4,810.0	200.0	10.0	20.0	28.0	350.0	90.0	5.0	25.0	131.0
1983	6,647.0	545.0	412.0	407.0	22.0	12.0	1,399.0	1,647.0	223.0	2,290.0	5,305.0	214.0	12.0	27.0	29.0	397.0	95.0	7.0	42.0	148.0
1984	6,461.0	223.0	281.0	164.0	20.0	7.0	895.0	1,791.0	78.0	1,881.0	3,750.0	265.0	13.0	29.0	25.0	342.0	119.0	9.0	39.0	166.0
1985 (Revised)	6,455.0	460.0	343.0	310.0	19.0	11.0	1,167.0	1,514.0	166.0	2,709.0	4,352.0	267.0	8.0	35.0	20.0	338.0	84.0	8.0	33.0	125.0
1986 (Estimate)	6,660.0	464.0	254.0	312.0	19.0	10.0	1,159.0	1,589.0	175.0	2,610.0	4,374.0	285.0	10.0	18.0	20.0	335.0	60.0	7.0	20.0	99.0

Source - Planning Unit, Ministry of Agriculture and Forestry

- o guaranteeing a market for food crops by entering into commodity barter trade arrangements
- o rehabilitation of trunk roads and the rural road system.

## 2. Farm Size

As described above, agriculture in Uganda involves simple, low input-low output production with a varied and complex mix of crops and livestock. Typically a household consisting of a man with one or two wives and 3 to 10 children will farm 1.5 to 5 hectares with up to one-half being fallow at any one time. There are variations throughout the country which arise from the different agro-ecologies, but those variations can still be generalized to generally equitable land use when productivity is concerned. Many of the larger farms are government owned. Many of these remain unused because of the civil strife. Others, like the prison farms, are designed to provide for prison or government needs. The intensity of land use varies around the country, with some areas in the fertile crescent under some population pressure. While there is a large potential for increasing agricultural production, the institutional weaknesses, non-availability of inputs, and relatively low profitability will hinder development, given the small size of the great preponderance of farms.

## 3. Labor

Several reports, as well as ICD team field interviews, reveal shortages in hired labor for many agricultural activities. Prior to 1972, much of the hired labor in the fertile crescent around Lake Victoria came from outside of Uganda. The Amin regime effectively closed down that source and, with the rapid deterioration of the economy and decreasing effort put into labor intensive activities in coffee and cotton production, much labor used on the farm became family labor. Men had fewer off-farm employment opportunities and women were required to do even more than before. Hence, there still remains a high demand for hired labor (used for, among others, land clearing and preparation and harvesting of row crops), which will inhibit a move away from subsistence agriculture and locally marketed food crops into traditional export crops or production of non-traditional but exportable surpluses of food crops.

## 4. Land Tenure

Land tenure in Uganda is unclear and ambiguous. Its clarification is one of the requirements for augmented agricultural production.

Prior to the Land Reform Decree of 1975 (Amin), 75% of all land was held under customary tenure comprised of either communal/tribal ownership or clan/family ownership. The remaining land was held in freehold or the freehold-like system called "mailo" in Buganda. However, the political unrest, as well as other factors, has led to a lack of knowledge about actual land tenure practices. Land registers are grossly out of date and the 1975 Decree has not been systematically applied.

The World Bank/Government of Uganda Land Tenure Study (1987) summarized the 1975 Decree. The Land Reform Decree of 1975 states that all land formerly in private individual tenure such as mailo and freehold is declared Public Land and mailo and freeholds are converted to 99 year leases from the Land Commission. In the case of charitable and religious institutions, the lease is 199 years. In addition, the decree repeals a number of acts which had provided statutory protection to tenants on former mailo and freehold lands.

These are now considered to be customary tenancies and tenants can be evicted if the leaseholder on conversion considers this necessary to develop the land, on payment of compensation for tenant's improvements. On land outside the former mailo and freehold areas, customary tenure continues in force but is held on sufferance; the state may on six month's notice evict customary holders and lease the land to someone else.

It has been argued that the purpose of the Decree is to force development of idle land. This was reiterated a number of times during the ICD Team visit. Analysis by others suggests that idle land is more likely the result of poor product prices, lack of available credit and shifting agricultural cultivation practices.

The uncertainty surrounding land tenure policy and the lack of systematic application of the 1975 Decree has led to seizures and boundary disputes. A firm process of settling land disputes and bringing stability to tenure is required. Under present conditions, land cannot be offered as collateral on loans. A permanent system should be devised to give farmers both land tenure stability and greater access to credit.

#### E. Present and Projected Developments in the Seed Industry

##### 1. General

The Uganda Seed Project was established in 1970 to produce improved seeds of the food crops maize, sorghum,

millet, beans and groundnuts; the oil seed crops sesame and soya beans; and the most important tropical grass and legume pasture seeds. Varieties handled were those most recently produced by the research stations at Kawanda, near Kampala, and Serere, near Soroti. They had proved themselves by variety trials throughout Uganda. Good supplies of breeder seed were available each year from these research stations. In addition, quantities of hybrid maize were imported from the Kenya Seed Company of Kitale each year.

Seed processing was located at Masindi in buildings belonging to the Bunyoro Cooperative Union. This union was responsible for the financing of seed production, carried out mainly in the Masindi and Gulu regions; processing and distribution to cooperatives and other agents over Uganda; and the collection of seed revenues. Seed testing and certification was based at Kawanda Research Station. Senior Management of all sections was employed and paid for by the Ministry of Agriculture, Forestry and Cooperatives.

Production and distribution of all seeds amounted to some 200 tons in 1971, 360 tons in 1972 and 500 tons in 1973. After that period came increasing internal problems and the withdrawal of support from the U.K., the Project's original sponsor. Seed continued to be produced and distributed but with increasing problems. Research stations could not continue the supply of breeder seed. Foundation seed crops were lost. There were many difficulties associated with crop inspection and certification. By the early 1980s, production had lapsed to about 20 tons annually of one crop alone, maize.

In 1983, the EEC was among several donors who recognized the importance of improved seeds to Ugandan agriculture. Some U.S.\$ 10 million have been committed by the EEC toward the Uganda Seeds Project, and a team of four expatriate experts is assisting with research, production and staff training. At present, work is centered around Masindi and is concentrated on maize, sorghum, beans and groundnuts. All the staff are employed by, or seconded to, the Ministry of Agriculture and Forestry. Progress has been sporadic because of security problems which caused delays and pauses in implementation.

## 2. Research

Any seeds project or company should supply farmers with good quality seed of the best crop varieties. Research can help in three important ways:

(a) By the breeding or selection of new varieties (cultivars) giving superior yield, earlier maturity, superior disease and pest resistance and superior grain quality;

(b) By ensuring, through a chain of Variety Testing Centers, that new material really is superior under a range of conditions;

(c) By providing constant inputs of breeder seed to maintain the true performance of such superior varieties.

At this time, seed stocks are not true to type. This can clearly be seen in the crops presently multiplied. The research stations are either out of action or are slowly recovering after a period of inaction. The last years have seen the loss of all stocks of breeder seed. The research stations have breeders who will be working to recreate breeder seed stocks. They are based:

For Maize ) at Kawanda  
Beans

For Groundnuts )  
Soya Beans ) at Namulonge  
Root Crops

For Sorghum )  
Millet ) at Serere  
Groundnuts

Kawanda and Namulonge are situated a few kilometers north and northeast of Kampala, and are in areas typical of the banana coffee agricultural system. Serere is a few kilometers southwest of Soroti, in the heart of the area where the Teso system is practiced.

If we assume, from this time, that political stability and order return to Uganda, it will take some 3 to 4 years before reliable stocks of breeder and foundation seed are produced. Considerable assistance is being given by USAID toward the rehabilitation of testing centers and with equipment and other facilities at research stations. Within a period of 3 years, new varieties may become available when the research backlog has been cleared. This would be very useful because of the old age of many varieties currently used, and the susceptibility of the only maize--Kawanda Composite A--to the streak virus.

### 3. The Uganda Seeds Project

This project, supported by the Ministry of Agriculture and the EEC, is presently the only producer of foundation and certified food crop seeds. It exists as a department within the Ministry, with offices and staff at Entebbe, Kawanda, Masindi, and the new farm at Kisindi, and at Serere. It is responsible for all aspects of its own production, distribution, quality control and certification. Its historical production is shown in Table II.4.

Processing is carried out at Masindi. Existing machinery is 20 years old but will soon be augmented by new machines imported with EEC assistance to bring total capacity to around 2000 tons per annum. Distribution is limited mainly to the Masindi region through the Cooperative Union, but some sales are made to the Central Union in Kampala, some Ministries, some relief agencies and various local markets. Some of the main crop centers in Uganda are out of reach because of transport difficulties and local unrest.

Production of foundation seed is carried out at the new farm at Kisindi, which is now attempting breeder seed as well because of research station problems. The farm covers 1000 Ha. Four hundred hectares have been cleared from bush and are this year producing maize, sorghum, beans and groundnuts. The farm is being very well equipped with machinery, workshops, storage warehouses, seed drying and processing facilities, and housing. This work, assisted by EEC funds, is almost complete.

Certified seed is produced partly at Kisindi and partly by contract growers near Masindi. These are mainly small growers, but contracts are also being placed with large prison farms such as Isimba, where 1300 Ha. are farmed to provide food. This farm in the past was a major contract grower of Uganda seeds and presently has been contracted to produce 200 tons of maize seed. Some 400 tons of maize and sorghum seed were produced in 1986. Because of the limited area for distribution, there has been difficulty in marketing. Production in 1987 will also include beans and groundnuts.

### 4. The Karamoja Seed Project

The project was established several years ago by the Church of Uganda. It operates in the districts of Moroto and Kotido, remote areas of northeastern Uganda. The climate is semi-arid and forces a system of nomadic pastoralism of cattle and small plots of cereal and legume food crops around the settled villages. The project is



## Production of High Quality Seeds of Improved Varieties 1970-86

Production of High Quality Seeds of Improved Varieties (in tonnes)

Year	Ground	Maize	Beans	Soya	Sorghum	Millet	Sim Sim
1970	154.8	16.8	3.9	18.1	26.1	-	-
1971	198.8	95.8	21.5	14.6	21.9	6.3	-
1972	478.6	14.3	10.2	19.1	-	-	-
1973	253.0	54.3	17.2	11.5	9.8	8.3	-
1974	363.3	1012.0	86.6	20.0	30.0	3.5	0.6
1975	67.8	139.7	67.7	104.4	24.6	2.8	2.0
1976	43.1	70.8	33.1	10.3	16.7	2.2	0.5
1977	11.7	81.8	26.4	1.2	21.4	7.9	-
1978	3.5	104.2	13.9	12.9	7.6	3.5	0.99
1979	16.5	68.2	3.8	12.9	3.2	2.7	-
1980	-	14.0	-	-	-	-	-
1981	-	40.0	-	-	-	-	-
1982	-	20.0	-	-	-	-	-
1983	254.5	62.1	-	-	-	-	-
1984	-	600.0	100.0	-	-	-	-
1985	-	495.0	-	-	-	-	-
1986	-	392.0	-	-	17.2	-	-

Source: Uganda Seed Project reproduced in "Final Summary Report," Uganda Agricultural Task Force Program, Agricultural Policy Committee, April 15, 1987, p. 36.

designed to be financially self supporting. Seed production is expensive because of low yields and small contract areas per grower. This appears in the 1986 production details:

<u>Crops</u>	<u>Ha. Contracted</u>	<u>Tons of Seed Produced</u>
Groundnuts	200	50
Sunflower	110	32
Maize	255	135
Sorghum	160	102
Millet	14	5
Other legumes	<u>10</u>	<u>2</u>
TOTAL	749	326

Two hundred-thirty growers were contracted to produce this 326 tons of seeds.

The Project operates independently from the Ministry of Agriculture, conducts its own inspections and laboratory tests, and decides its own buying and selling prices. Seed is processed and stored at Kotido. It was developed out of low level research into the seed requirements of Karamoja farmers. Marketing of seeds is carried out by various relief agencies, some of whom distribute seeds at or below cost price. Because of civil unrest in some northern and eastern regions, the 1986-87 seed distribution has been adversely affected. At this time some 200 tons of seeds are carried over from the 1986 harvest. Because of the dry climate, storage conditions are fairly good. The project is equipped with adequate processing and warehouse facilities. With aid from the Church of Uganda, it can import necessary inputs such as chemicals, packaging materials, and machinery spares.

At this level of production, the Project needs access to seed markets outside Karamoja. Prices paid to contract growers are generous and are reflected in selling prices, which are higher than those of the Uganda Seed Project. In the opinion of the management of the Karamoja Project, there is scope for expansion with finger millet and sorghum, and with oil seed crops such as groundnuts, sunflower and soya beans.

##### 5. The Masaka Project

This Project is due to be established in the near future, assisted by G.T.Z., the West German aid agency. It will be based at the District Farm Institute (DFI) near Masaka. Processing machinery and other facilities will be installed and 3 expatriate experts will be employed. Some 7 million D.M. (3.5 million U.S. dollars) are committed to Phase I for the first three years.

The grain legumes, beans and groundnuts are in high demand. Soya beans are also becoming more popular. These are crops where high seed rates and low multiplication factors are in operation, and consequently seed supplies are always a limiting factor to increased production. Present varieties of these crops are susceptible to bacterial and viral diseases, and for the last few years very little certified seed has been produced.

The Project aims to use some 100 Ha. of land at the DFI and to recruit several hundred seed growers around Masaka. Seed produced is to be marketed in the Mbarara, Masaka, Rakai and Mpigi Districts, where demand is high. At the end of Phase I, it is hoped to be producing:

625 Tons of beans,  
325 Tons of groundnuts,  
33 Tons of soya beans.

It is estimated that these quantities will supply from 6 to 10% of seeds planted in these regions. At the same time, work will be carried out to introduce or select more productive and disease resistant varieties. After 10 years, it is hoped the Project will be meeting some 30% of seed needs with a production of some 3500 tons of seeds.

#### 6. The African Development Bank (ADB) Feasibility Study

This study, financed by the African Development Bank, will shortly be carried out and will make recommendations for the following projects:

(a) The rehabilitation of government seed farms, either to produce seed for the existing Uganda Seed Project or to distribute seeds within their local areas.

<u>Farm</u>	<u>District</u>	<u>Productive Ha.</u>
Sendusu	Mpigi	130
Kiroko	Masindi	2000
Kamwenge	Kabarole	40
Rugendabara	Kasese	1000
Koich	Gulu	1420
Adyedah	Apac	950

Seeds to be produced would be the usual cereals, legumes and oil seeds.

(b) Oil seed crop development. This is to be effected by the construction of an edible oil mill at Lira, and the promotion of seed production through supplies of improved seeds in northern and eastern Uganda. The districts particularly concerned would be Gulu, Lira, Apac, Soroti and

Kumi. The aid is to increase supplies of edible oil, seriously reduced because of the reduced cottonseed acreage, and to provide by-products for the animal feed industry.

(c) The significant increase of food crop production in southern and western districts. These are Kasese, Kabarole, Bundibugyo, northern Mbarara, and northwestern areas of Mubende, Hoima and Masindi. The crops particularly concerned are wheat, beans, maize, soya beans and groundnuts. An important factor limiting production is the inadequacy and poor quality of seed supplies.

After recommendations have been submitted it is likely that funds for these projects will be available from ADB.

#### 7. Other Seed Developments

These are very limited and in an experimental stage at the present time.

(a) The Uganda Central Cooperative Union (UCCU) has had some production of wheat seed at higher elevations on Mount Elgon in Kapchorwa District.

(b) There is some vegetable seed production, with Korean aid, at the Mubuku Irrigation Scheme in Kasese District.

(c) Some potato seed production (Irish potatoes) in Kabale District. At higher elevations suited for this crop.

### III. FACTORS RELEVANT TO THE DEVELOPMENT OF THE SEED INDUSTRY

#### A. Area Production and Yields of Food Crops and Their Geographical Distribution

##### 1. General

The food crops discussed in this section are those which could usefully be produced and distributed by a private seed company. Because of the problems during the last 15 years, accurate statistics on areas planted and tons produced are not available. At the best of times, these are difficult to collect in a country where some 2 million family farms occupy around 5 million hectares. The figures used were obtained from the planning unit of the Ministry of Agriculture, and are generally agreed to be accurate within acceptable limits. They relate to 1985.

##### 2. Finger Millet

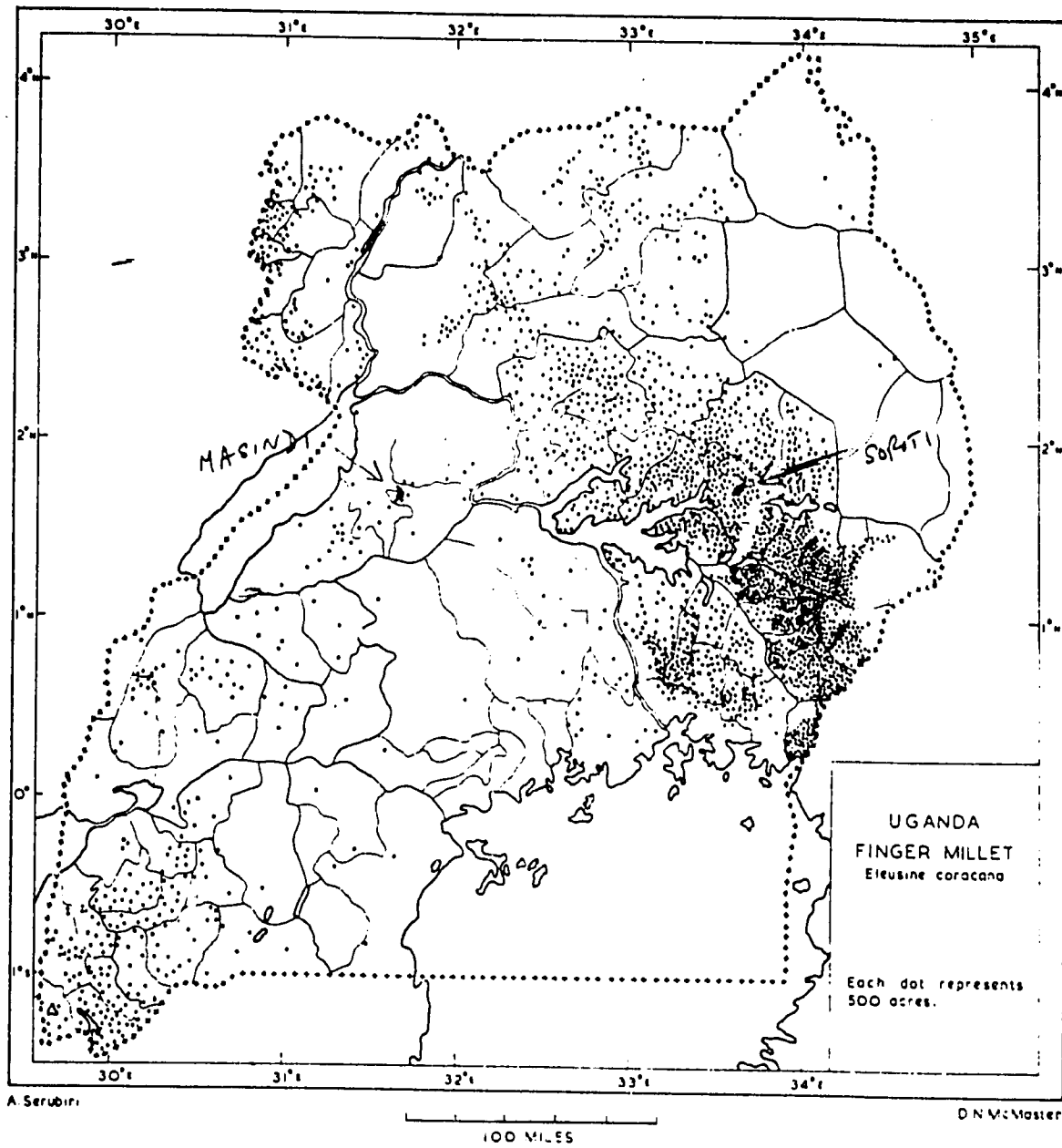
This is an important cereal crop with some 300,000 Ha. planted annually, and some 400,000 tons of total production. It is the staple food of the Nilotic people of the interior plateau, the Bantu people in the western areas, and the Sudanic peoples of the northwest along the Nile. Distribution can be seen in Figure III.1.

Despite the close relationship of the crop with certain groups, the extent to which it is grown also depends upon yield comparisons with other carbohydrate rich crops. Where rainfall is high and equable, maize and bananas are preferred. Where rainfall is uncertain, or soil fertility low, sorghum becomes the main cereal crop. Finger millet is frequently grown in mixed stands, and is used both for food and as a brewing grain.

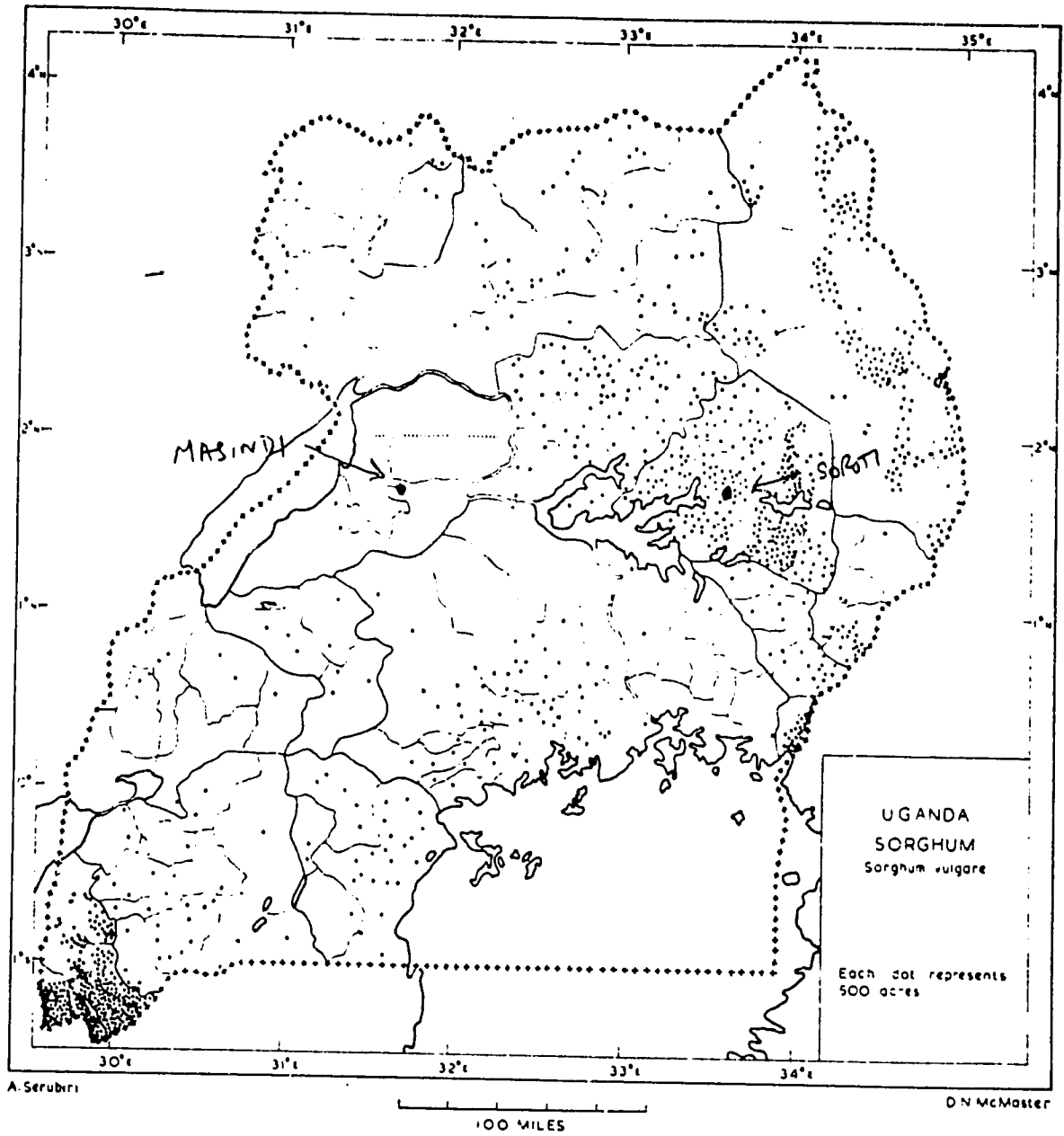
##### 3. Sorghum

Some 190,000 Ha. are planted annually with total yields of 200,000 Tons. At least 25% of this area is planted with varieties of grain type particularly suited for brewing, so food crop plantings should be reduced to 145,000 Ha. The main areas are the higher rainfall areas of Karamoja, Kumi, Soroti and Lira Districts in the interior plateau, and Kabale District in the extreme southwest. Distribution is indicated in Figure III.2. The distribution of the crop reflects its ability to give production under conditions of low rainfall and/or poor soil fertility. It is kept out of more favored areas by competition from bananas, maize, finger millet and root crops.

Uganda Finger Millet



Uganda Sorghum



#### 4. Maize

Areas planted in maize have increased during the past 20 years, from some 250,000 Ha. in 1965 to 350,000 Ha. Maize has never been as important in Uganda as in neighbouring East African countries. As a crop introduced a century or more ago it had to compete with two well-established staple food systems: one based on bananas with grain crops of small importance; one based on the existing grains, finger millet and sorghum, which were better adapted to the drier areas. Maize is probably the most "price responsive" of the cereal crops, and the one of which the greatest proportion is marketed. In consequence, it is most widely grown in areas of high population density, near the towns of Kampala, Jinja, Tororo and Mbale. Other areas include the western borders of Arua District and the Kigezi highlands of Kabale District. Distribution can be seen in Figure III.3.

Maize is a demanding plant, calling for a good soil, adequate rainfall during growth and flowering, and warm days to ripen and dry the grain. There are many areas of Uganda, away from the fertile crescent and montane areas, where millet and sorghum are more reliable crops. Maize is frequently grown mixed with groundnuts or beans.

#### 5. Wheat

The crop can be grown in Uganda at elevations above 1500 meters. Suitable areas are found along the southern slopes of Mount Elgon, the northeast slopes of the Rwenzori and in the Kigezi highlands of the southwest. Increased production would be an advantage by reduction of wheat flour imports. Some 5000 Ha. are grown each year, producing some 6000 tons of grain.

#### 6. Rice

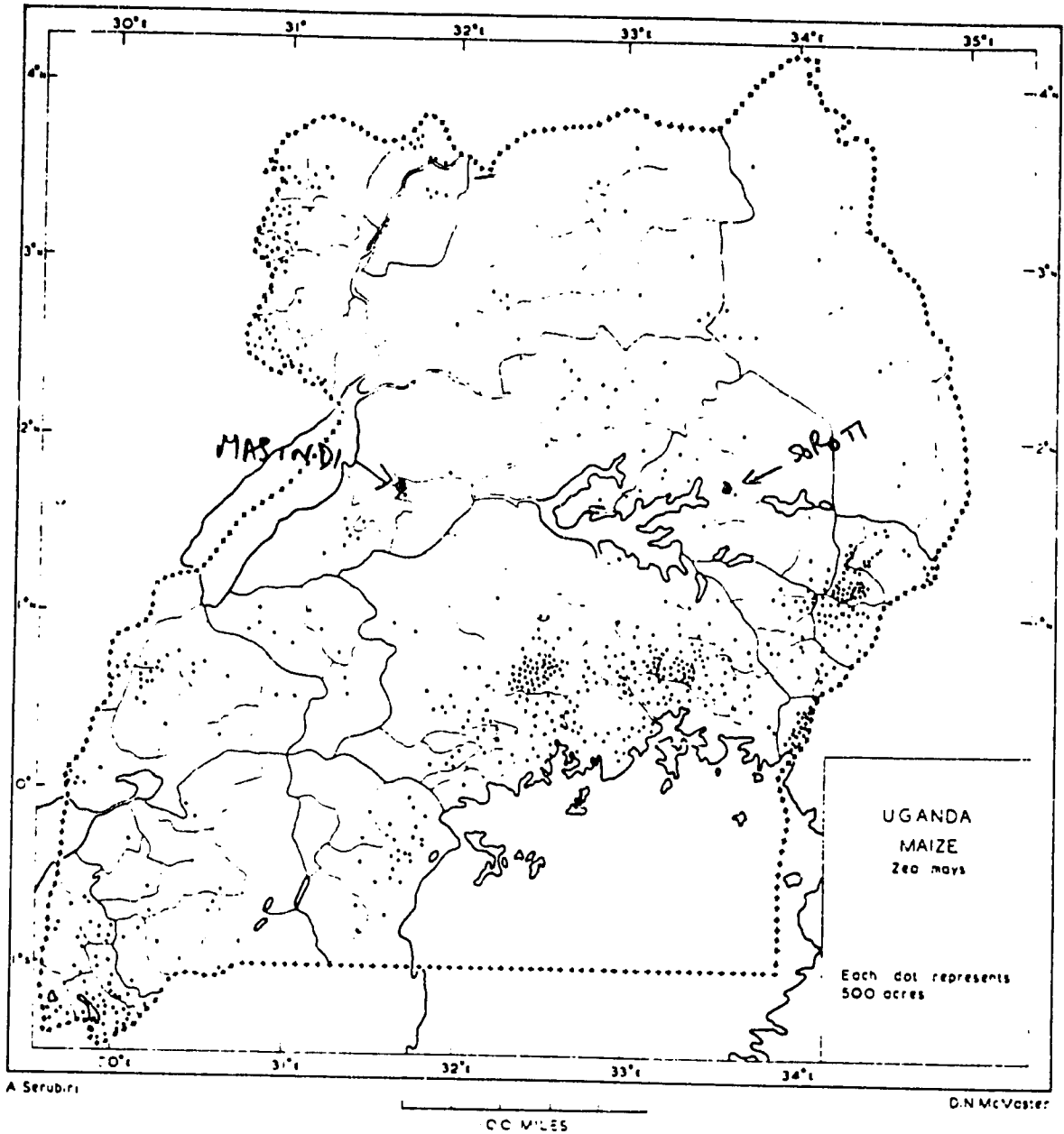
The cultivation of this crop is neither easy nor attractive to the small farmer. It is grown in the hotter areas where waterlogged ground is available at swamp margins. The main districts of production are:

Arua	Northwest
Gulu, Apac, Lira and Soroti	The Interior Plateau
Iganga and Tororo	Southeast
Kabarole	West

Cultivation is limited in all these districts, and the crop is grown mainly for sale, so that areas fluctuate from year to year according to price. In 1985, an estimated



Uganda Maize



14,000 Ha. was planted, giving total yields of 19,000 tons.

#### 7. Groundnuts

Although the crop is grown in many districts, the principal area of production are in the northeast in the areas around Jinja, Tororo and Soroti. In 1985 some 150,000 Ha. were planted to give a production of some 90,000 tons. The early maturing Red Valencia types such as varieties B1 and Roxo are preferred by farmers and by traders because of their higher oil content. Long term varieties of the spreading or semi-erect type such as Mani Pintar or Makulu Red are preferred in the monomodal rainfall areas of the north. During the past century, the groundnut crop, because of easier cultivation and superior yield, has gained ground at the expense of sesame in areas of suitable rainfall. Distribution of the crop can be seen in Figure III.4.

#### 8. Beans

Kidney or french beans (*Phaseolus* spp.) are grown in most districts, although in the north and east in Soroti, Lira, Gulu, Kotido and Moroto, cowpeas or pigeon peas are preferred. Bush types are probably 80% of the crop, with climbing and semi-climbing types of much smaller proportions. Preferred varieties are Banja 2 and K20, which take 70 to 90 days from planting to maturity. With this short growing period it is usual to plant several crops each year, and beans are commonly interplanted with maize, cotton and cassava. Some 270,000 Ha. of bush beans are planted each year, mainly in the wetter bimodal rainfall areas of the fertile crescent and the Kigezi highlands.

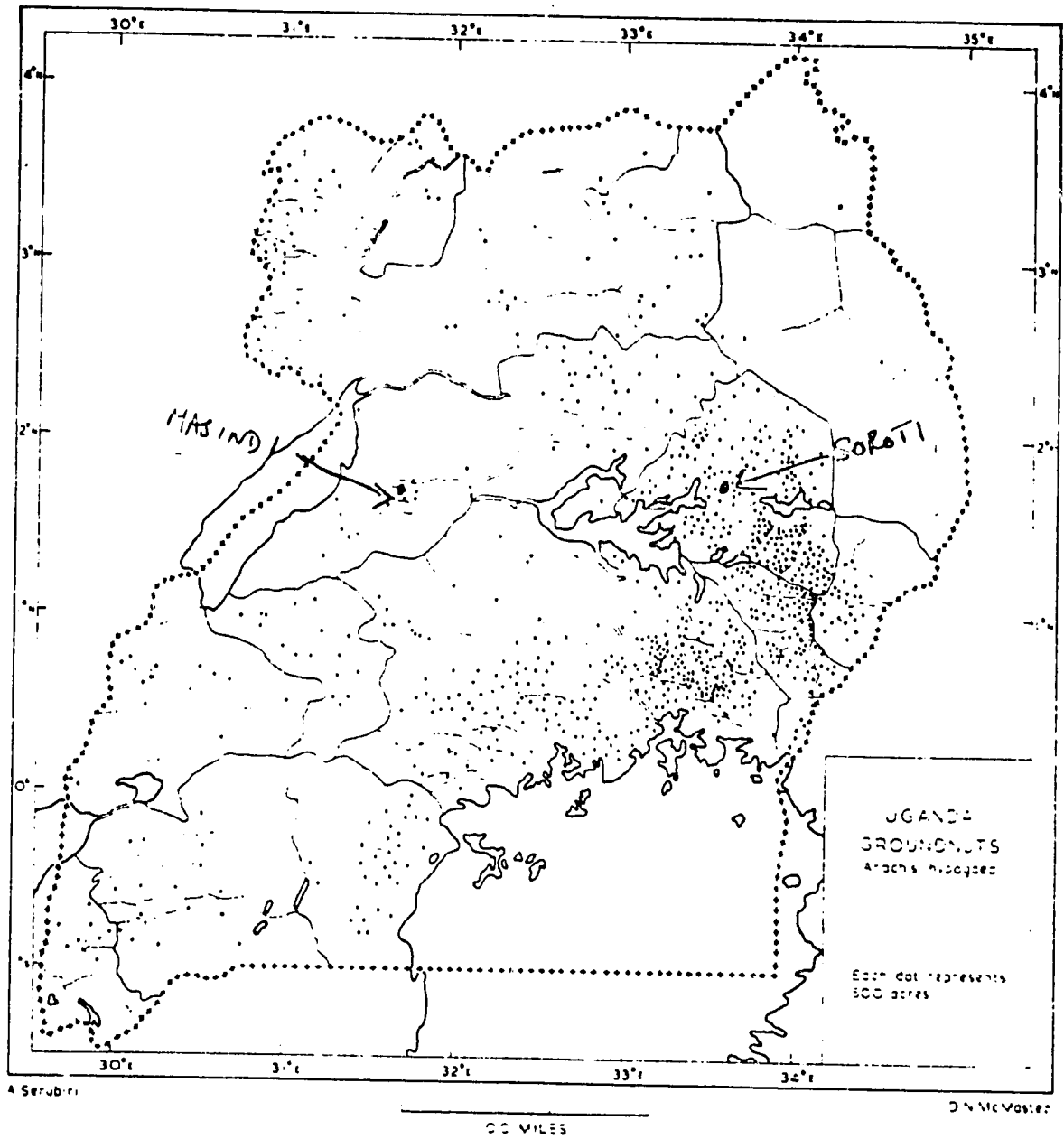
#### 9. Soya Beans

The areas grown have fluctuated greatly dependent on price and market demand. Low yields have been caused by unsuitable varieties and seed of poor germination, since soya seed is easily damaged by rough handling. Because of cooking difficulties the crop could not easily be used in local diets. Local processing industries are being encouraged to use the crop for human and animal feeds. With varieties well suited to Uganda conditions, the crop could make good progress. Some 10,000 Ha. were planted in 1985, mainly along the fertile crescent of Lake Victoria.

#### 10. Sesame

Generally known as "simsim" in East Africa, this crop is better suited to warmer, drier areas of central and northern Uganda. Cultivation is mainly in Arua, Gulu,

Uganda Groundnuts



Kitgum, Lira and Soroti, under moderate rainfall conditions of 400mm annually. Provided there is adequate rainfall at sowing time, the crop grows well under low fertility and modest rainfall. The seeds are valued for their high oil and protein content; and are usually made into a sauce for addition to other dishes. Some 76,000 Ha. are planted annually. Distribution can be seen in Figure III.5.

#### 11. Sunflower

Sunflower will grow in many areas, but is recommended for the drier districts of the north. It is often planted during second rains to have as long a period as possible for the maturing and drying of the seed heads. It is grown mainly in Arua, Gulu and Kitgum Districts, and no more than 2000 Ha. are planted each year. There is a ready market for the seeds, but a lack of the best varieties and considerable bird damage have restricted the areas planted.

Summary data is presented in Table III.1 for area planted, production and yield for 1982-86 for maize, sorghum, millets, beans, groundnuts and simsim.

#### B. The Market for High Quality Seeds of Improved Varieties

Mention has been made of the difficulty in obtaining accurate crop statistics. Calculation of the actual weight planted is even more difficult because cereal crops are frequently intercropped with beans or groundnuts. The proportion of intercropping has not been estimated for many years, but it has been assumed to be the same as in 1968. When two crops are planted together, seed rates of each will obviously be reduced, but the level of reduction is unknown. In Table III.2, purely empirical judgments have been made for these mixed plantings.

A further assumption has to be made in Column 7 of this table, as to the number of years for each crop before a farmer will buy fresh seed stocks and cease to plant his own saved seed. The figures given in Column 8 are merely indications of the market for improved seeds; they are of interest mainly to demonstrate the different ratios between one crop and another.

In Table III.2, the area of sorghum has been reduced by 25% to allow for brewing varieties which are also planted. The area of beans has been reduced by 20% so that bush types only are calculated.

Since we assume in this study that a private seed company could build up production and sales slowly, there would seem to be an adequate market provided that sales

Uganda Simsim

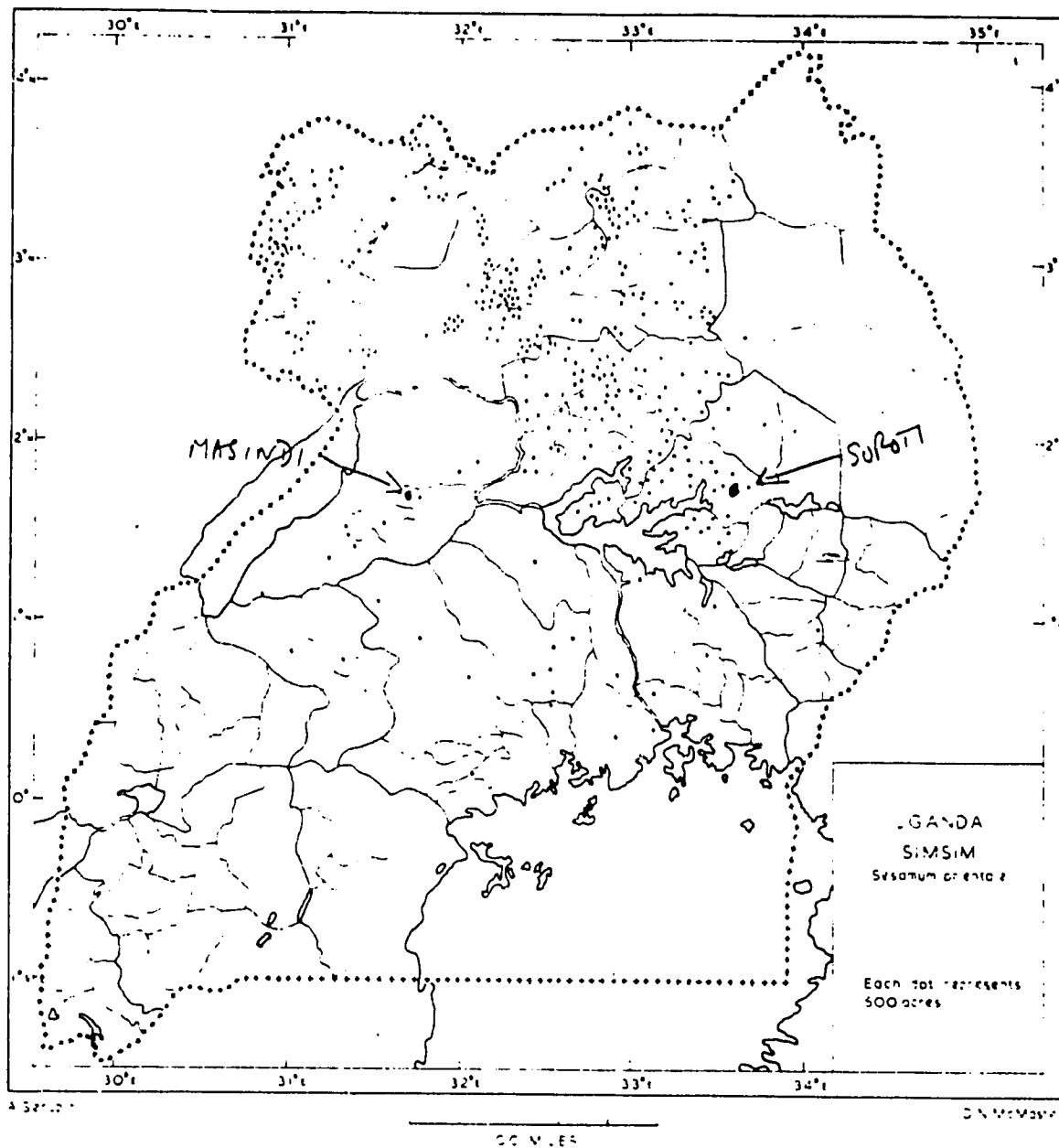


TABLE III.1

## Area Planted, Production and Yields for Main Food Crops, Uganda 1982-86

CROP	1982			1983			1984			1985			1986			AVERAGE YIELD
	A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y	
Maize	285	393	1.379	295	413	1.400	347	281	.810	289	343	1.187	295	354	1.200	1.195
Sorghum	200	358	1.790	207	407	1.966	206	164	.796	190	310	1.632	197	312	1.584	1.554
Millets	330	528	1.600	341	545	1.598	332	223	.672	300	480	1.600	290	464	1.600	1.414
Beans	364	300	.824	398	314	.789	385	265	.688	334	267	.799	356	285	.801	.780
G/nuts	120	90	.750	124	99	.798	172	118	.686	124	84	.677	80	60	.750	.732
Simsim	80	85	.438	95	42	.442	86	39	.453	76	33	.434	30	22	.733	.500

Source: Planning Unit, MAF

A = Area in x1000 Ha

P = Production in x1000 MT

Y = Yield in MT per Ha

Source: Summarized from Planning Unit, Ministry of Agriculture

TABLE III.2

Estimated Food Crop Seed Market in Uganda  
All Crops Annual Sowings, Totals of 1st & 2nd Rains Plantings, Pure and Vined Stands

(1) Crop	(2) Area Planted (Hectares)	(3) Seeding Rate Pure Stand Kg/Ha	(4) Percent Sown in Mixed Stands	(5) Seeding Rate Mixed Stand Kg/Ha	(6) Total Seed Planted Tons	(7) Years Before Seed Renewal	(8) Total Annual Sales Tons	(9) Possible Retail Price US\$/Kg	(10) TOTAL VALUE Ug Shs
Maize	340,000	25	70	12	5,406	5	1081	25	27,025,000
Sorghum	158,000	8	46	6	1,120	5	224	21	47,040,000
F. Millet	350,000	8	48	6	2,464	7	352	25	8,800,000
Wheat	4,000	110	-	-	440	7	63	20	1,260,000
Rice	17,000	100	-	-	1,700	5	340	25	8,500,000
Groundnuts	180,000	100	56	70	14,980	3	5000	65	325,000,000
Beans	380,000	80	80	60	24,320	3	8000	50	400,000,000
Soye	11,000	40	-	-	440	3	150	60	9,000,000
Sesame	90,000	9	50	6	675	3	225	50	11,250,000
Sunflower	2,000	15	-	-	30	3	10	30	300,000
TOTAL	1,532,000				150,575		15,445		795,839,000

Notes: 1) Sorghum area reduced by 25% to allow for brewing varieties planted in Buganda, E. and W. Regions.  
2) Table shows 100% of theoretical seed sales.

Source: ICD estimate.

promotion was vigorous and nationwide. The introduction of hybrid varieties of maize, sorghum and sunflower would significantly expand the areas planted to these crops, and of course seed would need to be renewed each year. The increase in the factory processing capacity for soya beans and soya products should lead to a significant increase in crop acreage and seed demand.

C. Research System in the Public Sector

Uganda had a well managed, appropriately sized, and mission oriented agricultural food crop research program before political events practically destroyed it. There are three bases: one at the Kawanda Agricultural Research Station, located near Kampala, one at Serere, and one at Makerere University in the northeast. Fine research work in plant breeding was conducted. This is evidenced today in most of the crop varieties being grown in Uganda. Since 1960, the Kawanda Station has performed research on maize, beans, groundnuts and soya beans. The Serere Station was distinguished and world known for research on sorghum and millets. H. Doggett and others worked at Serere with local teams on sorghum and millets. After a period of collapse and abandonment, the Kawanda Station was rehabilitated in 1984. The Serere Station, while still in operation, is located in an area subject at present to threat of guerrilla action.

In addition to the two mission oriented research stations, a number of variety testing centers (VTC's) have been developed with the help of USAID. These are small farm centers scattered throughout the country where variety tests are located. Both the Agricultural Research Stations and the VTC's are under the administration of the Ministry of Agriculture. In addition, the Faculty of Agriculture of Makerere University has the research capability for basic studies at the graduate level. It may be used for research support in areas of important mission research of the Ministry of Agriculture, complementing the latter.

The Manpower for Agricultural Development Project (MFAD) of USAID in Uganda is in the process of developing a blueprint for a new agricultural research system. Through conversations with the mission led by Dr. William K. Gamble, it was evident that the new research organization would be developed with a sufficient degree of autonomy to allow it to do its job more efficiently.

We will review briefly the status of research, objectives, and potential advances in the short term of the research projects being undertaken at present by the respective crop commodity teams at both the Kawanda and



Serere Research Stations. These reviews are based on team assessments made on the basis of interviews with the respective teams. In general, our mission is under the impression that the research workers are well motivated, relatively well trained, although with limited experience in project design and coordination.

1. Maize

Two open-pollinated maize varieties, Kawanda Composite A and Kawanda Composite B, recognized with the short names KWCA and KWCB, were formed and released in 1971 and 1974, respectively. The first is a combination of East African maize lines, hybrids and varieties, while the second includes Latin American material and two East African varieties. The initial materials were genetically diverse, creating thus some variability which, inspite of selection, still shows up in the present versions of both composites. KWCA is the only one being commercially produced at present, with seed made available by the Uganda Seed Project. KWCA is a tall, late maturing white grained variety, susceptible to streak virus. This susceptibility is quite serious, as fields with up to 80% attack and gross yield reductions are found, especially with plantings made in the second season. An effort has been made to cross with materials from IITA which are streak-resistant. Results will not be available for at least two years, even though some streak-resistant selections are evident from the trials. A number of introductions from other countries will be tested for a minimum of 3 seasons leading to a restricted release of improved varieties after the third season. In the best of cases, with one season test at Kawanda, three season tests at VTC's, 1 to 2 seasons in farmer field trials, three years will be needed before a variety or hybrid is released.

The maize research team has very little information on how to breed hybrids and is very unlikely to obtain results leading to local maize hybrids in the short to medium term. In fact, from our perception, there is almost no activity in the areas of research that might lead to hybrid development. The maize research team is also negatively conditioned toward hybrids as a philosophy of maize breeding. For example, they negate the worth and extension of use of Kenya-originated maize hybrids. This point of view was not shared by some Ministry of Agriculture officers. Furthermore, Kenyan maize hybrids are widely accepted in a number of areas in Uganda.

The only factor which appears to impede the area expansion of hybrids in Uganda is the lack of local hybrids, and the problems in importing hybrids from outside the country. In the Karamoja province a different variety type is being planted. It is the Katumani Composite, which differs from KWCA in being earlier and better adapted to the lower rainfall conditions prevailing in northern Uganda. Kenya hybrids have done well in the north.

2. Beans

The research work on bean improvement started in 1960. With the collapse of bean research during the 1960s and 1970s, some of the varieties that had been selected continued to be planted by farmers but with saved seed. When research was resumed in 1984 some of the earlier breeders had to be located in order to recognize the ideotypes pertaining to specific varieties. The variety K-20 was recovered, and is being further recleaned from mixtures with local land races. This variety is susceptible to blight.

One of the important problems with beans is the prevalence of diseases, which are in some cases transmitted by seeds. Emphasis in research is on finding resistant sources and selecting them or crossing them to isolate resistance in commercially acceptable varieties. Another objective is the search for higher yield levels. Finally, preferences in taste, color, time of cooking and other quality factors will also be important.

With the help of CIAT, local collections are being made and introductions of various types of beans have proceeded. The African Bean Yield Trials (AFBYAN) have contributed materials. Similarly, genetic material derived from introductions from neighboring countries, especially Rwanda and Kenya are being studied and utilized in plant breeding. At present 11 selected accessions, including 4 checks, have been put into performance trials. These are planted on the VTC's for two consecutive seasons, followed by two seasons on farmers' fields before preliminary release.

These varieties have experienced limitations of seed availability and distribution. An experimental system of distribution, whose results are yet to be known, has been based on releasing seed to selected farmers, and having them distribute it to their neighbors, scaling the area of distribution progress and races started, as well as purification of recognizable varieties. The

high incidence of diseases being found produces a serious limitation to yields, even in well established varieties, such as K-20. A reconstituted K-20 is now available and could become a base for initial seed production. This and other varieties have been sent to CIAT for crossing and backcrossing with resistant materials. Hopefully, some of the land races and recent introductions from other African countries, could provide, in the short to medium term, new bean varieties. Two land races, Karnia and Mutlike, which underwent a backcrossing scheme have been returned, are in the F6 generation, and will be subjected to location performance trials. It is expected that foundation seed will be available in 1989 for some of the new varieties. Breeder seed production is continuing at present at the Uganda Seed Project in the standard K-20 variety.

The research base for the bean project is at Kawanda.

3. Millet and Sorghum

The millet and sorghum research started in 1958 at Serere and its base continues to be there. Both finger and pearl millets are included in the research. The finger millets are prevalent in the more humid regions, and form the majority of the millet area in the country. Sorghum is used mostly for brewing a local beer.

The objectives of the sorghum breeding program are agronomic adaptability yield, shoot fly, stem borer, leaf and mold disease resistances, grain quality and maturity. Similar objectives apply to millet research.

Varieties of sorghum released by the Serere Station are Serena and Seredo. Serena is a selection of a cross between Dobbs and a Swaziland type (P127), obtained before 1970. These are well adapted varieties with a range of use that transcends Uganda into neighboring countries. Sorghum hybrids Hijak, Hibred and Himida, were also obtained, with CK60 as a female parent. They exhibit at least 25% higher yields than the varieties, but their seed production has not proven easy and therefore no seed of hybrids is available.

Finger millet varieties Serere I, Engenyi and Gulu E have been obtained, as well as Pearl Millet Serere Composite 1 and Serere Composite 2, through successive generations.

#### 4. Soya Beans

Soya beans grow well in Uganda. This crop has had fluctuating fortunes of production, its area swelling or decreasing with periods of promotion and demand or periods of indifference of consumers, respectively. The original research started at Makerere University had both basic and applied dimensions. Research is now solely basic. Some of the varieties identified, selected, and named in Uganda are Composite Congo 72, Kabanyolo 1, S-38, and Bukalasa-4.

The research objectives are yield, maturity, adaptability and disease resistance. Testing is to be conducted at the seven testing centers for up to 5 seasons, before a variety is recommended for release. Through USAID several hundred breeding lines and varieties have been introduced from Intsoy and from IITA. These will have to undergo screening tests for several seasons. At present, only 8 varieties and breeding lines are in advanced tests.

One of the main problems hampering the development of the soya bean program is the short life of soya bean seed. Its viability deteriorates quickly in tropical climates, where no special facilities exist for creating artificial climates suitable for its preservation of its viability over extended periods of time.

#### 5. Groundnuts

A vigorous program on groundnuts was carried out at the Serere Station. It is being continued with new impetus. Varieties that were introduced in the past were Roxo and Red Beauty. The latter is the only one being maintained at present. Other varieties have deteriorated or have been lost. A program for collection of groundnut land races has been launched in order to expand the genetic base for further plant breeding research.

#### D. Varietal Introduction and Development

The rate of production of new varieties in Uganda is proceeding at a very slow pace. Main efforts at this time are to recover varieties which were mixed during the years of absence of research and variety maintenance. This situation creates an urgency for the introduction of new varieties from various sources, including national research, international research and private organizations in Uganda. While most of the introductions could be facilitated by the support of organizations such as USAID and the International

Crop Research Centers, the private sector materials could be allowed to flow into the research pipeline through appropriate means and incentives.

Excellent sources of materials are being tapped at present. These are already supplying important material for both testing and development of new varieties. We notice, however, a seemingly uneven proportion of introductions between the various crop programs, which may result in differential intensities of research. Another problem is that for some crops, especially sorghum and millets, the contacts and introductions of new materials seem to be relatively behind. Some of the newer varieties or lines from other countries do not appear to be present in the testing programs. This may be because the research on sorghum and millets is separated from the Ministry of Agriculture. These crops were the subject of the Tri-Country (Tanzania, Kenya, Uganda) Research Project. When the Tri-Country union split, the continuing agency changed.

The participation of private sector research with hybrid materials, such as maize, sorghum, sunflower and vegetables, should be encouraged and organized through the agricultural research system.

It appears unlikely that the rate of research will ensure the availability of new, high yielding varieties in the time period required to support a thriving seed industry. It may be necessary to accelerate the pace of development, especially testing, and to develop a system of early, provisional release. Such test areas will be small to minimize the risk of performance. This will be a challenge and a demand placed on the Ministry of Agriculture research.

At the same time, the Uganda seed industry should never be exposed to lack of new improved varieties. It may have to develop its own back-up activity of private research to insure that the appropriate varieties and hybrids are available. In view of the performance of many public research systems, it is not strange that the private sector may have to move into research. They need to recognize good genetic materials and varieties, and develop them into large scale seed production.

The public and private research systems in Uganda must learn to coexist and collaborate with each other. In the areas of information and joint testing, as well as analysis and application of results, joint activities are possible. The private research system may have better opportunities in tapping private sector materials, while the public research system may be more adept at obtaining basic collections of germplasm and public materials.

### E. Variety Testing and Registration

Variety testing in Uganda is conducted in an organized manner, and with the support of the seven Variety Testing Centers (VTC's) located throughout the country, a concept supported and financed by USAID. Varieties are submitted for testing with an appropriate number of checks, and the results are assembled, analyzed, and interpreted at Kawanda by the Coordinators and members of each of the main crop commodity programs.

It is important to conduct a sufficiently large series of tests in terms of number of locations, within the predicted areas of diffusion of a given crop or variety, and in a minimum number of representative seasons. The testing program is important in screening preliminary varieties with serious defects or that lack resistance to diseases or pests, have weak roots or stalks, poor productivity potential, or lack certain minimum quality attributes. After this initial stage, competitive trials of a large number of entries locate the outstanding varieties for advanced trials. Ultimately the best varieties should be sent to farmers' fields for on-farm performance trials. If in these series of tests, starting especially at the advanced trials, the potential selectable variety performs noticeably better or is superior in certain specific attributes, delaying decisions on farmer testing, and a potential pre-release decision might unnecessarily delay the benefits of new varieties to farmers. If the score in key factors in the potentially new variety is higher than standard checks, it is unreasonable to delay their release or registration. Therefore, an early approval philosophy should be adopted. When such a program has been adopted, considerable gains have been obtained in young breeding programs in developing countries. Long term testing primarily detects smaller differences which are to be expected in more mature programs. This is not the case in developing countries and no rational reason exists for delaying release after sufficient indication of excellence is obtained for a given variety.

In testing, therefore, clear selective criteria should be established, and sufficiency of some good agronomic characteristics should be a positive selective criterion for release. Yield is usually positively associated with lateness under optimum environments, but negatively associated in drier (low rainfall) environments. Varieties should therefore be tested and selected for specific conditions, and care should be taken to put them in tests with their own maturity class and in environments where they may perform well.

No matter what indicators may be obtained in the field plot trials, an ultimate test for a variety rests with farmers. Farmers will ultimately need to test and they will finally decide what they will stay with. This means they should be given enough choice and freedom of selection. Preliminary testing to eliminate substandard materials should be the rule. Farmers then must be given access to new varieties to observe the field responses. These larger tests will reveal disease and pest incidence from parasite or inoculum pressure not likely to occur on smaller plots.

Testing should be conducted by the research programs at an early stage of screening and with preliminary evaluations. When final performance tests of advanced materials occur, both the Ministry of Agriculture programs and the proposed private programs of seed firms should be allowed their independent evaluations. The results of their tests should be coordinated and validated.

Public varieties may undergo a release procedure for which an appropriate committee should make its decisions. Private varieties and hybrids after evaluation should be registered with the appropriate agency in the National Seed Authority. They are released internally by the seed company, according to their own rules and philosophy, so that no decision from the government agency is required in these cases. The National Seed Authority may deny registration only if it is proven that the proposed variety or hybrid has negative characteristics, and that its observed performance may be detrimental to the farmers' interest if planted.

It is important to establish impartial testing, to facilitate the entrance of breeding material, and to simplify variety registration. These are critical considerations for private sector participation in the seed industry. Private seed companies sooner or later become engaged in not only using public research results but also in developing their own products. They should be encouraged, not hindered by top heavy regulations. This applies not only to developed countries but even more so to developing countries. Uganda will be no exception.

#### F. Seed Legislation

A modern Seed Law is needed not only to spell the rules under which the seed industry of Uganda is to develop and operate, but should also include the factors required to integrate a National Seed System. A National Seed System is the set of rules under which an assembly of institutions

operates, defining their functions and interrelationships. The objective of a good Seed Law is the provision of the appropriate conditions for the successful development of a seed industry, leading to the production, marketing and distribution of sufficient quantities of high quality seed of improved varieties.

In no way shall a Seed Law be an anachronism based on the codification of a systematic series of threatening articles designed to police and punish an industry accused "a priori" of immoral actions. Rather, a modern Seed Law should organize, present, encourage, control firmly and assist the development of a private seed industry.

The Seed Law may or may not be expanded to include propagation material other than botanical seeds. The creation of a National Seed Administration would be made on the present base of the Uganda Seed Project. It is envisioned that the seed production functions of the USP would be transferred to the private sector. The NSA would retain foundation seed production, insofar as it would provide the seed from the public and private sectors.

A Seed Law should, above all, be promotional rather than put the emphasis on police actions. It should be simple, contain articulated basic requirements, and provide a skeletal framework on which to build a body of regulations. These regulations may be altered as the dynamics of the process require by the authority of the Ministry of Agriculture in consultation with a National Seed Council, an advisory body created by the Law.

Components of the Seed Law should be:

1. A statement of the objectives of the Seed Law as a philosophical foundation for its reason of being.
2. A statement of the administrative and functional components of a National Seed System for Uganda, and their interrelationship.
3. The National Seed Administration, its structure and organization, with departments or divisions in the following areas: a) Administrative and Promotional Division, b) Foundation Seed Production Division, c) Seed Certification and Registration Division, and d) Quality Control and Laboratories Division.
4. The National Seed Council and its functions.
5. Incentives for the private seed sector.



6. National Seed Industry Association representation.
7. Seed introduction, research, testing and variety release and registration.
8. Varietal protection.
9. Seed quality control.
10. Seed certification.
11. Seed marketing.
12. Seed import and export.
13. Phytosanitary and quarantine.

The Seed Law at present is only a draft, but the draft the ICD team saw was not, in our opinion, conducive to developing the appropriate blueprint for a sound National Seed Plan. First, it is incomplete. Second, it is obsolete in the sense that it is exhaustively repetitive of the types of laws which have proven to be incoherent and insufficient, if not outright obstructionist, to seed industry development in other countries. A more complete analysis of the project is presented in Appendix E.

The new seed law should be fairly well discussed and a consensus should be reached before adopting it. The law should be clear enough and unambiguous in its objective, the goals it seeks to achieve, organization limitations and rights of the public and private sectors, as well as incentives and disincentives. The model seed law of Peru of 1978 is an excellent example of such a structured law. In addition to local input, it had considerable advice from U.S. sources, the CIAT Seed Unit, and European advisers. The whole philosophy of such a law is promotional. A copy is included in Appendix F.

G. Investment Legislation

The proposed Uganda Seed Company will need to operate within the environment established by current investment legislation, potential revisions to that legislation, and the economic environment which affects the implementation of regulations, since implementation can often be at variance with the intent of the law. For investment to take place you need, among other things:

1. Guarantees for property rights.
2. Guarantees for rights to transfer profits and dividends.
3. An employment policy toward expatriates.
4. Export and import licensing policies.
5. Reasonable tax structure.
6. Adequate infrastructure.
7. Markets.
8. Political and economic stability.

The current and proposed investment laws of Uganda address primarily 1 through 5.

At present, investments are governed by the 1964 Foreign Investment Law and the 1977 Foreign Investment Decree. The 1964 Law guarantees against compulsory acquisition (by the government) without fair and prompt compensation, and also guarantees transfer out of the country of approved currency. The law, however, does not specify any priority areas for foreign exchange and leaves decisions to the Minister of Finance. The 1977 Foreign Investment Decree (by Idi Amin) provides tax incentives by establishing selected exemptions from payment of duty and sales taxes and exemption from payment of corporate taxes until 50% of capital investment is recouped. Currently, a Foreign Investment Protection Act is being considered as a replacement for the 1964 Law and the 1977 Decree. As briefed by the Permanent Secretary for the Ministry of Industry and Technology, there are a number of features being considered:

1. In order to cut down red tape one point will be established to deal with applications, etc., for

investments. At the moment, import and export licensing can be extremely time consuming.

2. Remittances from investments can be taken out of the country for a guaranteed period of twelve months.
3. Experts and advisors from other countries will be allowed into the country early.
4. Tax holidays are being debated.

In addition, the Foreign Investment Protection Act would establish three categories affecting government participation or shares in proposed companies.

- A. Situations described as strategically important which require 100% government ownership. One example of such a situation was large foreign exchange conserving or generating companies.
- B. The second category was considered to be essential production with large profit potential or where large investments already exist. These situations would require some sort of joint venture. (An initial reaction by the Permanent Secretary indicated that he thought the government might consider a seed company as so essential that even a majority (51%) share might be required by the Government of Uganda. Further comments indicated some flexibility.)
- C. This category included areas where no government involvement was needed or where the government might divest itself of activities to end duplication of activities, etc.

Further comments by the Permanent Secretary indicated that there would likely be zero duty on required capital equipment and a small duty on raw materials imported by the proposed Uganda Seed Company.

The stated goal of the Government of Uganda as evidenced by comments in the Background to the Budget, 1987 to 1988, is to create "a congenial climate for investment." In order to accomplish that goal, the Government of Uganda, through continued economic stabilization policies, will need to increase the availability of foreign exchange, and establish foreign exchange priorities which will encourage foreign investment. For long term production investments, such as the Uganda Seed Company, the ability to get and eventually remit foreign exchange will be critical.

H. Seed Quality Control and Certification

1. General

In an ideal situation, private and parastatal seed companies work closely with official seed certification agencies to produce high quality seed. The farmer buys this seed secure in the knowledge that it is of high physical purity, free from weed seeds, of high germination, and is not infected with seed borne diseases. He also knows that the plants produced will conform closely to the variety description. The main operations of this procedure, and the duties of the personnel concerned, are set out below:

	Seed Co. <u>Staff</u>	Cert.Agen. <u>Staff</u>
Field to be planted should be free from seeds of the same crop, harmful weeds or disease organisms	Ensure	Check
Parental seed planted of the correct grade or generation	Ensure	Check
Growing crop inspected several times before harvest to advise contract grower on roguing of off-types, and removal of weeds and diseased plants	Advise	Advise
Rejection of crop before harvest if field standards are not observed	--	Ensure
After harvest, see that only seed from the inspected field is sent to the company	Ensure	Check
Before acceptance, check that seed meets the required standards of physical purity, germination and freedom from disease	Check	--
Ensure that numbered certification labels are only attached to packed seeds from inspected field	Ensure	Check
Periodically sample seed packs in retail stores to check germination quality	--	Ensure

It is evident that seed certification agency staff need to have adequate qualifications to be energetic persons of integrity, and to have adequate transport and testing equipment to carry out field inspections and laboratory tests. Seed company staff similarly need to know all the

certification procedures to recruit competent contract growers and advise them through the life of the seed crop.

## 2. The Present Situation in Uganda

This is not satisfactory as far as the operation of an independent, impartial seed certification agency is concerned. The present senior Certification Officer is well qualified and experienced, having been with Uganda Seeds since 1971. There is an Inspection Officer at Masindi, and an Assistant Inspector at Masindi and another at Kawanda. These should be sufficient to examine all existing seed production at Kisindi and by contract growers if they have sufficient transport. But the National Seed Testing Laboratory at Kawanda is out of action, with no equipment of any kind. Some equipment is stored at Entebbe: the rest has been destroyed or stolen. It is hoped that in 1988 this laboratory will be working normally again. The only testing is carried out by the Uganda Project in a small, modestly equipped laboratory at Masindi. This is adequate for a company but not for an Official Agency.

There is no separation between the Uganda Seed Project staff--who are Field Inspectors and Laboratory Technicians for the seed production side--and those whose job should be to uphold with impartiality the National Uganda Seed Certification standards.

### I. The Cooperative System of Uganda

The basic cooperative organization in Uganda is the primary society. Any ten persons can form a primary society for legitimate purposes. Presently there are over 3000 registered primary cooperative societies. Most are engaged in the marketing of agricultural products including coffee, cotton, tea, cattle and fish.

For administrative purposes, Uganda is subdivided into 33 districts. In each district primary cooperatives have joined to form a District Cooperative Union whose purpose is to transport, market and process the produce that members deliver to their primary societies. For example, the Masaka Cooperative Union claims a one million person affiliation. The District Unions are under the management of a policy committee, the nine members of which serve three-year terms and must then be replaced. At District annual meetings, each primary society is represented by one or two persons depending upon size of membership. Each representative is permitted one vote.

The 33 District Unions are served by six national cooperative organizations. These include:

1. Uganda Cooperative Central Union, Ltd. (UCCU) - bulk suppliers of farm and industrial materials to members.
2. Uganda Cooperative Transport Union, Ltd. - provide transport facilities, vehicles and accessories to the cooperative movement.
3. Uganda Cooperative Wholesale Society, Ltd. - bulk suppliers to consumer primary societies.
4. Uganda Cooperative Savings and Credit - mobilizing members savings and creating convenient terms of credit.
5. The Cooperative Bank, Ltd. - banking and credit facilities to growers through unions and primary societies.
6. The Insurance Society of Uganda - carries out insurance activities for the cooperative movement.

A cooperative "apex" body, the Uganda Cooperative Alliance (UCA), is responsible for preparing and providing educational materials for primary societies and their members. UCA also serves as an advocate for Uganda's cooperatives with respect to government, other local parties and internal bodies. (Bureau for Africa, AID, 1984.)

As with many if not all institutions in Uganda, the cooperative movement has had many problems as a result of the Amin regime and the civil wars which followed. Still, the cooperative movement is likely to be a major force in the economic development of Uganda. Marketing cooperatives will play an increasingly important role if the government goals of expanding exports of maize, beans, soya beans, simsim and groundnuts is to succeed. For this to occur, the structure and infrastructure for the primary societies and unions will need to be strengthened. This includes supplies, transport, spare parts, etc. Financially, the coops will require better crop financing support so that payments for crops are made in a timely manner. Often coops sell to marketing boards who have been as late as two years in making payment. This partially led to the rapid decline in cotton and coffee produced or marketed officially.

Government regulation of prices can also impede improvement. When inputs are supplied through the UCCU to District Unions and, hence, to primary societies and members, the "allowable" mark-up decreases significantly as you move down the marketing chain.

Primary societies get as little as 5 or 10% commission

while the UCCU may get 30% commission. While this issue is dealt with elsewhere in this report, it should be noted the "service" attitude surrounding the cooperatives will hinder the value of coops as a business enterprise. Ultimately, this could hurt their contribution to either the business of a Uganda Seed Company or their likely role as an important marketer of the USC products.

There is also concern about the strong government role in the cooperative movement. While this power (especially by the Ministry of Cooperatives and Marketing) has evolved slowly, and reforms are being considered to lessen government involvement, the cooperatives seem unduly influenced by the government. This has led to ambiguities within the Government of Uganda as to whether the UCCU, for example, is a government or a private agency.

J. Seed Marketing and Distribution

The present system of seed marketing and distribution in Uganda is circumscribed to the regional Agricultural Cooperatives, working in cooperation with the UCCU in Kampala. This system is balanced by a presumably large number of intermediaries who buy and sell seed privately, including farmers, farmers-merchants, and merchants.

UCCU markets seeds from several sources:

1. Uganda Seed Project seed which is sold at a theoretical mark-up requested by the USP of 5%, but which in reality comes to a 30% mark-up.
2. Hybrid maize seed imported from the Kenya Seed Co. Seed was imported in 1986, but during 1987 the government of Kenya did not provide licenses to export hybrid maize seed to Uganda. The financing for the importation of hybrid maize seed from Kenya came from USAID.
3. Vegetable seed, imported with the financial support of USAID from the U.S.A.

The Cooperative Unions and District Cooperatives are the key elements of the Cooperative seeds marketing channel. They receive requests from their members for specific quantities of seed, which are then added, and the seed is requested from the UCCU or from the Ugandan Seed Project, up to the limit of credit or the funds available for purchase. Less than half the seed that goes in the marketing channels moves through this system. Another half moves through the Ministry of Agriculture direct sales and distribution efforts, through other agencies, relief, and other wise and

through private merchants. The real volume of seed moved through merchants is unknown. We had evidence, however, directly from the Ministry of Agriculture that in certain areas their contribution to distribution of smuggled seed of Kenya maize hybrids and other seeds was quite important. Nevertheless, more than 90% of the farmers of Uganda do not have access to new seed.

The present marketing system has serious constraints, and the situation is unlikely to change, unless more agility, modern marketing mechanisms, new varieties, better quality seed, appropriate pricing and a chain of economic incentives are built into the marketing and distribution system.

#### K. Seed Pricing

The attitude of the Government of Uganda toward seed pricing will be a major factor determining the ability of the proposed Uganda Seed Company to operate profitably. To date, there has not been much experience with this issue since there has not been a great deal of product. Because the Uganda Seed Project is operated as a unit of the Ministry of Agriculture, its prices do not reflect the full cost of production, especially administration. Seeds are marketed through the cooperative system or government agencies. Recent quantities have been very small and primarily marketed by cooperatives around Masindi.

Perhaps a better current indication of seed price policy is the Church of Uganda Karamoja Seed Scheme. Their prices are not controlled. Table III.3 demonstrates the prices paid to growers and the prices then charged as an across-the-board increment. Reactions by government agencies acquiring seeds from the Karamoja Scheme are that the price of seeds is too high. Nevertheless, Karamoja is able to establish their own prices. Whether prices are too high or could be even higher cannot be determined since most purchasers of Karamoja seeds are institutions, not farmers.

Finally, comments by some individuals in the field indicate a high demand for smuggled maize hybrids from Kenya. Prices paid for that seed are seven to ten times the price paid for grain. One could anticipate that price controls on maize produced in Uganda could alternatively find better prices in other countries.

#### L. Credit for Agricultural Inputs

When improved seeds and other higher technology agricultural inputs become available (or as a condition to their adoption) there will need to be greater access to



## Karamoja Seed Scheme, Church of Uganda

## Prices Paid to Growers\* 1987

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	Growers Near	Growers Far
Maize	25	21
Sorghum	25	21
Groundnuts (unshelled)	60	50
F. Millet	30	--
B. Millet	30	--
Sunflower	30	--
Cowpeas	35	21
Lab-Lab Beans	35	--

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\* Add 17 to all prices to arrive at selling price.

Source: Karamoja Seed Scheme

production credit. At present, agriculture gets a large share of the commercial credit available in Uganda. Within agriculture, as shown in Table III.4, processing and marketing, primarily 90% for coffee, vastly exceeds production credit. Most production credit was for livestock activities. According to the Ronco (1987) analysis of Uganda Commercial Bank (UCB) and Grindlay's Bank, "The total number of farms provided with production credit has been so small as to be insignificant-- e. g., in most years less than 100 applications. Commonly, only a dozen or fewer loans were made in a given year for a particular purpose compared with 2 million or more farm families in Uganda." (p. 107)

The credit institutions serving agriculture, especially for production credit, are very weak. While donor assistance may ameliorate the situation, those problems will take time to address. Some efforts, especially by USAID, are addressing the credit needs of cooperatives. Recent trends in the allocation of credit within agriculture show a movement away from credit to cooperatives and toward the marketing boards. Well known difficulties by cooperatives in paying farmers in a timely manner will be exacerbated by this trend.

Within this context, "this reflects an increase in purchases by marketing boards to cooperatives because cooperatives were not considered creditworthy by banks. Provision of guarantees to cooperatives has been an increasing practice of CMB (Coffee Marketing Board) and LMB (Lint Marketing Board). However, UCCU has become a major creditor of the PMB which has delayed payment for goods received, especially bags." (Ronco, 1987, p. 106) Furthermore, the Cooperative Bank of Uganda is essentially bankrupt.

Other institutional problems were mentioned earlier. For example, the lack of leaseholds limits the small farmer from using land as collateral. Partially as an experiment to address this, the EEC and USAID in cooperation with the Bank of Uganda will establish a pilot project of non-collateral credit, offered at commercial rates. Otherwise, there seems to be little effective effort to mobilize rural capital and credit.

Finally, a point made by others would be reiterated here. While "it is clear that there currently is no credit institution serving farmers effectively with either investment or annual product credit," and "the small amount of credit available goes mainly to larger farmers and those able to offer good security," availability of credit, given the low input-output subsistence farming, will not be as important as ensuring fair product prices and prompt payment

TABLE III.4  
Commercial Banks Loan and Advances to the Private Sector  
By Type 1983-1986

BROAD SECTOR	1983				1984				1985				1986			
	MARCH	JUNE	SEPT	DEC	MARCH	JUNE	SEPT	DEC	MARCH	JUNE	SEPT	DEC	MARCH	JUNE	SEPT	DEC
VALUE (Shs Billion)																
Agriculture of which	10.18	9.62	5.20	7.54	10.49	10.85	8.72	14.25	15.27	38.59	42.89	46.26	105.56	120.13	119.51	181.79
Crop finance	3.73	7.72	4.22	5.60	9.27	9.53	7.24	11.22	12.41	28.04	40.68	42.50	76.23	110.97	109.17	162.91
Trade & Commerce	5.45	5.60	6.52	10.07	3.57	10.26	12.00	10.58	14.91	15.54	19.11	20.76	29.86	29.04	32.05	47.87
Manufacturing	2.59	4.45	3.52	5.53	5.81	3.00	2.22	10.48	13.95	15.05	15.21	17.55	19.00	18.93	25.32	33.54
Transportation	2.34	2.40	2.44	2.20	3.25	2.54	2.14	2.74	2.74	5.42	4.02	4.19	4.15	6.17	3.75	8.25
Building & Construction	0.55	0.48	0.66	0.34	0.50	0.33	1.24	1.54	1.76	2.09	1.52	4.28	4.15	6.17	3.75	8.25
Others (including balancing items)	0.11	0.02	0.50	1.59	0.92	1.05	1.54	1.29	1.64	4.22	2.41	2.15	1.79	4.00	6.11	7.97
TOTAL	22.71	22.87	20.67	28.47	31.43	32.87	32.17	45.15	52.99	80.43	85.32	94.21	162.90	180.07	180.32	209.49
PERCENTAGE CONTRIBUTION																
Agriculture of which	46.25	42.16	25.16	26.47	39.28	32.17	26.95	31.56	48.72	49.11	53.27	51.16	64.76	66.71	61.82	84.82
Crop finance	16.89	33.78	20.42	22.18	29.49	28.99	22.16	24.88	45.73	47.30	47.91	44.90	59.07	61.65	58.42	80.69
Trade & Commerce	24.76	25.60	41.22	34.75	30.45	31.21	36.40	23.27	28.43	19.32	22.40	21.61	12.81	16.13	16.58	17.07
Manufacturing	12.22	19.46	16.96	19.19	18.50	18.25	11.79	23.92	19.08	18.71	17.63	18.63	11.66	10.51	13.55	11.96
Transportation	10.27	10.49	11.80	11.29	11.87	8.74	6.46	6.10	7.51	5.01	4.50	4.52	2.55	3.43	4.52	2.94
Building & Construction	2.50	2.10	3.17	1.20	1.55	1.63	3.74	3.33	2.41	2.60	1.78	2.36	1.10	2.32	3.15	2.84
Others (including balancing items)	0.59	0.09	2.56	5.49	2.76	5.63	4.65	4.75	3.25	5.25	2.82	1.82	7.12	1.90	6.57	0.56
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source - Bank of Uganda

where either parastatals or cooperatives are concerned.

When better seed varieties become available and complementary technological packages are adopted, then credit needs will increase. That credit should be available at market-determined commercial rates, not subsidized rates.

M. Food Crop Commodity Pricing and Marketing

Food crops have historically received very little government attention as compared to the traditional export crops such as coffee and cotton. But the government has always been involved in commodity pricing, and has recently become more active in food crop pricing. Often the government has set prices at low levels, then pocketed the profits which go into the general revenue fund. While the present administration has recognized the negative incentives given to producers, the loss of revenues resulting from increased producer prices presents the government with severe budgetary problems, especially in the short term when production cannot quickly respond to price incentives. High rates of inflation and overvalued currency have also complicated pricing policies. The present government has recognized these problems and, as part of the May 1987 policy changes, significantly raised real producer prices. One estimate indicates that prices were increased by an average of 599% for food crops (Sands, 1987). Inflation has eroded some of this gain, and further price increases required by government action are in the correct direction. However, complaints of excessively low prices still persist. For example, it is perceived by some Ugandans that the price paid to farmers for coffee is 21% of its true market value.

Prices for food crops are set by an agriculture Policy Committee advised by the Agricultural Secretariat within the Bank of Uganda. Members of the committee include, among others, the Ministries of Agriculture, Coops, Finance, Planning and Commerce. Meetings are held every 3 to 6 months. Prices set are based on the cost of production for each crop as shown in Table III.5 (maize, beans, groundnuts, simsim, soya beans) and summarized in Table III.6 for 1987-88.

Food crops prices are applicable to purchases of the parastatal Produce Marketing Board (PMB). While the PMB does not take a very active role in either buying or selling food crops, it can have a dampening effect on prices. The PMB indirectly influences farm gate prices by the prices they offer marketing agents at their buying centers. PMB's prices are perceived maximum prices, and not the minimum prices they are named. This is a problem if exports of food

TABLE III.5

Cost of Production for Food Crops per Hectare  
(1987 Old Ush)

NO. COST COMPONENTS	MAIZE		BEANS		GROUNDNUTS		SOYBEANS		SIMSIM	
	Phys.	Financial:	Phys.	Financial:	Phys.	Financial:	Phys.	Financial:	Phys.	Financial:
	ManDays	Ug. Sh.	ManDays	Ug. Sh.	ManDays	Ug. Sh.	ManDays	Ug. Sh.	ManDays	Ug. Sh.
1. Land Clearing/Slashing	20 MD	20,000	10 MD	10,000	12 MD	12,000	10 MD	10,000	30 MD	30,000
2. Land Preparation	40 MD	40,000	30 MD	30,000	30 MD	30,000	30 MD	30,000	30 MD	30,000
3. Seeds	30 MD	15,000	50 MD	30,000	100 Kg	100,000	60 Kg	24,000	10 Kg	15,000
4. Planting Seeds	5 MD	5,000	10 MD	10,000	-	-	10 MD	10,000	10 MD	10,000
5. Fertilizers/Manure	-	-	-	-	-	-	-	-	-	-
6. Application of Fertilizers/Manure	-	-	-	-	-	-	-	-	-	-
7. Pesticides/Insecticides	-	-	-	-	2.5 L	22,000	-	-	-	-
8. Spraying	-	-	-	-	8 MD	8,000	-	-	-	-
9. Weeding/Thinning	80 MD	80,000	80 MD	80,000	120 MD	120,000	80 MD	80,000	110 MD	110,000
10. Harvesting	25 MD	25,000	20 MD	-	-	-	-	-	-	-
11. Post Harvesting: Thrash/Sort, etc.	20 MD	20,000	10 MD	10,000	20 MD	20,000	10 MD	10,000	20 MD	20,000
12. *Transportation/Marketing	13 bags	3,500	8 bags	4,000	9 bags	4,500	11 bags	5,500	4 bags	2,000
13. *Depreciation of Equipment	-	8,000	-	8,000	-	8,000	-	8,000	-	8,000
14. Interest Charges	-	-	-	-	-	-	-	-	-	-
15. Gunny Bags @ Ug. Sh. - /Two Seasons	13 bags	13,000	8 bags	8,000	9 bags	9,000	11 bags	11,000	4 bags	4,000
16. Sub-Total Mandays/Cost	190 MD	232,500	160 MD	210,000	240 MD	383,500	160 MD	208,500	230 MD	259,000
17. Price/Physical Contingency @ 50%	-	116,250	-	105,000	-	191,750	-	104,250	-	129,500
18. TOTAL COST OF PRODUCTION	-	348,750	-	315,000	-	575,250	-	312,750	-	388,500
19. YIELD	1200 Kg	-	700 Kg	-	800 Kg	-	1000 Kg	-	500 Kg	-
20. Cost Production/Kg w/out Profit Margin	-	290	-	450	-	719	-	313	-	970
21. Cost Production/Kg w/ 25% Margin	-	360	-	562	-	899	-	390	-	1,210
22. Producer Price Adjusted	-	360	-	550	-	900	-	450	-	1,200
23.				Producer Price (Mixed Colored) 440		(Shelled) 1,500				

\* 75% Foreign Cost

Source: Agricultural Secretariat

TABLE III.6

**Cost of Production and Computation of Minimum Producer Prices  
1987-1988 (Old USh)**

Commodities	Costs of Inputs	Labour Requirements	Costs of Labour	Other Costs	Total Costs of Production	Yield	Costs of Production/Kg	Minimum Producer Price
	USh/Ha	MD/Ha	USh/Ha	USh/Ha	USh/Ha	Kg/Ha	USh/Kg	USh/Kg
Maize	72,000	190	665,000	-	737,000	1,200	614	600
Beans (one colour)	106,000	179	626,500	-	732,500	700	1,046	1,000
Groundnuts (unshelled)	474,600	250	875,000	-	1,349,600	800	1,687	1,700
Soya Beans	63,000	185	647,500	-	710,500	1,000	710	700
Sim Sim	76,000	190	665,000	-	741,000	400	1,852	1,900

Includes amortization of rehabilitation costs, etc.

Labour cost is imputed based on opportunity cost/return in competing crops.

Source: Agricultural Secretariat

crops are going to occur. Prices as of October 1987 are shown in Table III.7. Presently, home consumption and local market sales account for around 90% of food crop production with less than 10% entering the market for urban consumption. Little is officially exported.

The PMB has official monopoly control over exports of the five food crops listed. Under the present government, in August 1986, the PMB also had monopoly control over domestic marketing. This was quickly rescinded because of PMB's inability to handle this charge. The PMB and its system of licensed agents serves the interests of broader government policy without considering the consequences on growers and, hence, on production of its activities. If the pattern established by other marketing boards prevails, the system will not provide producers with incentives nor Uganda with exports.

## Central Depot Prices, Produce Marketing Board

October 1987

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	Minimum Price USh/Kilo	Maximum Price USh/Kilo
White Maize	6.	12.
One Color Beans	14.	20.
Mixed Beans	7.80	14.
Groundnuts (shelled)	28.	36.
Sim Sim	25.	32.
Soya	7.	20.

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Source: Produce Marketing Board



#### IV. ORGANIZATION AND DEVELOPMENT OF A NATIONAL SEED COMPANY

##### A. The Need for a National Seed Industry

Seed programs and national seed industries constitute an important element for successful agricultural development policies. The goal of such activities is to provide a supply of a high yield input with which to increase agricultural production. Other goals include reducing the risk of crop failure and improving the quality of crops. It is also expected that high quality seeds of improved varieties will be catalytic to increased crop production. However, a national seed industry in Uganda cannot be isolated from other interdependent aspects of the national and agricultural economies.

An integrated approach to agricultural development is recommended in conjunction with the launching of a seed program. The goal of a seed program should be development of a seed system, including a Uganda Seed Company, with complementary support functions between public and private sectors, as well as simultaneous improvements in areas such as cooperatives, marketing, transportation, extension, credit and crop utilization. As a consequence, the agricultural system should be much more productive and efficient.

Uganda needs a national seed industry to be able to channel the recently re-established foundation seed production capability through the Uganda Seeds Project. But, when the Uganda Seed Company becomes fully operational, the requirements for foundation seed may be many times current production. This, again, emphasizes integrated and complementary growth among different elements of the seed production system.

##### B. Present Constraints and Limitations

The constraints and limitations to the establishment of a Uganda Seed Company (predicated upon substantial involvement of the private sector) will need to be considered by all the decisionmakers in the process. A partial listing follows:

- o The past record of the Government of Uganda in dealing with foreign investors, including expropriation and product price controls.
- o The macro-economic environment, especially the economic and fiscal policies contributing to inflation, overvalued currency and foreign exchange scarcity.

- o The generally low and in some cases deteriorated state of the economy, especially the crucial agricultural sector.
- o The appearance of a lack of coordination of policies in the seed subsector, particularly in regard to donor supported projects by EEC, GTZ and USAID.
- o Lack of a "promotional" seed law that clearly defines the rules of the game for all participants including potential seed industry investors.
- o Government interference in private sector product pricing.
- o No clear guidelines concerning establishment and operation of new firms, including reasonable assurance against expropriation. Current trends to get the government out of previously expropriated firms should be continued.
- o Repatriation of profits is currently controlled by both statute and foreign exchange allocations.
- o The private sector is not adequately involved in advising the government on policies relating to the seed subsector.
- o Agricultural research is insufficient and slow. Without properly adapted seeds, i.e., a product, and the research institution to produce it, development of appropriate technology will be slow or negligible.
- o Limitations on the introduction of new germplasm for testing and eventual seed production. This will require guarantees to firms that develop germplasm that their proprietary rights will be honored. Otherwise, they will simply not import seeds into Uganda.
- o Small size and low income of farm units affect both production costs (of seed farming) and market size.
- o Poor infrastructure, especially the road network.
- o Reduced production incentives caused by government pricing policies for farm commodities.
- o Little or no credit available to farmers to purchase improved technologies.
- o Poor state of the institutions which support agriculture, including government agencies, cooperatives and banks.

While this is an extensive list of negative concerns, there are several positive factors which warrant special mention:

- o Good potential profit possibilities.
- o Good physical and climatic agricultural environment.
- o Positive farmer attitudes toward improved seeds evidenced by their past performance in adopting new seeds and technology compatible with their present equilibrium.
- o A willingness by the GOU to consider pragmatic policy changes.
- o The potential development of an impressive research system through the NARO proposal.
- o Relatively low prices for grain production.
- o Uniform environment which permits a small number of varieties to serve the market.
- o The constructive attitude and optimism of current participants in the seed system. After many years of hardship, they are energetic and enthusiastic toward rebuilding and expanding the institutions serving Ugandan farmers.
- o Uganda was the most developed East African country in the 1960's. The government has expressed a strong desire to regain that position.
- o Positive attitude of the donor community as evidenced by increasing aid contributions.

C. Optional Models for Development of the Seed Industry

At an early stage in the development of emerging countries, public administrators have felt the need for the development of a seed industry as an instrument, and a base on which to build agricultural development in their respective countries.

This has led, in the absence of private firms dealing with serious seed production, processing and distribution, to the government assuming this role. In the process of deciding to take the role of seed producers and

distributors, governments have requested the help of international aid agencies (UNDP, FAO, Regional Development Banks, the World Bank, and USAID), and have in most instances not only been helped by one or more of these agencies, but in some cases the initiative, encouragement and technical support and financing has originated in the aid agency.

The result has been that in some countries, such as in Uganda, a Government owned, directed, and operated seed agency has emerged, with a wide scope of activities.

This initial enterprise has been assimilated in many emerging countries as well as in Uganda into a de facto department of the Ministry of Agriculture. A Department of the Ministry of Agriculture has appointed staff and ultimately responds to the Minister of Agriculture through an intermediate hierarchy. It follows public administration rules and ways of doing business, and the dictates of the Ministry in terms of pricing policy. Its personnel are neither paid on the basis of individual performance nor are they rewarded with economic premiums or bonuses for having achieved or exceeded goals. Finally, it is not allowed to make profits, retain profits, build financial reserves, and apply them to enhance institutional worth and security. This is, to a greater or lesser extent, the case of the Uganda Seed Project.

This basic type of organization has functioned, and still functions in many developing countries. It invariably leads to failure, in the sense that it does not reach sensible goals by being self supporting, and providing a sufficient supply of high quality seed to meet national needs. There is absolutely no doubt that there is an early limit to growth in this type of organization, which has been found to be around 5% of the seed needs of a given country. Furthermore, it entails the use of scarce financial resources, it involves building a higher national public debt in hard currency, requires heavy subsidizing of seed costs, as many of these projects have been built on the false premise that good seeds ought to be cheap seeds, and have not been able to retain and motivate high quality personnel.

The concept of the Seeds Project, or Seeds Department of the Ministries of Agriculture in developing countries is now recognized as an obsolete concept. Many developing countries, after being confronted with the predictable outcome of the experiment have either abandoned the model

or turned to a higher level of organization.

The next highest level of organization, adopted by some countries unwilling to encourage the participation of a private sector or unable to find the cooperation for one reason or other, has been the creation of a parastatal seed company.

The parastatal seed company operates as a true corporation, to a greater or lesser extent, depending on the freedom of operation it is allowed by the executive and legislative branches of government, as well as by the Ministry of Economy or Finance and the National or Agricultural Planning Boards. When given enough freedom through an independent Board of Directors and a charter that allows the company to operate exactly as a private sector company, then a parastatal company might be successful. If such a company works for profit, then it imitates a private sector company, and the rationale for negating the presence of private companies in the seed business ceases to exist. When, on the other hand, the parastatal is subjected to a moderate to high level of policy control, experience has shown that moderate success ensues, which is followed later by accumulated losses that erode its capital structure and base, requiring constant propping up and supplementary funding from the government budget.

The parastatal seed company is not a viable solution where there is a semblance of a market in the agricultural sector. It may exist with success only in economies which are strictly centrally planned. These economies, however, require a large natural resource base, large capitalist and capitalistic accumulated resource, or else have to be supported from outside sources. Obviously, this is not the case with emerging countries.

The last model is the private seed industry model. In its perfect form it is non-monopolistic. It allows for market competition in the form of many varieties or hybrids submitted by the various companies to the market, by prices adjusting to some ratio to costs, and maintaining a certain acceptable percentage of profit that allows a fair return to capital and the work invested and the building of a capital fund reserve. Under conditions that allow a reasonable profit to occur on an average number of years, the incentives are built into the organization and among its personnel, to grow and expand in a sensible, sound manner and at a sufficiently fast rate. Profits are reinvested, if the incentives to do so are present.

In the case of Uganda, conditions may not be ripe for a fully competitive environment, with the participation of a number of companies, because of the previous political and economic history. We believe, however, that appropriate legislation and government support should be maintained to encourage a free market private seed industry to develop in Uganda.

Practically, however, at this time we visualize difficulties for a number of large companies to develop concurrently because the market may not support several companies with the minimum earnings required to operate. These difficulties reduce to the following limiting factors:

- a) Small market size.
- b) Fragmentation of property into very small landholdings.
- c) Low prices for agricultural commodities which limit investment of farmers in inputs.
- d) Lack of fertilizers, pesticides, and hard currency to buy them, thereby limiting the usefulness of seeds of varieties with higher yields.
- e) Insufficient credit availability and access.

In spite of these limitations, farmers may be willing to purchase high quality seeds of improved varieties at fair prices, as they see an advantage to their added income in their use.

The mission recommends, therefore, establishment and promotion of one seed company. This company would be registered as a Ugandan Corporation, and would establish shares to be purchased by private investors in a ratio of, for example, 80 percent to 20 percent of public institutional investment. This company would initially share the market with the Masaka Project (eventually taken over by a local cooperative) and with the Karamoja Seed Project, which has a regional interest. The Masaka Project activities could also eventually be absorbed by the USC. It is unlikely, but not impossible, that other specialized seed companies may appear in the future.

D. Recommendations Relative to the Development of a National Seed Company

The proposal of the development of a national private seed company, to be called tentatively the Uganda Seed Company (USC), is based on the dictates of ICD experience

with similar companies in a number of countries. Relative successes and failures have been observed, and carefully diagnosed. Reasons for success and failure are well known. In order to avoid the pitfalls that may bring about failure to the fledgling USC, a layout of the masterplan of this company should consider those elements that will positively contribute to the success of the company, and should clearly set aside and eliminate structural philosophies and components which may detract it from its objectives and the achievement of its goals.

1. Objectives of the Company

Private companies are more dynamic and more responsive to customer needs than state or parastatal enterprises. Their management looks to the successful performance and profitability of the Company for job satisfaction, promotion and other rewards. The Company would serve Uganda farmers by the provision of adequate supplies of good quality food crop seeds, in good time for planting and at reasonable prices.

The objectives of the Uganda Seed Company should be very clearly defined. The USC should devote its efforts to maximizing the output of high quality seed, through local production, followed by processing, storage, marketing and distribution, of varieties originating in its own, or related companies research, in public research done in Uganda, and in international research. The seed so produced and distributed, should be marketed at fair prices, stimulating its use by most farmers in Uganda, and allowing at the same time for a profitable operation, which would produce economic surpluses consistent with standards of the seed industry around the world.

The USC would start operations concentrating production, processing and marketing with those varieties of major crops that have been developed in the past and that are present now in the market, and foundation seed which is produced by the Uganda Seed Project. These are maize, sorghum, millets, beans, soya beans, and groundnuts. Initially open-pollinated or naturally self-pollinated varieties will be used. As soon as possible, and without much hesitation, hybrid versions proven to be higher yielding (in the range of 20% or more above varieties), should be introduced. Within the first five years of introduction hybrid seed sold should equal or exceed

the volumes of open-pollinated varieties, for those crops where adapted hybrids are available, exhibit good yield potential, and their seed production is economically sound.

The USC should strive for the highest possible supply of seed of improved varieties, compatible with two factors: (a) funding to build seed inventories based on availability of credit, and (b) capacity to market seeds based on product acceptance and farmers' motivation to purchase inputs with increased purchasing capacity. A scenario could be established in which the company develops a supply position which by the fourth or fifth year could be 10% of potential demand, and which could progressively grow to reach 15-20% of potential demand in 8-10 years. It should be explained that potential demand is the "total country potential demand." Since open-pollinated and self-pollinated varieties are normally replaced with new seed by farmers once every 5 years, the real "market demand" becomes 20% of the potential demand. Reaching a 10% of the "potential demand" means achieving 50% of "market demand," and 15% of the potential demand would mean 75% of market demand, which would indeed be impressive. For hybrid seed, the mission estimates that much higher percentages of the total demand could be met.

In addition, the secondary diffusion of seed of improved varieties on the basis of farmer to farmer trade and exchange would be very significant in promoting high yields. Secondary diffusion of these varieties could easily account for over 50% of potential demand in the first ten year period. It is estimated that in major crops planted by small farmers, 20% of the potential market could well be met, as farmers tend to save their own seed and purchase new seed only every five years. This, of course, may vary from crop to crop. Seed turnover, for example, may be on the order of 33% per year for rice.

As the experience of the company increases, it would expand its area of interest to vegetable, forage, and potato seed, and this has been tentatively included in Table IV.1, where some initial production is shown. Among the vegetable seeds likely to be produced in Uganda, although not immediately, are cucurbitacea, peppers, egg plant, and eventually some tomato seed. Among the forages, we foresee some tropical grazing grasses (Brachiarias, Guinea grass, Hyparrhenias,



TABLE IV.1

## Projected Seed Production and Gross Income for Uganda Seed Company

Crop	Price of Seed \$/Kg	1990		1992		1994		1996	
		Product MT	Value US\$	Product MT	Value US\$	Product MT	Value US\$	Product MT	Value US\$
Maize, vars.	.43	800	344,000	1,000	430,000	800	344,000	500	215,000
Maize, hybrids	1.00	300	300,000	500	500,000	700	700,000	1,000	1,000,000
Sorghum, vars.	.50	200	100,000	200	100,000	200	100,000	200	100,000
Sorghum, hyb.	1.50	200	300,000	300	450,000	400	600,000	500	750,000
Pearl millet, vars	.50	50	25,000	100	50,000	100	50,000	100	50,000
Pearl millet, hyb	1.50	20	30,000	100	150,000	150	225,000	200	300,000
Finger millet	.50	250	125,000	350	175,000	500	250,000	600	300,000
Wheat & Barley	.30	400	120,000	550	165,000	700	210,000	700	210,000
Beans	.40	500	200,000	1,000	400,000	1,750	700,000	2,500	1,000,000
Groundnuts	.80	300	240,000	700	560,000	1,100	880,000	1,500	1,200,000
Soybeans	.45	50	22,500	100	45,000	150	67,500	200	90,000
Sunflower	4.00	20	80,000	50	200,000	75	300,000	100	400,000
Sesame	.83	50	41,500	100	83,000	200	166,000	250	207,500
Vegetables	15.00	2	30,000	5	75,000	7	105,000	7	105,000
Potatoes	.25	100	25,000	100	25,000	200	175,000	1,000	250,000
Forage grasses	10.00	3	30,000	9	90,000	15	150,000	20	200,000
<b>Total (US\$)</b>		<b>3,245</b>	<b>2,013,000</b>	<b>5,164</b>	<b>3,478,000</b>	<b>7,547</b>	<b>5,022,500</b>	<b>9,377</b>	<b>6,377,500</b>
<b>Total USh (Ug. Sh.) x 100</b>			<b>1,207,800</b>		<b>2,098,000</b>		<b>3,013,500</b>		<b>3,826,500</b>

etc.), some grazing tropical legumes (Stylosanthes, Centrosema, etc.), and cut or silage grasses such as sorghum x sudan crosses, elephant grass x pearl millet crosses, Guatemala grass, etc.

The production of seeds of wheat, barley, and white grain sorghum of flour-milling and bread-making varieties or hybrids should be especially desirable, and would need to be worked out as project agreements with government and the respective industries. The same applies to oil crop seeds, especially hybrid sunflower, soya beans, and simsim (sesame).

At an early stage the USC should establish very strong financial and operational linkages with the cooperative system of Uganda, which should allow the latter to assume a very important role in the distribution of seeds to farmers, at a profit. It should also establish a parallel system of private dealers to supplement the cooperatives in seed marketing and distribution.

2. Shareholding and By-Laws of the Company

The Uganda Seed Company (USC) should be registered as a private corporation in accordance with the laws of Uganda. The mission proposes that approximately 80% of the shares be owned by a consortium of private investors specializing in tropical seed production and distribution, with expertise in each of the major crop seeds and areas in which Uganda has demonstrated potential demand. Shares could be held by one or more agribusiness companies with current operational experience and residence in Uganda. These shares could be held by Ugandan citizens, as well as by foreign firms established in Uganda. The remaining shares could be held by a publicly owned Ugandan bank or financial organization designated by the government. In view of imminent amendment of the Cooperative Act, aimed at making the cooperative system more private sector-oriented, and the new USAID Cooperative Agriculture and Agribusiness project, the cooperative system would likely become a minor shareholder of the company. The government may even wish that the cooperatives be represented on the company's board of directors.

The By-Laws of the USC should be drafted and decided upon by the shareholders. Only as a matter of reference does the mission provide, in Appendix D, a model draft offered by a Kampala law firm, which was modified to suit the case.

3. Financial and Asset Structure of the Company

The financial structure of a seed company requiring risk capital and a commitment to long term investment requires careful assessment, planning, and a certain minimum security by government. Even with government guarantees, outside financial security support may be needed to guarantee investors' assets and supplement the original risk capital.

The initial "seed capital" could come in one of three forms:

- a) An outright grant to pay for expenses associated with the expatriate management cost during the first three years of the company's existence.
- b) A long term loan for the original expense of bringing in expatriates, and for the purchase of equipment.
- c) A payment in local currency for importation of seeds, with a succeeding loan to be made in local currency for the local expenses, and partial payment in dollars to be applied as a loan for the dollar expenses indicated.

In addition to the risk capital brought in by investors, working capital might take the form of a loan from the African Development Bank or from the IFC/World Bank. The first loan would be made to the government for application to the seed project. The second loan would be made directly to the seed company.

It is difficult to recommend the use of reinforcing funds for the Uganda Cooperative System, which would directly involve the Cooperatives in management and ownership of the firm, because the present objectives of the seed company and those of the Cooperatives regarding transfer of profits are clearly at odds. In addition, the Cooperatives' management record is questionable. If, however, reform of the cooperative progresses as the GOU and USAID expect, such action would become more justifiable.

The financial requirements of the USC will need to be finely assessed with a set of budgets, namely:

- a) Capital budget, which includes the pre-operational expenses, the cost of constituting the company, the purchase of office equipment, transportation vehicles, field equipment, laboratory and plant equipment, and civil works and grounds

improvements.

- b) Operational budget, which includes annual costs related to the following major items: purchase of seed under contract, expenses related to the direct production of seeds, such as labor, farm production inputs, fuel, rents and leases, field inspection costs including transportation expenses, per diem allowances of production personnel, power generation costs at the seed plant, bags, tags, chemical seed treatment, transportation costs for seeds to the plant and from the plant, storage lease costs, direct storage costs and a few additional incidentals.
- c) Administrative/Financial budget, which includes salaries, office leases, telephone, utility and services costs, legal reserves and taxes, duties, office supplies, maintenance of grounds, building and equipment, security expenses, insurances, travel, general communications expenses, interests, commissions and other bank expenses.

The requirements for the three types of budgets are presented in a first approximation in Tables IV.2, IV.3, IV.4 and IV.5.

The initial capital required for starting the company shall be the sum required for the operation of the first year. If a grant is applied, the capital requirements will be deducted in the amount of the grant. It is proposed as a model that the grant include the costs of the expatriate personnel related to salaries, allowances, travel, insurances, and the provision of appropriate lodging facilities, and transportation.

The operational budget shall, to a great extent, be provided by credit lines from the Bank of Uganda, in shillings, using as collateral the seed produced and stored in bonded warehouses. The warehouses of the USC shall be considered bonded warehouses for this purpose. The administrative/ financial budgets shall be included in the credit line requirement application to Bank of Uganda in its Uganda Shilling component. The foreign currency component will necessarily have to be provided either from risk capital, or from grants or other outside sources.

The fixed assets of the seed company shall be kept at an absolute minimum consistent with the need to be effective. The list of failed agro-industrial projects

## Administrative Budget, Uganda Seed Company.

Expense Category	Currency of Expense (1)		
	<u>Foreign Exch.</u>	<u>US\$</u>	<u>USh</u>
<b>I. SALARIES AND BENEFITS</b>			
Managing Director (1)	110,000		
Division Managers (2)	192,000		
Administrative Manager (1)		36,000	2,160,000
Asst. Managers (3)		43,200	2,592,000
First Officers (7)		50,200	3,012,000
Second Officers (16)		80,320	4,819,200
Secretaries (4)		15,820	949,200
Permanent Workers (7)		17,500	1,050,000
<b>II. HONORARIES AND FEES</b>			
Legal Counsel	2,000		
Auditors		3,000	180,000
<b>III. COMMUNICATIONS SERVICES</b>			
Phone, fax, telex, radio License		4,800	288,000
<b>IV. SUPPLIES AND MATERIALS</b>			
Office Supplies	4,000	4,800	288,000
Grounds Supplies	2,000	1,000	60,000
Spares	10,000	2,000	120,000
<hr/>			
TOTAL US\$ EQUIVALENT	320,000	258,640	15,518,400
<hr/>			
TOTAL US\$ EQUIVALENT		578,640	34,718,400
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NOTE: (1) The Uganda Shilling expense is expressed in its equivalent in US dollars.

## Operational Budget, Uganda Seed Company

Expense Category	Currency of Expense (1)		
	<u>Foreign Exch.</u>	<u>US\$</u>	<u>USh</u>
<b>I. TRAVEL</b>			
Per diems (1000 man dys)		45,000	2,700,000
Fuel, oil, tires, spares	5,000	20,000	1,200,000
Foreign Travel		7,500	450,000
<b>II. PRODUCTION SUPPLIES &amp; MATERIALS</b>			
Sacs	65,000		
Seed treatment chemicals	60,000		
Other	3,000	3,000	180,000
<b>III. FINANCIAL EXPENSES</b>			
Interest on credits		140,000	8,400,000
Interest on capital eqpt	100,000		
<b>IV. RESEARCH EXPENSE</b>			
Total expense 2% of sales		60,000	3,600,000
<b>V. FUEL AND ELECTRICITY</b>			
Fuel for generator, 6000 gal.			
Diesel fuel oil		13,500	810,000
Spares and service	1,000	1,000	
<b>TOTAL US\$ EQUIVALENT</b>	<b>234,000</b>	<b>290,000</b>	<b>17,400,000</b>
<b>TOTAL US\$ EQUIVALENT</b>		<b>524,000</b>	<b>31,400,000</b>

NOTE: (1) The Uganda Shilling expense is expressed in its equivalent in US dollars.

## Total Cost of Seed, Uganda Seed Company.

Expense Category	Currency of Expense (1)		
	Foreign Exch.	US\$	USh
<b>I. DIRECT COST OF SEED</b>			
Cost of contract seed or directly produced seed		1,649,500	98,970,000
<b>II. ADMINISTRATIVE EXPENSES</b>			
Administrative overhead	320,000	258,640	15,518,400
<b>III. OPERATIONAL EXPENSES</b>			
Direct production costs (variable costs)	234,000	290,000	17,400,000
<b>TOTAL US\$ EQUIVALENT</b>	<b>554,000</b>	<b>2,198,140</b>	<b>131,888,400</b>
<b>TOTAL US\$ EQUIVALENT</b>		<b>2,752,140</b>	<b>165,128,400</b>

NOTE: (1) The Uganda Shilling expense is expressed in its equivalent in US dollars.

TABLE IV.5

## Projected Seed Production Cost for Uganda Seed Company

CROP	Price of Seed \$/Kg	1990		1992		1994		1996	
		Product, MT	Value US\$	Product, MT	Value US\$	Product, MT	Value US\$	Product, MT	Value US\$
Maize, vars.	.22	800	176,000	1000	220,000	800	176,000	500	110,000
Maize, Hy.	.30	300	90,000	500	150,000	700	210,000	1000	300,000
Sorghum, vars.	.28	200	56,000	200	56,000	200	56,000	200	56,000
Sorghum, Hy.	.50	200	100,000	300	150,000	400	200,000	500	250,000
P. Millet, vars.	.28	50	14,000	100	28,000	100	28,000	100	28,000
P. Millet, Hy.	.50	20	10,000	100	50,000	150	75,000	200	100,000
Finger Millet	.28	250	70,000	350	98,000	500	140,000	600	168,000
Wheat & Barley	.17	400	68,000	550	93,500	700	119,000	700	119,000
Beans	.20	500	100,000	1000	200,000	1750	350,000	2500	500,000
Groundnuts	.50	300	150,000	700	350,000	1100	550,000	1500	750,000
Soybeans	.25	50	12,500	100	25,000	150	37,500	200	50,000
Sunflower	1.30	20	26,000	50	65,000	75	97,500	100	130,000
Sesame	.60	50	30,000	100	60,000	200	120,000	250	150,500
Vegetables	7.00	2	14,000	5	35,000	7	49,000	7	49,000
Potatoes	.15	100	15,000	100	15,000	700	105,000	1000	150,000
Forage grasses	6.00	3	18,000	9	54,000	15	90,000	20	120,000
<b>TOTAL US\$</b>		<b>3245</b>	<b>949,500</b>	<b>5164</b>	<b>1,649,500</b>	<b>7547</b>	<b>2,403,000</b>	<b>9377</b>	<b>3,030,000</b>
<b>TOTAL USh (Ug. Sh.)</b>			<b>(56,970,000)</b>		<b>(98,970,000)</b>		<b>(144,180,000)</b>		<b>(181,800,000)</b>



in developing countries is crowded by firms which overinvested in fixed assets. It will be important to assess the extent to which the European Economic Community assistance will provide and execute the final phase, including conditioning/processing plant equipment to the Uganda Seed Project, which may be used initially or for some time by the USC, on the basis of a lease or outright sale. Depending on the rate at which commercial seed production takes off in the USC, it may require to add its own facilities for seed drying, processing, and storage, as well as its inspectors and salesmen vehicles and transportation trucks, and agricultural machinery.

It is tentatively envisioned that the USC may need to operate for the first two years, leasing facilities from the Uganda Seed Project. After this period of time, it may continue leasing some of these facilities, and will need to add its own processing and additional storage. This additional capacity should be sufficient for the planned period of 8 year projection for seed production and storage. All storage facilities may not necessarily be centered in one location. In fact, clear advantages are seen in establishing regional storage facilities for various types of seeds.

The Karamoja Seed Project may expand its facilities, and continue on its own, or become a custom operator, in total or partially, for the USC under a seed production contract.

The German Federal Republic development agency (GTZ) sponsored seed project, based in Masaka, involves bean, soya bean and groundnut seeds with clear regional, rather than national, goals. It may remain a regional cooperative-managed operation while it receives input and financial support from the GTZ.

However, it appeared to the mission that the Masaka project was not planning to expand into the more profitable area of hybrid seed production. If this is so, its eventual financial viability is questionable, and it will either compete with the USC or be taken over by it.

Table IV.6 shows the projected fixed assets structure of the USC at the peak of capital investment.

#### 4. Organization and Management

The Uganda Seed Company by-laws should establish a board of directors, with individual directors having equal votes, and representing voting shares of the

Fixed Assets Structure of the Uganda Seed Company  
Phase I. 1988-1996

<u>Asset</u>	<u>Quantity</u>	<u>Approx Cost</u>	<u>Phase Acquistn</u>
I. Buildings		310,000	II
Seed Processing Plant	( 300 sq m)		
Seed Dryer	( 100 sq m)		
Machinery Pavilion	( 300 sq m)		
Office Bldg incl. Lab	( 600 sq m)		
Seed Storage Warehouses	(1800 sq m)		
II. Seed Processing Equipment		176,470	II
Seed Cleaner/Scalper		22,635	
Seed Sizing Equipment		88,870	
Gravity Separator		15,000	
Seed Treating Equipment		6,770	
Bins and Elevators		6,870	
Bagging, Sewing and Converters		3,250	
Additional Seed Cleaner		2,200	
Spiral Separator		2,400	
Cyclones, Tubing, Etc.		2,500	
Fractionating Aspirator		6,675	
Conveyors, Platform Truck		3,300	
Freight		16,000	
III. Seed Drying Equipment		30,000	II
Fixed Batch Seed Dryer		10,000	
Portable Seed Dryers	(2)	20,000	
IV. Transportation		275,000	I & II
Trucks 10 MT Capacity	(6)	150,000	
Trucks 3 MT Capacity	(2)	30,000	
Pickup Trucks	(4)	40,000	
Cars & Station Wagons	(5)	55,000	
V. Office Equipment		20,500	I
Radio Stations		3,500	
Central Computer		12,000	
Office Machines & Furniture		5,000	
VI. Housing		200,000	II
Houses for Personnel		200,000	
VII. Agricultural Machinery		<u>150,000</u>	I
TOTAL	(U.S. \$)	961,970	

company in proportion to their number. The Chairman of the board should be the President of the company, representing the shareholders to management. Day to day management of the company should be handled by a Managing Director (MD), or Chief Executive Officer (CEO) designated in the by-laws. Three managers would assist the MD:

a) An Administration Manager, responsible for overall administration, including accounting/finance and general services. These services include purchasing, inventory control, stocking of parts, supplies, maintenance of grounds, security, etc.

b) A Production Manager, responsible for planning and supervising functions of seed production, processing and storage.

c) A Sales and Marketing Manager, in charge of seed marketing and sales.

Each manager should be supported by a staff of assistant managers, trained by the managers. The Managing Director and the managers and assistant managers should be recruited on a merit basis. Ugandan candidates should be considered for all three categories, and expatriate candidates in the first two. Managers should serve under contract for a specified period of time. Assistant managers should be locally-recruited, and should have clear opportunities for promotion.

The organizational chart is shown in Figure IV.1.

5. Linkages with Present and Future Seeds Projects

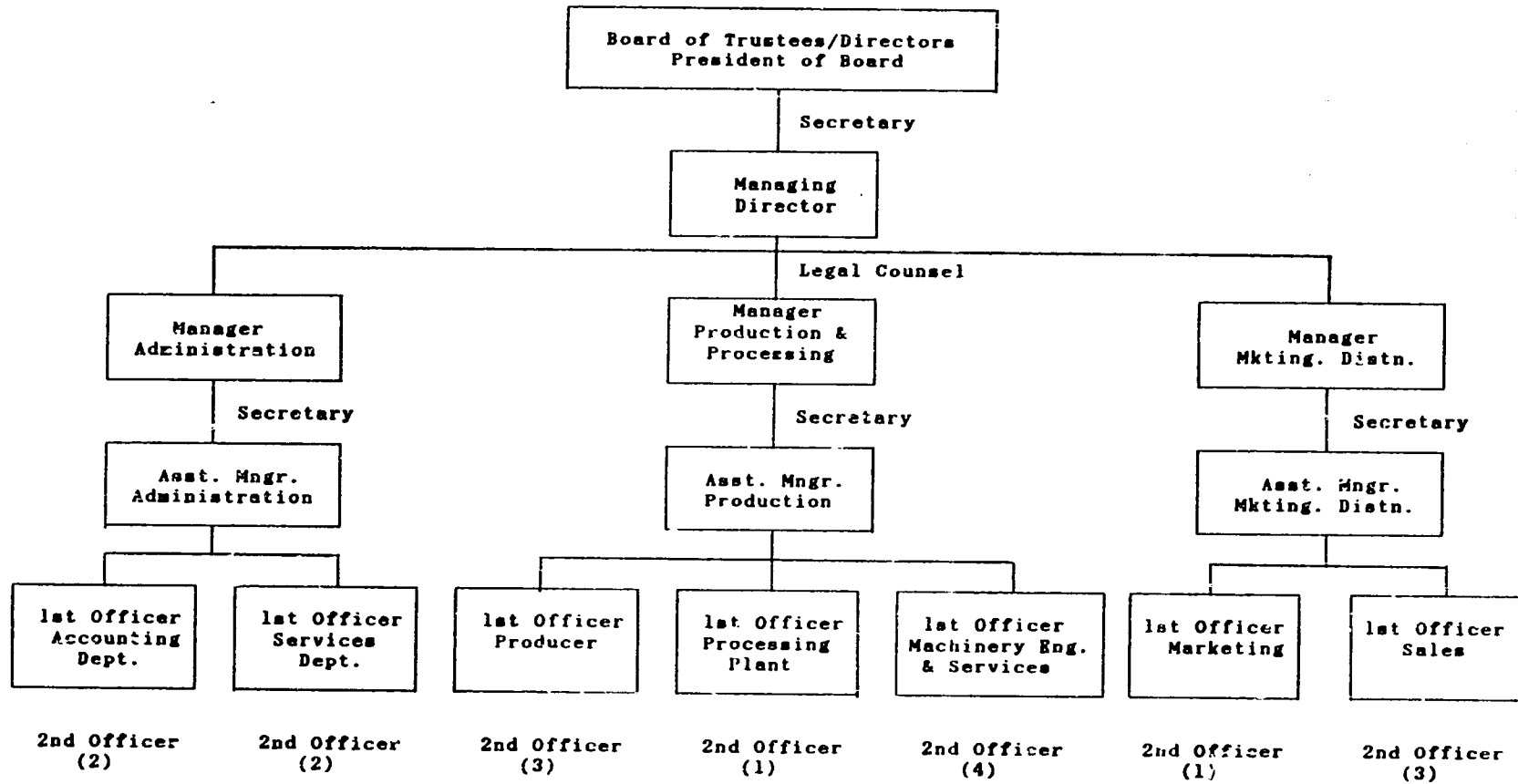
(a) Seeds Projects

For the new national Seed Company, the first and most important linkage would be with the existing Ministry of Agriculture Uganda Seed Project. This Project will be the vehicle through which breeder seed is multiplied through one or two generations to produce foundation seed. This grade would be purchased by the Company and supplied to its contract growers to produce certified seed for sale to farmers. After the first few years of operations, the Kisindi Farm could be totally utilized for foundation seed production. If the Company successfully introduces hybrid maize, sorghum and sunflower, it will be essential to have another large, well managed farm to provide the isolation distances required to maintain and produce

FIGURE IV. 1

UGANDA SEED COMPANY

Organigram



inbred lines and foundation seed. Areas of wild sorghum, abundant in Uganda, could seriously affect the early stages of hybrid and composite sorghum variety production.

The second linkage between the Company and the Project would be in the area of seed certification. The Company would wish to produce all its seed in certification 1 and 2 grades. It would like to be sure that all stocks of foundation seed purchased from the Project had been properly inspected in the field, and had satisfied the higher standards commonly required. At the same time, the Company would wish that all seed produced and sold to Ugandan farmers met the same certification standards, and would expect seed produced in Karamoja and Masaka to be subject to the same inspection procedures as its own.

Grain legumes, particularly groundnuts and beans, are difficult crops for a seed producer because of the low multiplication factor.

	<u>Seed Rate</u> <u>per Hectare</u>	<u>Yield per</u> <u>Hectare</u>	<u>Multiplication</u> <u>Factor</u>
Maize	25 Kgs	2000 Kgs	80:1
Beans	80	800	10:1
Groundnuts	100	900	9:1
Soya Beans	60	1000	17:1

Large areas are needed to produce foundation certified seed. The farmer contract grower is often tempted by black market traders to sell his grain legumes at a higher price than its agreed seed contract. Thus, the G.T.Z. Project at Masaka will be producing seeds that are in high demand, and such production will complement rather than conflict with Company production and distribution. Transport is difficult and expensive because of poorly maintained roads and shortage of transport vehicles.

Seed processing facilities at Masaka, operated by trained staff, could be a valuable part of a national seed production and distribution network in future years. The Masaka Project will eventually be administered by the Ministry of Agriculture, and could be amalgamated with the Company as part of a further Ministry of Agriculture investment.

There could also be useful linkage with the Church of Uganda Project in Karamoja. They have a processing plant and experienced staff at Kotido which, again, could be part of a national network. Their production

contracts could augment the Company production of sunflower, sorghum and millet. The Company's national seed marketing could free Karamoja Seeds from their total reliance upon relief agencies for seed distribution. The possibility of an eventual investment in the Company by the Church of Uganda was discussed with senior management of their seed project.

The government farms to be rehabilitated by the African Development Bank could play an essential part in the Company's progress. One farm, as discussed, could provide foundation seeds. Other farms could provide a large proportion of the contract seed production which will eventually be required. In a country where the average family farm is no more than 2 Ha. or less, it is difficult to imagine thousands of tons of seed production without large scale contracts of 100 Ha. or more being placed. To try to administer, inspect and control 100 individual growers to produce 100 tons of seed would be hopelessly complex and uneconomic. There are many problems with isolation of seed crops fertilized by wind blown pollen unless large farms can be used. The Company would expect to work closely with these government seed farms.

(b) Ministry of Agriculture

The nature of the relationship between the Uganda Seed Company and the Ministry of Agriculture must be well defined and adhered to. The linkage should be close considering that the USC will be instrumental in executing the policies of the Ministry of Agriculture, serving in the private sector as an operating entity.

The Ministry of Agriculture, through its proposed National Seeds Administration (NSA), plans and develops the overall agricultural development policy for Uganda. This policy must integrate crop production, marketing, price support, consumption, storage, and exports. Although supply of inputs enhances crop production, such inputs are secondary to the primary function of providing incentives and security in final commodity pricing. Seed supply, long range plans, development of projections, and execution of the plans requires full knowledge of the planning parameters in order to attain the program goals. The NSA will have to provide the quantities of foundation seed required by the Uganda Seed Company.

At the policy level, the top management of the USC will be represented in the National Seed Council, where policy discussions and problems relating to seeds would

be presented to the Minister of Agriculture for final decision. Direct coordination between the Minister of Agriculture, his delegated officers, and the Managing Director of the USC, will also need to be established in order to enable proper planning and operation of seed production, distribution, testing, extension and financing activities.

A special relationship will be nurtured between the USC and the Agricultural Research Organization, currently being restructured. It will concern testing of varieties which may be in advanced stages of selection (and ready for release by the Research System), observation of farmers plots, opinions on the feasibility and economics of seed production, and problems that might arise for specific varieties, matters of variety registration and release, etc. Seed production research, seed physiology, problems related to seed storage, and germination will require ample understanding and coordination in order to assess research needs and opportunities, collaboration requirements, and execution of the projects.

In terms of extension activities, total cooperation between the USC and the Extension System of the Ministry of Agriculture will be necessary. Farmer demonstrations of new varieties must be developed by the production and marketing officers of the USC in conjunction with the Agricultural Extension Agents, following the Research/Extension activities to determine which varieties and farmer level technologies are to be supported and/or recommended.

A vital linkage must also be developed by the USC at the regional administrative level of the Ministry of Agriculture. Regional activities will be reviewed for the past season, and statistics analyzed regarding seed distribution and farmers' results. The resulting projections, plans, coordination and execution, using the information gathered, will need to be developed in cooperation with the Chief Regional Agricultural Officers of the Ministry of Agriculture, within the overall design and blueprint elaborated at the National level.

(c) Ministry of Cooperatives and Marketing

The success of agricultural development in Uganda, measured by increased output of farm commodities and increased farmer income, will to a large extent depend on the establishment and operation of an efficient marketing policy.

The USC will provide important participation through representation in technical committees which strive to define the marketing policy on key agricultural commodities. Since the opportunity for greater income moves farmers to adopt higher level technologies, reduction of risks prices of final products outweighs the effect of input costs. Input costs are a limiting factor when environmental risks exist, and when market prices for commodities are low. The interrelationship of commodities to seed prices is obvious, and necessitates firm, permanent operational linkages in this respect. The main linkage activities will be at the level of the Produce Marketing Board.

Other important linkages between the USC and the Ministry of Cooperatives and Marketing involve the participation of the Cooperative System in seed distribution, and the support it receives from the Ministry. It is envisioned that the District Union Cooperatives will be active agents of seed sales in their respective areas.

It may be advisable for the USC Board of Directors to include among its Directors at least one representative of the Cooperative System.

(d) Ministry of Industry

Seed industry falls both in the areas of agriculture and industry, and should develop appropriate linkages with the Ministry of Industry. Being in several aspects an industry dependent on some imported inputs, it may require support in this respect in terms of facilitating of hard currency, and securing for the USC the opportunity of developing exports in order to bring hard currency into the country.

Ministry of Industry level decisions pertaining to the USC are likely to be in the areas of duties on the importation of machinery, supplies, bags, and chemicals for seed treatment. They will also relate to operation of the seed plant facility, and to the incentives to be built into the new industrial and related activities law and its interpretation.

Several industries, especially the wheat milling industry, the oil industry, and the alcoholic beverage and beer industries will depend on a part of their raw material needs being supplied from within the country. In this respect, the USC will need to establish proper committee coordinations with the Ministry of Industry,



Ministry of Agriculture and the industries themselves, for the establishment of production campaigns linked to wheat, sorghum, barley, and oil crop seed supplies .

(e) Cooperative System

Linkages of the USC with the Cooperative System will be developed at the national level through the Uganda Central Cooperative Union (UCCU). At the regional level these linkages will be established through the Union District Cooperatives and, at the village level, through the Primary Societies. These linkages will essentially affect:

- 1) Information and education on the merits of new varieties, availability and proper use of seed, and management of the crops until harvest and after harvest. This will include field demonstrations.
- 2) Coordination in distribution and utilization of seeds at the various levels, starting with the forecast of seed needs and ending in assessments of seasonal sales and crop results samples, along with other pertinent information.
- 3) The conducting of business between the Cooperatives and the USC.

While the present mission proposes that the Uganda Cooperative System become integrated with the USC, as an outside partner, it cannot fail to recognize the importance of this system to the overall scheme, as most users will be farmers affiliated with the Primary Societies of the Cooperative System. Recognizing this point, however, the ICD Seed Team thinks that the activity of developing and running a modern, efficient seed company is a highly professional endeavor requiring expertise associated with long term involvement in the seed business. This, certainly, is not available in the Cooperative System in terms of knowledge of research problems, foundation and commercial seed production (including hybrid seed), processing, storage, marketing and distribution of seed--although in the latter areas the Cooperative System has indeed accumulated useful experience. This is the reason that the marketing area has been reserved for Cooperative System involvement.

The participation of the Cooperative System in the Uganda Seed Company Board of Directors may be a healthy possibility, and could be decided upon when choosing the Board of Directors, assigning one Director position

to a representative of the UCCU or the UCB.

The manner of operation for marketing and distribution of seeds through the regional/district Cooperatives will be based upon orders and mode of payment arrangements with sufficient anticipation. The price charged the cooperatives will be a net price, and a suggested list price will carry a mark-up by the Cooperatives which should range in the order of 10% to 25%, depending on whether the seed is open- or self-pollinated or hybrid, and on the rate at which it is planted (kilos per Ha.).

Contacts at the district, regional and national levels will need to be organized between the USC and the Cooperative System. Orders and forms of payment will be defined each season, and required quantities will be subject to joint planning at each level. The Cooperatives will be given a net price and credit terms, and will be required to add a mark-up no higher than a fixed net percentage dependent on the seed type, which may vary between 10 and 25%.

(f) Dealers

The relationship of the USC with the dealer network will be that of a normal business relationship dealer-seed company, as found in most countries for similar enterprises. A model similar to that developed by the Kenya Seed Company using a network of private wholesalers and retail dealers to cover villages and general stores, will be put into operation. Allowable percent mark-ups would be only those required to distribute and sell seeds in the market. The use of weekly village markets could also be a good opportunity for promotional sales, using the normal marketing system prevalent in Uganda, in which some types of seeds could be marketed efficiently.

Dealers will benefit from training by the USC and the agricultural Extension System. They may become valuable elements in the dissemination of production information to farmers, which has happened in other countries.

The dealer network will operate in parallel with the Cooperative System, on an open-competitive basis. Seed will be sold to both the Cooperatives and the dealers on the basis of demand, and credit terms through a similar arrangement. It is envisioned that both systems will complement each other and will allow an efficient marketing system to operate.

(g) Farmers

A most important relationship is that of the seed company with the farmers. The USC must establish close linkages with farm leaders, either through the Primary Societies or the District Union, or directly through selection of important opinion leaders and advanced farmers. Discussions on varietal characteristics and farmer needs should be of utmost importance in defining the types of products brought to the market.

The USC will also establish training courses and field demonstrations for its seed producers, and for farmers in general. It will work through contract farmers in various areas of the country to demonstrate products and technology.

The importance of the public relations meeting with farmers cannot be overly stressed. These meetings will require thorough organization and national coverage.

An effective method of conveying information to farmers will rely heavily on field days and meetings with groups of farmers in farmers' fields, where advanced technology and improved varieties are being produced. Meetings in villages, at the seed plant, and in the USC research plots will also prove helpful.

Finally, video demonstrations and publications will be required. Special concentration on linking the Extension System into this effort should be included.

6. Location of Operations

During the first 2-3 years of operation, the USC should consider entering into a lease agreement with the Uganda Seed Project (or its successor) to utilize the existing or expanded seed processing facilities at Masindi, Karamoja and Masaka. This is based on the assumption that surplus seed processing capacity will continue to exist in the present and will exist in the near future. Later on, starting with year 3 or 4, the USC could increase seed processing capacity by adding its own plant(s).

The Masindi operations could be carried on to handle the processing of foundation seed from Kisindi farm and elsewhere, and also some tonnages of certified seeds. Eventually, as discussed, it is hoped to bring processing facilities at Masaka and Kotido into Company operations. Masindi, in fact, is not located in an

area of intense food crop production, such as the fertile crescent or the area around Mount Elgon. Soroti, however, is close to major production areas. It is close to Serere Research Station. It has long periods of lowered humidity after harvest for seed processing and storage. Soroti has good communications by road, rail and--when restored--by boat across Lake Kyoga, with major population centers to the northwest, the southeast and the fertile crescent around Lake Victoria. It is recommended that very serious consideration be given to Soroti as the major center of Company seed processing operations.

7. Seed Product Research and Development

The products to be sold by the Uganda Seed Company as a source of revenue are seeds of improved varieties and hybrids. The seeds must be of high biological worth, good presentation, and must be capable of reflecting in farmers fields a high genetic yield potential, good resistance or tolerance to diseases and insects, and high and acceptable market quality.

If the varieties are equal or inferior in any or most of the above mentioned characteristics to those in use by the farmers, very little seed will be sold to farmers, since yields do not meet expectations.

The availability of improved varieties and hybrids is of utmost importance to the USC, and will be the foundation of its very existence. A continuous flow of new varieties into the seed production pipeline is another fundamental requirement. USC needs products and needs those products on a continuous flow basis and in rapid sequence.

At present, the varieties available in Uganda are old, and could probably be used--if they are properly recovered and maintained--for at most, 4 or 5 years. The only available source of variety replacement is the Agricultural Research Program of the Ministry of Agriculture. It is in the best interest of the USC that this program become effective and capable of delivering high yielding varieties in a short time frame.

The USC cannot, however, found its existence on the assumption that the Agricultural Research Programs of the Ministry of Agriculture will prove successful. If for any foreseeable or unforeseeable reason delays in delivery of new varieties and hybrids result, the USC could suffer economically, or fail.

The need to establish its own research programs becomes critical for the survival and growth of the USC. Such a research program may not necessarily have to be large. Material could be supplied by other seed companies, who might provide genetic material adaptable to Uganda and work with the USC in development of products under a licensing agreement. Payment of license fees could be made by bartering arrangements for agricultural commodities.

The savings in time, the arrangement of a backup and security system of new seed varieties, and especially the availability of hybrids and production information on such strategic crops as maize, sorghum, pearl millets, and sunflowers, may spell the difference between success and failure of the USC project.

It is proposed, therefore, that starting with the first year of operation of the USC, a team of two or three locally trained research agronomists be hired. They would work under the leadership of either the General Manager or the Production Manager, who should have additional functions in their job descriptions as Research and Development Project Leaders. The Research Team will report to him through a Senior Research Scientist.

The main research thrusts will be based on importation of hybrids and lines under license agreements, full ownership respect and protection of rights of the original developing company, and assurance of payment of royalties. They will continue with testing of such hybrids and their parental materials for performance as commodities. They will also enter into the development of seed production techniques adapted to local situations. Future developments and inclusion into their own breeding activities may require the establishment of a firm base of seed production and marketing over at least a period of ten years.

Maize research should be directed at obtaining high yielding, full season tropical hybrids for both white and yellow grain maize growing areas, mostly around Lake Victoria. For the northern dryer areas, a shorter season type of hybrid or open-pollinated variety should be developed.

Sorghum and millet research should aim at obtaining new hybrids with good parental lines, which are adapted to Uganda conditions and useful in direct human consumption and grain milling.

Beans should be obtained with high levels of resistance to diseases. It is possibly in this area that public research, through help from CIAT, may make its greatest contribution.

Oil seed crops, including sunflower, groundnuts, and sesame will need to be research-linked to the development of a market with the oil milling concerns in the country. In any event, the greatest opportunity in this area for the USC lies in hybrid sunflowers. Access to hybrid material and to their parental lines will necessitate company to company agreements, in which a private organization will undoubtedly have critically important advantages over public sector research in transferring materials and information from foreign companies to Uganda.

The budget requirements for the research effort may be linked to the sales volume, and constitute some 1 to 2% of it.

#### 8. Seed Production System

The ICD mission found that the production system for seeds may be a critical issue to be contemplated and defined at the outset of the project.

Working with many small producers would be both expensive, and unwieldy. The control needs of many small plots may be impossibly demanding during certain periods of the year, where transportation on Uganda roads in some regions becomes very difficult.

An alternative would be to lease public land and conduct a substantial amount of seed production on such land. The Prison Farm System and medium-sized farmers could also be linked as contractors for seed production. The balance would be contracted with small size farms, especially with those that have acquired some experience--such as the members of the recently formed Seed Producers Association in Masindi.

Seed production areas may not necessarily have to be areas of highest crop concentration. There may be some advantages in isolation for disease and genetic purity reasons in other areas. Areas for seed production will, however, generally fall within the main agro-climatic areas where given crops perform well in yields.

Seed production agronomists will, with their teams of technicians, perform the field duties of contracting the planned areas, providing the basic seed, aiding in

securing credit for the seed growers, supporting them with technical advice, logistics, and other forms of assistance, and collecting and handling the seed crop. The teams may be organized by areas and by crops within areas. Liaison will be made with the Ministry of Agriculture for field inspection of fields to be certified and for general informative, technical support and statistical purposes.

9. Seed Processing System

Seed collected from farmers, after field drying or, if necessary, dried with the help of portable driers, will be handled in the seed processing/conditioning plant.

Seed samples will be secured in time to assess the quality of the seed crop and the need for special conditioning of the seed lots.

In general, seed should be treated in the field for insect/pest protection if it is to remain in the field for any period of time before being brought to the seed plant.

Reasonable precleaning (scalping) and cleaning should then be effected and, in most cases, clean seed should go to storage and to chemical treatment at the appropriate time. This could be the case for beans and soya beans. As most planting is done by hand, the cost of seed sizing or grading could be saved, as it would bring very little benefit, if any, to the final user. Graded/sized lots could be offered for the few farmers who would use mechanical planters. Such a policy may save not only costs, but considerable time, and add throughput to the processing line.

Processing of seeds would be handled by crops and by lots. Lines could be run in parallel for certain crops at the seed processing plant in order to cut short the processing time needed to handle the total crop. Lines will be made interchangeable for the various crops, so that the same line may serve for several seed crops.

It is proposed to establish two parallel lines at the main seed processing plant. One of them will be a small capacity line, which would operate at the time of peak demand, discharging overloads from the main one in processing seeds of different types. As the future situation warrants, a second seed plant could be established or further lines may be added.

Groundnut seed processing could be handled at the

present peanut plant located in Masindi under a leasing arrangement, adding to the plant the equipment that might be necessary.

Portable seed plants, mounted on trailers, could be hauled by pickup trucks to support the processing of seeds at peak periods of work, or for specific situations and locations where transportation to and from the seed plant might be too expensive.

The relative use of these processing resources would require a detailed study of market distribution, costs of transportation and the optimization of processing and reduction of costs on the basis of a linear programming transportation model.

Portable shelters for maize, threshers for sorghum, and cleaners for all crops, could help seed growers in doing a better and faster job of processing the seed crop. Portable seed driers might be used at peak times and for larger crop areas, such as those that would be handled by the seed company itself, by larger contractors such as the prison farms, and for emergency situations.

The processing demands for supply of seed over two seasons per year require that those crop seeds which are planted twice a year be processed in time. Carry-over production from previous crops may be required to allow for early distribution, and may demand planning for processing such carry-overs.

#### 10. Seed Marketing and Distribution System

Seed marketing by the USC requires the handling of a number of crop seeds for a number of regions throughout the country, appropriate planning in the distribution systems, and the repetition of the marketing actions over two seasons each year.

Seed will have to be priced at levels which allow the operation to maintain its profitability. It is planned that after its start up the USC operation will not be subsidized. It is estimated that self-pollinated and open-pollinated seeds will need to be priced in the range of 1.5 to 2.5 times the price of the corresponding grain crop. Hybrid maize seed may have to be priced at between 5 and 7 times the price of grain. Sorghum seed prices should be between 8 and 10 times the price of grain. For other crop seeds cost and market analysis may define the range of prices required. Some approximate prices have been developed



and included in Table IV.1

The price of seed includes a distribution discount which could range between 10 and 40% depending on type of seed. On hybrid maize seed, it might be in the neighborhood of 25%.

For high percentages of discount, the distributor would not have the benefit of return of unsold stocks. The final policies would have to be defined.

The process of distribution itself would be handled by the Cooperative System and, in parallel, by a network of dealers. Prices would reflect a semi-fixed ratio of the price paid to farmers for the commodities they produce. They would be more accurate in the case of cereal grains or legumes. Prices would be fixed for each season at the beginning of the season.

In order to access as wide a market as possible, the packaging of seed shall be done according to the analysis to be made of the optimum packaging size required by various types of farmer operations. Smaller package sizes for some seeds like millets, sorghum, and maize may be needed in the majority of the areas of Uganda.

## V. FINANCIAL CONSIDERATIONS

### A. Seed Pricing Policy

The Uganda Seed Company will require freedom to fix and adjust its prices to levels which make the seed operation profitable. The participation of the Government of Uganda in the structure of the operation will act as a safeguard against monopolistic abuse.

Prices will need to reflect costs of production including the contract costs of seed. In general, prices for open-pollinated and self-pollinated varieties will be on the order of 1.6 to 2.3 times the price of grain. Sorghum and millets will vary between 7 and 10 times the price of grain. To stimulate the use of hybrid seed which will allow a measurable increase in yields, commodity prices need to be adjusted to realistic levels. Sunflower will be priced at four dollars for imported seed, but will later adjust to local market price.

### B. Investment Plan

At this point the ICD team can only suggest the likely needs and sources of support.

It is possible that a US\$ 1.0 million long term (twenty year) loan at 2-3% interest with a 5-year grace period will be required. Additionally, a loan of US\$ 1.0 million in Uganda Shillings could help provide leverage for obtaining credit for local currency to raise working capital. The seed purchased would be the collateral for the remainder of the credit. The above could also be in the form of a grant. Either would cover the purchase of equipment and salaries for expatriates. Eventually, the firm would have to be able to generate FX earnings to cover expatriate staff and replacement equipment, parts, as well as the FX parts of processing. Table V.1 presents cost of processing information for seed produced by the Uganda Seed Project and is indicative of some of those costs.

Since donor decisions about loans and grants are yet to be discussed, the above suggestions are excluded from the financial issues discussed below. This also affects determination of the level of share capital. However, elsewhere in this report (III.D.3) the investment structure is elaborated. The first year operating expenses define the initial capital requirement.

Uganda Seeds Project Seed Processing Costing  
(Based on 1000T of Maize)

- Operations: A. 1) Drying  
 2) Shelling and Precleaning  
 3) Cleaning each 500 hours per operation:
- Fuel consumption rate = 5 lt/hr  
 Capacity = 2T/hr  
 Time =  $\frac{1000T}{2T/hr} = 500$  hrs  
 3 operations each = 500 X 3 = 1500 hrs  
 500 hrs/operation = 500 X 3 = 1500 hrs  
 Fuel price = 22/= /lt  
 Operational cost = 1500 hrs X 5 lt/hr X 22/= = 165,000/=
- B. Fumigation: Phostoxin tablets:  
 Rate = 4 tablets/ton  
 Price/tablet = 7/=
- = 4 Tabs X 1000 Tons X 7/= = 28,000/=
- C. Seed Treatment:
- 1) Vitaflo:  
 Rate = 1.5 ml/kg  
 Cost = 20/= /lt  
 TOTAL =  $\frac{1.5}{100} \times 1,000,000$  kgs X 20/= = 300,000/=
- 2) Dieldrin i:  
 Rate = 1.5 ml/kg  
 Cost = 90/= /lt  
 TOTAL =  $\frac{1.5}{100} \times 1,000,000$  kgs X 90/= = 1,350,000/=
- 1) + 2) = 1,350,000/= + 300,000/= = 1,650,000/=
- D. 1) Packaging = 30/= / Packet of 10 kgs  
 = 300/= X  $\frac{1,000,000}{10}$   
 = 3,000,000/=
- 2) Thread = each 3 Tons/Roll  
 1000 Tons =  $\frac{1000}{3} = 333$  Rolls  
 1 Roll = 400/=
- TOTAL Cost of Thread = 333 X 400 = 133,200/=
- 1) + 2) = 3,133,200/=

E. Stationery = 2,000/=

F. Storage:

1) Palletization:

a) 1-1/2 tons/pallet

1000 tons = 1000 X 2/3 = 667 pallets

Cost of pallet:

i) Timber = 6 pieces each 200/= each  
= 1,200/=

ii) 1/2" Nails/pallet @ 200/= kg  
= 100/=

Cost per pallet i) + ii) = 1,300/=

TOTAL cost of pallets = 1,300/= X 667  
= 861,000/=

2) Actelic Dust:

Rate = 50 gm/kg

1000T =  $\frac{1,000,000 \text{ kg} \times 50 \text{ gm}}{100 \text{ kg} \times 1000 \text{ gm}}$  = 500 kg

Cost each 228/= kg = 228 X 500 = 114,000/=

1) + 2) = 867,100/= + 114,000/=  
= 981,100/=

G. Labour (for 20 workers):

TOTAL Labour Cost = 300/= / worker X 500 hrs X 20 wkrs  
176 hrs/month  
= 17,045/=

H. Overheads = Total Labour Cost X 2/3  
= 17,045 X 2/3  
= 11,363/=

I. Capital Investment, Depreciation & Machinery  
(Maintenance is not included)

Summary	a) Drying, shelling, precleaning, cleaning	
Opers:		= 165,000/=
	b) Fumigation	= 28,000/=
	c) Seed Treatment	= 1,650,000/=
	d) Packaging	= 3,133,200/=
	e) Stationery	= 2,000/=
	f) Storage	= 981,100/=
	g) Labour Cost	= 17,045/=
	h) Overheads	= <u>11,363/=</u>
		<u>5,987,708/=</u>

Seed Processing Cost = 6/= kg

Table V.2 presents an initial and simplistic cash flow analysis for the Uganda Seed Company. Information summarized in this table is drawn from Table IV.1 (revenue) and Tables IV.2, IV.3, IV.4, IV.5 and IV.6. Other assumptions are noted. Table V.2 serves as the basis for the following analysis and conclusions.

C. Seed Production and Marketing Projections

Seed production assumptions are taken from Table IV.1 (revenue) or Table IV.5 (cost of seed). The initial assumption is project production to increase to over 9000 MT/yr after eight years. If policies discussed elsewhere are in place, this volume of production could be achieved earlier. If, on the other hand, market prices do not improve and exchange problems persist, seeds could leak to other countries.

As a sensitivity factor (discussed in detail below) a volume reduction of 50% is assumed over the 9-year period depicted (see Table V.3). This volume reduction could also serve as indicative of other potential negative factors which might retard the growth of the Uganda Seed Company.

The 9000 MT projection assumes an expanding demand for improved seeds over and above the base projection shown in Table III.2. This arises from the impact of and demand for hybrid seeds, especially maize, sorghum and sunflower. Some other summary points follow.

The production and sales targets have been calculated with the following considerations:

- (a) Maize and sorghum seeds are fairly easily produced. Without open-pollinated varieties distinctly superior to those now in use--Kawanda Composite A maize and Serado sorghum--it will be difficult to sell more than a few hundred tons. The immediate purchase of foundation seeds of the Kenya hybrid maize varieties, and the introduction after 3 to 4 years of testing of hybrid maize and sorghum varieties from international sources, should sharply increase sales possibilities.
- (b) The finger millet crop has declined during the last 20 years. Seed planting rates are low and maximum sales are unlikely to be great.
- (c) The introduction of hybrid sunflower seed to the market, coupled with government wishes to increase

TABLE V.2

## Estimated Cash Flow, Uganda Seed Company, 1988-1996, Base Case

	1988	1989	1990	1991	1992	1993	1994	1995	1996
<b>Cash In</b>									
Revenue <sup>1</sup>	489,250	998,500	1,997,000	2,737,500	3,478,000	4,242,250	5,006,500	5,687,000	6,367,500
Share Capital									
Debt - long term, <sup>2</sup>									
Debt - short term <sup>3</sup>	237,375	474,750	949,500	1,299,500	1,649,500	2,026,250	0,000,000	0,000,000	0,000,000
<b>Total In</b>	<b>736,625</b>	<b>1,473,250</b>	<b>2,946,500</b>	<b>4,037,000</b>	<b>5,127,600</b>	<b>6,268,500</b>	<b>7,409,500</b>	<b>8,403,500</b>	<b>9,397,500</b>
<b>Cash Out</b>									
Cost of Seed <sup>3</sup>	237,375	474,750	949,500	1,299,500	1,649,500	2,026,250	2,403,000	2,716,500	3,030,000
Administrative <sup>4</sup>	578,340	578,340	578,340	578,340	578,340	478,340	478,340	478,340	478,340
Operational <sup>5</sup>	74,887	149,775	299,550	410,625	524,000	636,338	750,975	853,050	955,125
Capital Expenses <sup>6</sup>	40,000	-	961,970	-	-	-	-	425,000	-
Loan Amortization Long Term <sup>7</sup>									
Dividends <sup>8</sup>				XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
<b>Total Out</b>	<b>930,602</b>	<b>1,202,865</b>	<b>2,789,360</b>	<b>2,288,465</b>	<b>2,751,840</b>	<b>3,140,928</b>	<b>3,632,315</b>	<b>4,047,890</b>	<b>4,463,465</b>
<b>Net Cash Flow Yr.</b>	<b>(193,977)</b>	<b>270,385</b>	<b>157,140</b>	<b>1,748,535</b>	<b>2,375,660</b>	<b>3,127,572</b>	<b>3,777,185</b>	<b>4,355,610</b>	<b>4,994,035</b>
<b>Net Cash Flow Cumulative</b>	<b>(193,977)</b>	<b>76,408</b>	<b>233,548</b>	<b>1,982,083</b>	<b>4,357,743</b>	<b>7,485,315</b>	<b>11,262,500</b>	<b>15,618,110</b>	<b>20,612,145</b>

NOTE: All figures are given in U. S. dollars

## Table V.2      Notes

1. See Table IV.1. Linear estimates are made for missing years.
2. Discussions with donors and/or private sector would determine mix. Initial amount would need to cover first year costs.
3. Short term debt is to finance cost of seed from outgrowers and USC fields. Initial leverage will be needed. Retailed financial analysis will need to be made on a month by month basis to show short term debt requirements within a year.
4. Administrative costs are assumed to be the same in years 1-5 and to drop by \$100,000 in subsequent years as staff expands and expatriates are replaced by nationals.
5. Operational expenses are taken from Table IV.3. These are the variable costs for 1992. Other years are also estimated as 15% of revenues. Interest costs in Table IV.3 should be broken down in future analysis, especially the short term loan interest covering 6-9 months a year.
6. 1988 expenses are for \$40,000 mobile seed plant. 1990 expenses are taken from Table IV.5. 1995 capital expenses are for equipment replacement.
7. Subject to further refinement as in Note 2 above.
8. Dividends could begin in 1991 when the cumulative cash flow is greater than working capital.

TABLE V.3

## Estimated Cash Flow, Uganda Seed Company, 1988-1996, Sensitivity Case

	1988	1989	1990	1991	1992	1993	1994	1995	1996
<b>Cash In</b>									
Revenue <sup>1</sup>	249,625	499,250	998,500	1,368,750	1,739,000	2,121,125	2,503,250	2,843,500	3,183,750
Share Capital									
Debt - long term									
Debt - short term <sup>1</sup>	118,687	237,375	474,750	649,750	869,500	1,013,125	1,201,500	1,358,250	1,515,000
<b>Total In</b>	<b>368,312</b>	<b>736,625</b>	<b>1,473,250</b>	<b>2,018,500</b>	<b>2,563,750</b>	<b>3,134,250</b>	<b>3,704,750</b>	<b>4,201,750</b>	<b>4,698,750</b>
<b>Cash Out</b>									
Cost of Seed <sup>1</sup>	118,687	237,375	474,750	649,750	869,500	1,013,125	1,201,500	1,358,250	1,515,000
Administrative <sup>2</sup>	578,340	578,340	578,340	578,340	578,340	478,340	478,340	478,340	478,340
Operational <sup>3</sup>	37,443	74,888	149,775	205,312	262,000	318,169	375,487	426,525	477,562
Capital Expenses <sup>2</sup>	40,000	-	961,970	-	-	-	-	425,000	-
Loan Amortization									
Dividends <sup>2</sup>				XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
<b>Total Out</b>	<b>774,470</b>	<b>890,603</b>	<b>2,164,835</b>	<b>1,433,402</b>	<b>1,709,840</b>	<b>1,809,634</b>	<b>2,055,327</b>	<b>2,688,115</b>	<b>2,470,902</b>
<b>Net Cash Flow Yr.</b>	<b>(406,158)</b>	<b>(153,978)</b>	<b>(691,585)</b>	<b>585,098</b>	<b>853,910</b>	<b>1,324,616</b>	<b>1,649,423</b>	<b>1,513,635</b>	<b>2,227,848</b>
<b>Net Cash Flow Cumulative</b>	<b>(406,158)</b>	<b>(560,136)</b>	<b>(1,251,721)</b>	<b>(666,623)</b>	<b>187,287</b>	<b>1,511,903</b>	<b>3,161,326</b>	<b>4,674,961</b>	<b>6,902,809</b>

NOTE: All figures are given in U. S. dollars.



## Table V.3        Notes

1. This table assumes half the sales and half the variable costs of seed and operations. This also affects the short term debt.
2. These are assumed to be the same as Table V.2, although the timing of capital expenses could be delayed because of the decreased sales/production.
3. Dividends could begin 1993 (two years later than the First Scenario) when cumulative cash flow exceeds working capital requirements.

vegetable oil production, should eventually encourage planting of the crop.

(d) Similar government support is being given to the soya bean crop.

(e) There would be little difficulty in selling large volumes of beans and groundnuts if this quantity could be produced.

D. Inputs Assumptions and Acquisition and Utilization of Fixed Assets

There are many assumptions and estimates about the inputs needed to begin the Uganda Seed Company. Clearly, a sizable amount of land will be needed at multiple sites to begin research by the Company. This land could be leased or granted by the GOU.

The purchase of plant equipment, etc., shown in Table IV.6 is assumed to be in the third year of the project. Some equipment and facilities may be needed earlier and some later, depending upon the access to extant facilities at Masindi, Masaka and Karamoja by the USC. Additionally, a mobile processing plant estimated at US\$ 40,000 is to be purchased in the first year. Replacement for machinery is assumed after five years. (Depreciation, not estimated here, would occur over that period on a straight line basis.) Use of facilities at Masindi could be optimized by establishing three shifts and an extension of the processing season. Additionally, real throughput would be enhanced by not resorting to seed sizing which usually delays the speed of the line. Maize seed sizing may not be required, for example. Table V.4 is presented as a detailed estimate of the cost of processing equipment CIF Uganda for a plant capable of handling 4000 to 5000 MT/yr.

It is clear that cooperation with other seed projects is critical to the early years of operation of the USC, not only for foundation seed but as custom conditioning operators, processing some of the seed requirements of the USC for a fee.

E. Summary of Base Case Projections

Table V.2 presents, in a cash flow format, an initial and very approximate estimate of the financial performance of the USC in its first nine years of operation. Explanations of the assumptions appear in the notes to the table.

Estimate of Processing Equipment Costs  
Carter Day International, Inc. December 1987

1 930 Carter Screen Machine, Style CPR1, with 11" x 36" Carter Scalper Aspirator, Style CRC1 with integral fan, air flow indicator and steel fluted feed roll with drive for 1 HP C-flange motor (less motor).	\$ 22,175.
1 2 HP Motor, 1500 RPM (for Scalper Aspirator fans)	250.
1 1 HP Motor, 1500 RPM (Scalping reel)	210.
1 1.5 HP Motor, 1500 RPM (Screen Machine)	240.
1 No. 3 Uniflow Cylinder Separator, with 1 cylinder, V-belt drive and guard for 1500 RPM Motor (less motor)	2,950.
1 1/2 HP 1500 RPM Motor	195.
1 Model 48" Carter Fractionating Aspirator, open circuit Style CEY2	6,675.
1 5 HP Motor, 1500 RPM	335.
1 Model 48" Carter Duo-Aspirator, closed circuit, Style AS9, less motor	8,135.
1 2 HP 1500 RPM Motor	250.
1 S-600SS Stainless Steel Seed Treater. All high corrosion resistant stainless construction for easy clean-up and long equipment life. Includes a 10" diameter combination flighting mixing rods coating chamber. Includes one 2 HP T.E.F.C. Motor for treater and 13 HP T.E.F.C. Motor for pump kit	4,470.
1 PM 50 Stainless Steel Premix Tank (50 Gal/189.2 Litre tank with two, 1/3 HP T.E.F.C. motors)	2,145.
1 ESP Model GB-32 (same as the Richardson) Bagging Scale, including counter and heavy duty feature for bag over 59 Kg.	2,220.
1 Fischbein Model ECR Bag Closer (Model 'E' is discontinued) with 1 PH/50 HZ Motor. With Model 1550 Suspension Unit (32) 8 oz cones, and (25) D-5 needles	1,030.
1 40' Container Loading and Packing	1,975.
Est. Inland Freight	<u>1,950.</u>
Total Net Price FOB Port	55,205.
Est. Ocean Freight Plus Ins.	<u>4,100.</u>
TOTAL NET PRICE CIF UGANDA	U.S.\$ 59,305.

Est. Ex-Factory Delivery: 10-12 weeks after receipt of order and all necessary documents.

Payment Terms: Payment in advance or confirmed irrevocable letter of credit payable at sight against documents.

Proforma Validity: 90 days after date of issue.

There are critical elements not estimated at this point. However, many of these factors will need to be developed as the USC takes shape. Other estimates--fixed assets, for example--will also evolve in cooperation with current seed programs in Uganda.

Nevertheless, Table V.2 clearly indicates the quick financial growth of the USC should the predicated market develop and the company be allowed to charge a fair price for the product. This occurs even with the relatively large fixed asset acquisition in 1990. Indeed, theoretically, dividends could be paid to shareholders beginning in 1991, the fourth year of the project. Initial grant or loan requirements of US\$ 2.0 million as well as approximately US\$ 1.0 million of share capital (in both FX and US\$) would adequately address the early year needs of the company, given the underestimate of cash out items. One could begin to estimate the share capital and/or long term loan requirements by backtracking from the projected cash flow to acquire enough of either to cover first year expenses plus cash flow deficits. Since both net and cumulative cash flow become positive in the second year of operation, initial share capital or long term loans could support earlier plant expansion, if needed.

#### F. Sensitivity Analysis

The analysis presented here is tentative, requiring much further refinement. Most assumptions and estimates are potentially subject to dramatic change. For purposes of examining the sensitivity of the aforementioned apparent positive analysis of cash flow, only one variable, however, is adjusted. That variable--the total seed production/revenue--affects the variable costs of seed and seed production, including the interest on short term debt. In this case all these variables are halved. This may arise because of problems in providing product, poor distribution channels, controlled prices, or slower than anticipated adoption of the improved technology.

The results of diminished sales on cash flow are a negative cumulative cash flow for the first four years of the project. This would indicate the need for a larger amount of share capital or long term loans. It might also indicate that the proposed third year plant acquisition should be, in part, postponed while existing facilities are more intensively used. Many of the fixed assets shown in Table IV.6 can be postponed. However, vehicles for expatriate and Ugandan personnel will be needed as well as

agricultural equipment. Housing costs could be reduced (perhaps) by using prefabricated units (which, however, increase FX capital requirements).

Dividends could begin in 1993, the sixth year of the project. This occurs generally when cumulative cash flow exceeds working capital requirements. Overall potential financial benefits to the USC are significantly postponed. Less dramatic revenue cuts would obviously fall between these cases. If macro-economic and industrial policies do not accommodate and foster an environment for private enterprise, the financial viability of the USC is in doubt.

G. Issues for Economic Analysis

From the above tables and analysis, several economic issues arise. Foreign exchange and its availability has been discussed numerous times in this report. FX costs are segregated in the cost estimate tables. Financial analysis assumes the nominal exchange rate (60 USh = US\$ 1) but economic analysis could measure the real value, usually correlated with the black market rate (200+ USh = US\$ 1). Disregarding institutional constraints on access to FX, the real value of FX requiring inputs in economic terms is significantly greater than the financial estimates.

The mission considers that financing the capital assets and operation of a new seed company in Uganda from external sources of funds, either through banks or through investors' own resources, may be somewhat difficult, because of the risk image associated with such an investment. In order to offset these difficulties, we propose the following financial plan:

1. A USh loan will be needed for: (a) working capital to start seed production and build up seed inventory, especially during the first two years of operation when a negative cash flow may be encountered; (b) payment of service to Uganda Seed Project for use of warehouses and service in seed processing; (c) payment of local salaries and operating expenses; (d) costs in local currency associated with the construction of processing plant, office, warehouse and residence buildings, development of research facilities, and transportation and installation of seed plant and other equipment.

This loan amount will correspond to the shilling component presented in Table IV.4, which adds up to USh

131,888,400, or its equivalent in US\$ -- \$2,198,140. This loan with a 3 year grace period would be repaid over a 10 year period, ending in year 13.

2. A dollar loan, payable in shillings or partly in shillings and partly in dollars to insulate the seed company from losses due to inflation, would serve to pay for the nearly US\$ 1,300,000 required for purchasing seed plant equipment, transporting it to Uganda and for payment of operational expenses requiring foreign exchange for importation of inputs such as bags, chemical treatment, etc. This loan could be disbursed over the first three years of the project, with \$516,000 disbursed during the first year, and \$784,000 during the next two years. During all three disbursements the purchase of equipment, prefabricated housing, transportation vehicles, agricultural machinery and miscellaneous equipment would be considered. Seed plant equipment will be paid for during the second and third years. The loan would be repaid with a 3 year grace period over a 10 year period, ending in year 13.

3. The project envisions that a grant may be needed to pay for personal services of the management team, part of which will be in US dollars and part in shillings. This grant will cover three years of operation. Its dollar component will be approximately \$900,000 used to pay salaries and benefits of expatriate personnel during the first three years, and \$486,000 equivalent paid in USh to pay for salaries and benefits of other personnel for the first two years.

This grant would be justified by the management services and technology transfer function associated with the participation of a management team experienced in seed production, marketing and management of a seed company. Management will need to use the hard currency to obtain foreign exchange to pay salaries and benefits while the company is taking off and until it reaches self sufficiency.

Should public funds be provided in either loan or grant form, broader economic issues in cost/benefit analysis will also need to be addressed. While a detailed cost/benefit analysis is premature at this point, several factors should be mentioned. The economic benefits of the project will be measured primarily by the net increase in production from the use of the improved technology. This will be determined by the ability of the farmer to acquire the cash (credit) to purchase the seed, and the price effects from increased supply. Also, costs to the Government of Uganda will

increase should projected production occur because existing facilities are not large enough to supply the foundation seed.

The net cash flow for the first 9 years of the project for both the base case and the sensitivity case is positive, and reflects an expectation of net earnings per year as high as those expected of seed industry activities in other countries, with an acceptable ratio of benefit to investment.

Finally, both financial and economic projections and assumptions are premised on both economic and political stability, as well as a positive atmosphere for private enterprise. This is at best uncertain. The ICD team joins many with whom we visited in hoping that the obvious potential of the people and country can be realized.



**APPENDICES**

APPENDIX A

Travel Itinerary and Persons Interviewed

<u>Date</u>	<u>Time</u>	<u>Activity</u>
Oct. 17, 1987		Kawanda Research Station Bukalasa Agricultural College Gayaza Experiment Farm Kabanyolo Experiment Farm Namulonge Experiment Farm
Oct. 18		Africa Basic Foods Corporation Charles Nalyaali
Oct. 19	0800 hrs	ADO/USAID/KAMPALA
	0900 hrs	GM/Uganda Cooperative Central Union (UCCU)
	1100 hrs	FM/Uganda Prison Farms
	1230 hrs	AA/West German Embassy (Embassy House, 5th Floor)
	1430 hrs	PS/Ministry of Cooperatives
	1600 hrs	(PS/Ministry of Industry and Technology)
Oct. 20	0830 hrs	ADO/USAID/KAMPALA
	0930 hrs	PS/CA/Ministry of Agriculture
	1130 hrs	PM/COU/Karamoja Seeds Project
	1430 hrs	AA/European Economic Community
	1600 hrs	GM/Produce Marketing Board
Oct. 21	0800 hrs	Leave for Masindi
	1230 hrs	Lunch
	1400 hrs	Meet MA/Uganda Seeds Project Officials and visit Processing Plant
	1600 hrs	Meet Masindi Seed Growers Association Committee Members
	1800 hrs	Go to Masindi Hotel for the night

<u>Date</u>	<u>Time</u>	<u>Activity</u>
Oct. 22	0800 hrs	Visit MA/Uganda Seeds Project Farm and Contract Seed Growers' Farmers
	1400 hrs	Lunch
	1700 hrs	Go to Masindi Hotel for the night
Oct. 23	0800 hrs	Visit Bunyoro Cooperative Union
	1030 hrs	Visit Isimba Prison Farm
	1230 hrs	Leave for Hoima
	1430 hrs	Leave for Fort Portal (Kabarole)
	1830 hrs	Go to Fortlands "House" for night
Oct. 24	0800 hrs	Leave for Kasese
	1200 hrs	Visit PMB Warehouse, Kasese
	1430 hrs	Leave for Mweya Safari Lodge
Oct. 25	0800 hrs	Visit places of interest in Queen Elizabeth (Rwenzori) National Park
	1300 hrs	Lunch
	1400 hrs	Leave for Mbarara
	1700 hrs	Go to New Ankole Hotel for night
Oct. 26	0800 hrs	Leave for Masaka
	1000 hrs	Meet DAO and DCO. Visit Government, Private and Cooperative Farmers in and around Masaka
	1500 hrs	Leave for Kampala
Oct. 27	0930 hrs	Kawanda meeting w/ breeders/others
	1430 hrs	Mr. Downer of UDC
	1530 hrs	Mr. Duncan of BAT
Oct. 28	0800 hrs	Meeting with CAAS Team in USAID
	0900 hrs	Meet with Church of Uganda on Karamoja Seed Scheme

<u>Date</u>	<u>Time</u>	<u>Activity</u>
Oct. 28	1000 hrs	Ringa Enterprises (Patrick Okumu)
	1430 hrs	PS/Ministry of Animal Industry
	1600 hrs	MCM (Min/PS)
Oct. 29	0930 hrs	Min/PS/Dep Min of Agr
	1000 hrs	Meeting with Seed Steering Committee
Nov. 2		Wellcome (Coopers) Ltd. (Francis X.S. Kitaka) Twiga Chemicals (Everest Kasaitia) Ciba-Geigy (C.M. Lwesanya and Mr. Lyagoba)
Nov. 3		Shell Uganda, Ltd. (Hugh Goldsmith and R.W. Jones) EEC (George Lambrinides and Karl Harvo) Miss Flavia Kabeere, Senior Seed Testing and Certification Officer, Uganda Seeds Project USAID Ken Lyvers and Floyd Spears
Nov. 5		E.J.R. (Ted) Hazelden, Project Manager Cargill Hybrid Seeds

## APPENDIX B

### List of References

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## APPENDIX C

### Brief Economic History of Uganda

At independence in 1962, Uganda had one of the strongest and most promising economies in sub-Saharan Africa. Despite the disadvantage of being a landlocked country, the agricultural sector, with favorable climatic and soil conditions, was able to provide ample food to feed the population as well as generate foreign exchange. Despite the fact that agricultural exports were dominated by coffee and cotton, rapid progress was being made on developing export crops such as tea and tobacco. The industrial sector, although small, supplied the economy with basic inputs and consumer goods, and contributed foreign exchange through exports of textiles and copper. Uganda's transport system was regarded as one of the best in sub-Saharan Africa, and through common services with Kenya and Tanzania, Uganda shared access to an effective network of railway, port and airline facilities. Although school enrollment was low, the country had developed quality education at all levels.

The initial years after independence clearly demonstrated Uganda's economic potential. Real GDP grew by 5.8% per annum from 1963 to 1970. The country also maintained a reasonable savings rate, averaging 15% of GDP, which permitted the implementation of a respectable investment program without undue pressure on domestic prices or the balance of payments. Although Uganda's export volumes grew slowly, at 3.5% per annum, export earnings were more than adequate to cover import requirements, and the country maintained a current account surplus in most years. The government's budgetary position was also basically sound.

Starting in 1970, a decade of political turmoil and gross economic mismanagement radically changed the situation. Many of the best trained personnel fled the country, the parastatal sector became bloated with abandoned industries, and professional standards within the sector were seriously eroded. In addition, Ugandan economy was shaken by a series of external shocks: a sharp rise in petroleum prices after 1973, and the breakup of the East African Community in 1977. As a result, real GDP declined by about 20% from 1972 to 1979. This era of extensive economic, social and political destruction culminated in a war in 1979 to overthrow the regime, entailing further destruction and economic decline.

The Ugandan economy proved resilient, however, and demonstrated its capacity to rebound quickly from prolonged economic contraction during 1981-84. Economic growth accelerated in response to changes in economic policy, supported with considerable donor assistance, including aid from the IBRD

and the IMF. These changes included a major depreciation of the Ugandan shilling, the removal of most price controls, and significant real increases for producer prices for export crops and petroleum. These measures stimulated agricultural production and exports, so that real GDP grew at an average rate of 6% during the three-year period ending 1984. There was a significant turnaround in budgetary performance, with the overall budget deficit falling from 9% of GDP during FY 81 to 3% in FY 83. There was also an improvement in the external accounts. In addition, the overall balance of payments was in surplus, and by mid-1984 foreign exchange reserves had reached the equivalent of three months of imports.

The fragility of this recovery, however, was revealed during 1984. With increasing political and military opposition, military expenditures escalated and fiscal and monetary control weakened. Expenditure overruns were significant, leading to a rise in the budget deficit and an acceleration of inflation. The exchange rate became significantly overvalued as the authorities intervened in the foreign exchange auction to slow the depreciation of the shilling. As a result, economic growth turned abruptly negative in 1984. The situation worsened further during 1985 as civil war led to a major disruption of productive activities and a severe shortage of foreign exchange. A resurgence of inflation sharply reduced the producer prices in real terms.

#### Economic Status Prior to the 1987 Reform

At the end of the civil war in January 1986, the economy was in a critical condition. Much of the country had been devastated; the Luwero triangle, once among the richest areas, was wasteland, with infrastructure destroyed. Countrywide, there was a major transport bottleneck; manufacturing plants were either closed or operating at low capacity; utilities had severely deteriorated. Official foreign exchange reserves were only \$24 million, equivalent to about two weeks of "normal" imports. The new government also inherited a considerable external debt burden. Taking into account the debt to the IMF, the total debt service scheduled for 1986 was equivalent to one half of the FY 84 exports. Moreover, by the end of 1985, the stock of external arrears on medium and long term debt amounted to \$63 million.

During 1986, the Ugandan government took major steps to re-establish peace and security and rehabilitate the economy. The government introduced discipline in both the army and in the general administration. Despite limited foreign aid at the

time, the government's emergency relief and rehabilitation program helped to revive economic activities in the war-torn areas. As a result, some recovery in real GDP occurred in 1986, particularly during the last half of the year. There was a significant improvement in value added from the non-monetary agricultural sector, and some increase in cash crop production. Commercial activity also made some recovery, although transport services remained weak. Manufacturing output has been slow to recover, as the lack of foreign exchange sharply limits supplies of spare parts and imported intermediate inputs. The shortage of foreign exchange constituted a major constraint to economic recovery, as the government had to use half of its limited foreign exchange earnings to import fuels and basic essential commodities, and the other half to finance debt service.

The budget for FY 86 sought to accelerate the country's recovery effort by doubling budgetary outlays over those of the previous year. With a smaller increase in projected revenues, the budget deficit increased, with most of its financing coming from the banking sector. The actual deficit was much larger than projected, due mainly to shortfalls in the government revenue. This arose primarily as a result of the overvalued exchange rate which severely penalized producers, while at the same time reduced revenues from coffee exports. As a result, fiscal and monetary performance deteriorated.

The government significantly increased the produce price of coffee in May 1986. In real terms, the new price was 45% above the average for FY 83, a peak year in terms of coffee deliveries to the marketing board. However, by April 1987 the real producer price dropped to 58% below the FY 83 average. Despite the acceleration in inflation, the nominal exchange rate remained fixed, and international coffee prices fell by 29%. A reduced export volume compounded the loss in revenue. Altogether, the average real value of total coffee export taxes in FY 86 fell to about 20% of the value in the previous year. Additional shortfalls resulted from depressed manufacturing output, which reduced revenues from sales taxes and excise duties, and compressed import levels, which reduced import duties and sales taxes.

Despite a cut in average real expenditures to nearly two-thirds of their level in FY 86, the budget deficit increased to 6.2% of GDP. To finance the deficit, the government borrowed heavily from the banking system. During FY 86, net domestic credit to the government rose by 230%. These developments, together with a rapid depreciation of the parallel market rate, led to an acceleration of inflation. By mid-1987, the average

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rate of inflation approached 250%.

In 1986, the balance of payments situation worsened. The shortage of transportation equipment severely hampered exports, particularly coffee, which accounted for 95% of total export earnings. As a result, Uganda was unable to reap full benefit from the boom in coffee prices and from the suspension of the ICO country quotas in February 1986. During 1986, imports increased by about 30% from the very low level of 1985. The government gave high priority to the importation of raw materials, spare parts, and transportation equipment urgently required to restore productive capacity and facilitate the movement of goods. With the fall in international prices, the value of petroleum imports decreased. Meanwhile, imports of key consumer goods such as sugar and salt increased significantly. Despite this increase the huge pent-up demand for imports could not be met, exerting considerable pressure on the parallel market. After a brief return to a dual exchange rate between June and August 1986, with rates of US\$ 1,400 and US\$ 5,000 per U.S. dollar (an adjustment in the wrong direction), by early 1987 the parallel market rate for the Ugandan shilling exceeded eight times the official exchange rate.

However, the worsening economic condition throughout 1986 made it clear to the government that a major reversal in economic policies was required. After extensive debate and study, there was broad consensus on the need for and direction of reform.

#### Outline of the 1987 Reform Program

The policy agenda of the government's Rehabilitation and Development Plan (Economic Recovery Program) entails measures designed to restore the stability of the economy and of policies to revitalize the economic recovery process, and sets the stage for sustained growth. The main components of this program were developed in collaboration with the IBRD and IMF in the context of a "Policy Framework Paper."

The objectives of the Economic Recovery Program, formally announced on May 15, 1987, are to: (1) restore price stability and a sustainable balance of payments position; (2) substantially improve capacity utilization in the industrial and agro-industrial sectors; (3) improve producer incentives; (4) restore discipline, accountability and efficiency in the public sector; and (5) improve public sector resource mobilization and allocation.

As an important first step toward these goals, the May 15 announcement included:

1. A currency reform under which one new Uganda Shilling would be equivalent to 100 old shillings;
2. A 77% devaluation, on foreign currency terms, of the Uganda Shilling from US\$ 1,400 (old) to one U.S. dollar to US\$ 60 (new) to one U.S. dollar;
3. A 30% currency conversion tax applicable to all cash holdings by the public; demand, savings and time deposits of households and business; all treasury bills and government stocks held by the public; and commercial bank cash balances with the Central Bank;
4. An increase of 182% in the producer prices for robusta coffee, 159% for arabica coffee, 375% for seed cotton, 280% for flue cured tobacco, 257% for fire cured tobacco, and 257% for green leaf tea;
5. Subsequent increases in producer prices of the five food crops targetted for export, ranging between 130 to 230% for beans, maize, sesame, groundnuts and soya beans;
6. An immediate increase in petroleum prices to establish appropriate parity with neighboring countries while providing net revenues to the Treasury;
7. A doubling of the civil service wage bill effective June 1, 1987.

In addition to these actions, the announcement included measures that will be taken in the coming months: establishment of an Open General Licensing (OGL) system for foreign exchange allocations and of a credit facility for local cover to finance imports, as well as implementing fiscal and monetary policies consistent with the objective of stabilization.

The policies announced by the government have been designed to accomplish a rapid return to economic stability. The government believes that the rate of inflation must come down quickly to enable markets and prices to play their allocative roles. To sustain stability and achieve recovery, policies aimed at restraining and controlling demand must now be supported by measures to stimulate the supply-side of the economy. In the short run, the government expects a significant supply response from improved producer prices in the agricultural sector, increased capacity utilization in industry, and larger numbers of transport vehicles within the marketing sector. Experience in the 1981-84 period, when the economy rebounded from prolonged contraction, supports this expectation. To sustain the expected recovery, the rehabilitation of basic infrastructure as well as productive capacity is essential.

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### Macro-economic Policies

Macro-economic policy in Uganda is dominated by short term problems of stabilization. Stabilization is a necessary first step toward the creation of a policy environment conducive to rapid growth with an equitable distribution of benefits. The government's recent initiatives, and the complementary policies to be pursued, are aimed at stabilizing the economy over the next 18 months. The following are principal objectives and/or provisions in the GOU's new economic policy program:

- o restrict the expansion in money supply to control the growth in nominal aggregate demand;
- o release credit resources (from reduced credit to the government) for the expansion of the private sector;
- o price incentives to agricultural producers to expand exports, and to help finance critically needed imported agricultural inputs;
- o restoration of financial discipline with price stability;
- o reducing the fiscal deficit without recourse to monetary expansion, with an overall FY 87 budget deficit limited to 4.5% of GDP;
- o increased coffee export duty, plus an expected improvement in general tax collection and administration;
- o reduction in recurrent expenditure from 7.3% of GDP in FY 86 to 6.9% in FY 87; to be achieved from a largely projected recovery in real GDP growth;
- o reducing defense expenditure in real terms in the FY 87 budget;
- o recurrent revenues are expected to grow more rapidly than recurrent expenditures, reversing the trend of net negative savings by the public sector (approaching 4% of GDP in FY 87);
- o reducing inflation while increasing output is a fundamental goal of short run economic policy; inflation is expected to decline from an annual rate of 250% in FY 86 to about 90% in FY 87 and to less than 30% in FY 88;
- o as a priority, establishing and maintaining a realistic exchange rate; the exchange rate system is to be anchored on appropriate monetary policies and strict fiscal discipline;
- o the GOU is introducing a limited open general licensing system, under which import licenses and foreign exchange will be provided freely upon request; currently, exchange is administratively allocated;
- o gradually liberalize the marketing and export arrangements for agricultural commodities; when economic conditions improve, the GOU intends to allow private exporters to

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- export;
- o emphasis is being placed on provision of imported inputs to rehabilitate both agricultural and industrial enterprises;
  - o continue to pursue a policy whereby domestic prices are market determined;
  - o with donor support, major efforts are currently underway to improve road conditions and maintenance capacity.

Source: F. Winch, USAID/Kampala, 1987.

APPENDIX D  
Articles of Incorporation  
of a Seed Company

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Mr. Alexander Grobman,  
Industrial Council for Development,  
C/o USAID,  
KAMPALA.

29th October, 1987

Dear Sir,

RE: FORMATION OF A SEED COMPANY.

This is to confirm our discussions on the above subject when you called on the undersigned on 28th October, 1987.

You explained to us that I.C.D is interested in incorporating a company whose object would be to engage in seed research, production, marketing, distribution, export etc. Its shareholders are expected to be both local and foreign. You specifically wanted us to advise on the best form of incorporation for such a company.

A private company is of three types under the companies Act (Cap.85) viz.

- (a) A company limited by shares where the liability of members is limited by the memorandum to the amount unpaid on their shares.
- (b) A company limited by guarantee where the liability of members is limited by the memorandum to such amount as the members may respectively undertake to contribute to the assets of the company in the event of its being wound up.
- (c) A company not having any limit on the liability of its members, which is termed "an unlimited company."

One can also form a public company where the public is invited to purchase shares in its equity.

We recommended that a private company limited by shares would be more ideal for your purposes. Such company is incorporated by registering with the Registrar of Companies a memorandum and articles of its association.

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You instructed us to find out if the name of "Uganda Seed Co. Ltd" was available for registration and also to prepare:-

- (a) the objects and articles of association of such company in general outline for collection on Thursday, 29th October, 1987.
- (b) A comprehensive memorandum and articles of association in draft form for collection on Thursday, 3rd November, 1987.

The outline is attached herewith.

Yours faithfully,

for MULIRA & CO,  
ADVOCATES.

PROPOSED OBJECT OF UGANDA SEED  
COMPANY LIMITED

1. The name of the Company is: UGANDA SEED CO. LTD"
2. The registered office of the company shall be situate in the Republic of Uganda.
3. The objects for which the company is formed are:-
  - (a) To acquire, take over, promote, establish, and carry on all or any of seed producers and reasearchers, manufacturers of linseed cotton and other cokes, coke and oil manufacturers, manufacturers of floor cloths and floor coverings of every description.
  - (b) To establish or acquire and carry on office, trading stations, factories and depots in Uganda or elsewhere, and to purchase, lease or otherwise acquire, carry on, develop and improve any business, or any undivided or other interest;
  - (c) To buy, sell manufacture, repair, alter and otherwise deal in apparatus, plant, machinery, materials, products and things of all kinds capable of being used for the purposes of the above mentioned business;
  - (d) To carry on any other business as the Directors of the company may deem fit;
  - (e) To apply for, acquire and hold any charters, privileges, monopolies, licences, or other rights from Government or local authorities;
  - (f) To provide increased facilities for the storage, warehousing, carriage and distribution of seeds and seed products.
  - (g) To manufacture, buy, sell and generally deal in, any plant, machinery, tools goods or things of any description which in the opinion of the company may be conveniently dealt with by the company in connection with any of its objects.
  - (h) To build, construct, maintain, alter, enlarge, pull down, remove or replace any buildings, works, plant and machinery necessary or convenient for the business of



the company or to join with any person, firm or company in doing any of the things aforesaid; to purchase, take on lease, exchange, hire or otherwise acquire and hold for any estate or interest any real or personal property and any rights or privileges which the company may think necessary or convenient for the purposes of its business.

- (i) To borrow or raise or secure the payment of money or the performance of obligations in such manner and upon such terms as may seem expedient and to ensure the repayment or performance thereof, by redeemable or irredeemable bonds, debentures and debenture stock (such bonds, debentures and debenture stock being made payable to bearer or otherwise and issuable or payable either at par or at a premium or discount) or by mortgages, scrip certificates, bills of exchange or promissory notes or by any other instrument or in such other manner as may be determined and for any such purposes to charge all or any part of the property of the company both present and future, including its uncalled capital and to allot the shares of the company credited as fully or partly paid up or bonds, debentures or debenture stock issued by the company as the whole or part of the purchase price for any valuable consideration.
- (j) To guarantee the payment of money secured by or payable under or in respect of bonds, debentures, debenture stock contract, mortgages, charges, obligations and securities of any company or of any authority, supreme, municipal, local or otherwise or of any persons whomsoever whether corporate or unincorporate.
- (k) To furnish and provide deposits and guarantee funds, require in relation to any order or application for any contract, concession, decree, enactment property or privilege or in relation to the carrying out of any contract, concession, decree or enactment, property generally to carry on and transact every kind of guarantee business and to undertake obligations of every kind and description and also to undertake and execute trusts of all kinds.

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- (l) To invest the money of the company in such manner as may from time to time be determined.
- (m) To lend money to such parties and on such terms, with or without security as may deem expedient and in particular to customers of and persons having dealings with the company and to guarantee the repayment of money and the performance of contracts, by members of or companies or persons having dealings with the company, and to draw, accept, endorse, discount, issue, sell, buy and deal in bills of lading, coupons, warrants and buy, sell and deal in bullion, specie and coins.
- (n) To carry on the business and to act as trade consultants, merchants, bankers, traders, commission agents ship-owners, carriers or in any other capacity in Uganda or elsewhere and import, export, buy, sell, barter exchange, pledge, make advances upon or otherwise deal in goods, produce, articles and merchandise.
- (o) To carry on business relating to the administration and organisation of industry and business of industrial business and personal consultants and to advise upon the means and methods for extending developing and improving all types of business or industries and all systems or process relating to the production, storage, distribution, marketing and sale of goods and or relating to the rendering of services.
- (p) To act as agents or managers on carrying on any business concerns and undertakings and to employ experts to investigate and examine into the conditions, management prospects, value and circumstances of any business, concern and undertakings and generally of any assets property or rights of any kind.
- (q) To make donations to such persons and in such cases either in cash or other assets, as may be thought directly or indirectly conducive to any of the company's objects or otherwise expedient and to grant pensions, allowances, gratuities and business to any officers or ex-officers or employees or ex-employees (including directors and former directors) of the company or its predecessors in business or the dependants of such persons and to subscribe or guarantee money for charitable or benevolent objects or for any exhibition or for any public, general or other object.



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- (r) To grant pensions, allowances, gratuities and bonuses to the officers, ex-officers including directors and ex-directors) employee or ex-employees of the company or of any subsidiary, allied or associated company or of the predecessors in business of all or any of them or the families, dependants or connections of such persons and to make payments towards insurance and to establish or support or aid in the establishment and support of associations, institutions, clubs, fund trusts and schemes calculated to benefit such persons.
- (s) To pay all costs, charges and expenses incurred or sustained in or about the promotion and establishment of the company or which the company shall consider to be in the nature of preliminary expenses including therein the cost of advertising, commissions for underwriting, brokerage, printing and stationery and the legal and other expenses of the promoters.
- (t) To draw, make, accept, endorse, discount, negotiate, execute and issue, promissory notes, bills of exchange, bills of lading, script, warrants and other transferable or negotiable instrument.
- (u) To distribute any of the assets of the company among the members in specie or otherwise or amongst such other persons or companies as may be deemed expedient
11. (a) To procure the company to be registered or recognized in any Commonwealth or foreign country or place.
- (b) To do all or any of the above things in any part of the world either as principals, agents, contractors, trustees or otherwise and either alone or in conjunction with others, either or through managers, managing agents, agents, sub-contractors, trustees or otherwise, with power to appoint a trustee or trustees personal or corporate, to hold any property on behalf of the company and to allow any property on behalf of the company and to allow any property to remain outstanding in such trustee or trustees.
- (c) To do all such other things as are incidental or may be thought conducive to the attainment of the above objects or any of them and so that the word "Company" in this Memorandum when applied otherwise
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than to this company shall be deemed to include any partnership or other body or persons, whether corporate or incorporate and whether domiciled in the Republic of Uganda or elsewhere.

AND IT IS HEREBY DECLARED that:-

(a) The word "Company" in this clause except where used in reference to this Company shall be deemed to include a partnership or other body or persons whether corporate or incorporate and whether domiciled in Uganda or elsewhere.

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(b) The objects specified in each of the paragraphs of this clause shall in no time be limited or restricted (except where otherwise expressed in such paragraph) by reference to or inference from the terms of any other paragraph (or the name of the Company) but may be carried out in as fully and ample a manner and construed in as wide a sense as if each and the said paragraphs defined the objects of a separate and distinct company.

THE LIABILITY OF THE MEMBERS IS LIMITED.

The share capital of the company is Shs: \_\_\_\_\_ divided into \_\_\_\_\_ shares of Shs: \_\_\_\_\_ each with power for the company to increase or reduce the said capital and to issue any part of its capital, original or increased, with or without any preferential priority or special privileges or subject to any postponement of rights or to any conditions or restrictions in so that unless the conditions of issue shall otherwise expressly declare, every issue of shares, whether declared to be preference or otherwise shall be subject to the powers hereinbefore contained.

We, the several persons whose names, postal addresses and occupations are hereto subscribed are desirous of being formed into a company in pursuance of this Memorandum of Association and we respectively agree to take the number of shares in the capital of the company set opposite our respective names.

**Best Available Document**

# **The Companies Act**

**(Cap. 85 of the Laws of Uganda)**

**Company Limited by Shares**

## **MEMORANDUM AND ARTICLES OF ASSOCIATION**

**OF**

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**UGANDA SEED COMPANY LIMITED**

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**Drawn and Presented by**

**MULIRA & Co.**

**Advocates**

**Bauman House Plot No. 7 Parliament Avenue  
Tel: 242299  
Kampala Uganda East Africa  
Telegrams AUXILIUS**

THE COMPANIES ACT

(CAP 85 of the Laws of Uganda)

COMPANY LIMITED BY SHARES

MEMORANDUM OF ASSOCIATION

OF

UGANDA SEED CO LIMITED

1. The name of the Company is: "UGANDA SEED CO.LIMITED."
2. The registered office of the Company will be situate in the Republic of Uganda.
3. The objects for which the Company is established are:
  - (a) To acquire, take over, promote, establish and carry on the business of seed researchers, growers, and merchants, oil extractions by crushing, chemical or any other processes, museryners carriers by sea and land and warehousemen;
  - (b) To establish or acquire and carry on offices, trading stations, factories and depots in Uganda or elsewhere, and to purchase, lease or otherwise acquire, carry on, develop and improve any business, or any undivided or other interest;
  - (c) To buy, sell, manufacture, repair, alter and otherwise deal in apparatus, plant, machinery, material, products and things of all kinds capable of being used for the purposes of the above mentioned business;
  - (d) To carry on any other business as the Directors of the Company may deem fit;

- (e) To apply for, acquire and hold any charters, privileges, monopolies, licences, or other rights from Government or local authorities;
- (f) To provide increased facilities for the storage, housing carriage and distribution of seeds and seed products;
- (g) To act as agents of any government and other authority, and for public and private bodies and persons.
- (h) To manufacture, buy, sell and generally deal in, any plant, machinery, tools goods or things of any description which in the opinion of the Company may be conveniently dealt with by the Company in connection with any of its objects.
- (i) To build, construct, maintain, alter, enlarge, pull down, remove or replace any buildings, works, plant and machinery necessary to convenient for the business of the Company or to join with any person, firm or company in doing any of the things aforesaid; to purchase, take on lease, exchange, hire or otherwise acquire and hold for any estate or interest any real or personal property and any rights or privileges which the Company may think necessary or convenient for the purposes of its business.
- (j) To borrow or raise or secure the payment of money or the performance of obligations in such manner and upon such terms as may seem expedient and to secure the repayment or performance thereof, by redeemable or irredeemable bonds, debentures and debenture stock (such bonds, debentures and debenture stock being made payable to bearer or otherwise and issuable or payable either at par or at a premium or discount) or by mortgages, scrip certificates,

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bills of exchange or promissory notes or by any other instrument or in such other manner as may be determined and for any such purposes to charge all or any part of the property of the Company both present and future, including its uncalled capital and to allot the shares of the Company credited as fully or partly paid up or bonds, debentures or debenture stock issued by the Company as the whole or part of the purchase price for any valuable consideration.

- (k) To guarantee the payment of money secured by or payable under or in respect of bonds, debentures, debenture stock contract, mortgages, charges, obligations and securities of any company or of any authority, supreme, municipal, local or otherwise or of any persons whomsoever whether corporate or unincorporate.
- (l) To furnish and provide deposits and guarantee funds, required in relation to any order or application for any contract, concession, decree, enactment, property or privilege or in relation to the carrying out of any contract, concession, decree, or enactment generally to carry on and transact every kind of guarantee business and to undertake obligations of every kind and description and also to undertake and execute trusts of all kinds.
- (m) To invest the money of the Company in such manner as may from time to time be determined.
- (n) To lend money to such parties and on such terms, with or without security as may seem expedient and in particular to customers of and persons having dealings with the



Company and to guarantee the repayment of money and the performance of contracts, by members of or companies or persons having dealings with the Company, and to draw, accept, endorse, discount, issue, sell, buy, sell and deal in bullion, specie and coins.

- (o) To carry on the business and to act as trade consultants, merchants, bankers, traders, commission agents ship-owners, carriers or in any other capacity in Uganda or elsewhere and import, export, buy, sell, barter exchange, pledge, make advances upon or otherwise deal in goods, produce, articles and merchandise.
- (p) To carry on business relating to the administration and organisation of industry and business of industrial business and personal consultants and to advise upon the means and methods for extending developing and improving all types of business or industries and all systems or process relating to the production, storage, distribution, marketing and sale of goods and or relating to the rendering of services.
- (q) To act as agents or managers in carrying on any business concerns and undertakings and to employ experts to investigate and examine into the conditions, management prospects, value and circumstances of any business, concern and undertakings and generally of any assets, property or rights of any kind.
- (r) To make donations to such persons and in such cases either in cash or other assets, as may be thought directly or indirectly conducive to any of the Company's objects or otherwise expedient and to grant pensions,

allowances, gratuities and business to any officers or ex-officers or employees or ex-employees (including directors and former directors) of the Company or its predecessors in business or the dependants of such persons and to subscribe or guarantee money for charitable or benevolent objects or for any exhibition or for any public, general or other object.

- (s) To grant pensions, allowances, gratuities and bonuses to the officers, ex-officers, (including director and ex-directors) employee or ex-employees of the Company or of any subsidiary, allied or associated company or of the predecessors in business of all or any of them or the families, dependants or connections of such persons and to make payments towards insurance and to establish or support or aid in the establishment and support of associations, institutions, clubs, fund trusts and schemes calculated to benefit such persons.
- (t) To pay all costs, charges and expenses incurred or sustained in or about the promotion and establishment of the Company or which the Company shall consider to be in the nature of preliminary expenses including therein the cost of advertising, commissions for underwriting, brokerage, printing and stationery and the legal and other expenses of the promoters.
- (u) To draw, make, accept, endorse, discount, negotiate, execute and issue, promissory notes, bills of exchange, bills of lading, script, warrants and other transferable or negotiable instrument.

- (v) To distribute any of the assets of the Company among the members in specie or otherwise or amongst such other persons or companies as may be deemed expedient.
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- (a) To procure the Company to be registered or recognised in any Commonwealth or foreign country or place.
  - (b) To do all or any of the above things in any part of the world either as principals, agents, contractors, trustees or otherwise and either alone or in conjunction with others, either or through managers, managing agents, agents, sub-contractors, trustees or otherwise, with power to appoint a trustee or trustees personal or corporate, to hold any property on behalf of the company and to allow any property to remain outstanding in such trustee or trustees.
  - (c) To do all such other things as are incidental or may be thought conducive to the attainment of the above objects or any of them and so that the word "Company" in this Memorandum when applied otherwise than to this Company shall be deemed to include any partnership or other body or persons, whether corporate or incorporate and whether domiciled in the Republic of Uganda or elsewhere.

AND IT IS HEREBY DECLARED THAT:

- (a) The word "Company" in this clause except where used in reference to this Company shall be deemed to include a partnership or other body or persons whether corporate or incorporate and whether domiciled in Uganda or elsewhere;

and

(b) The objects specified in each of the paragraphs.

THE LIABILITY OF THE MEMBERS IS LIMITED

The share capital of the Company is ..... divided into  
\_\_\_ shares of ..... each with power for the Company to increase  
or reduce the said capital and to issue any part of its capital,  
original or increased, with or without any preferential, priority  
or special privileges or subject to any postponement or rights or  
to any conditions or restrictions in so that unless the conditions  
of issue shall otherwise expressly declare, every issue of shares,  
whether declared to be preference or otherwise shall be subject to  
the powers hereinbefore contained.

WE, the several persons whose names, postal addresses and occupa-  
tions are hereto subscribed are desirous of being formed into a  
Company in pursuance of this Memorandum of Association and we  
respectively agree to take the number of shares in the capital of  
the Company set opposite our respective names.

NAMES, POSTAL ADDRESSES AND OCCUPATIONS OF SUB- SCRIBER	NO. OF SHARES TAKEN BY EACH SUBSCRIBER	SIGNATURES OF SUBSCRIBERS
1.		
2.		

DATED the \_\_\_\_\_ day of \_\_\_\_\_ 1987.

WITNESS of the above signatures:-

MESSRS MULIRA & COMPANY  
ADVOCATES  
123 BAUMANN HOUSE  
7 OROTE AVENUE  
P. O. BOX 182  
KAMPALA.

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# THE COMPANIES ACT

(CAP. 85 of the Laws of Uganda)

## ARTICLES OF ASSOCIATION

OF

## UGANDA SEED CO., LIMITED

PRELIMINARY

### TABLE A

1. The regulations in Table A in the First Schedule to the Companies Act shall not apply to the Company except so far as the same are repeated or contained in these Articles, or are specifically adopted.

### INTERPRETATION

2. In these Articles the words standing in the first column of the Table next hereinafter contained shall bear the meaning set opposite to them respectively in the second column there-of, if not inconsistent with the subject or context:-

Word		Meaning
The Act	-	The Companies Act (Cap. 85)
The Statutes	-	The Companies Act, and every other Act for the time being in force concerning joint stock companies and affecting the Company.
The Articles	-	These Articles of Association and the regulations of the Company for the time being in force.
The Register	-	The register of Members of the

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		Company.
The Office	-	The registered office of the Company.
The Seal	-	The Common Seal of the Company.
Month	-	Calendar Month
Paid Up	-	Includes credited as paid up.
Dividend	-	Includes bonus.
In Writing	-	Written or printed or produced by any substitute for writing or printing
The Board	-	The Board of Directors for the time being of the Company.

Words importing the singular number only shall include the plural number, and vice versa.

Words importing the masculine gender only shall include the feminine gender.

Words importing persons shall include corporations.

Subject as aforesaid, any words or expressions defined in the Statutes shall, if not inconsistent with the subject or context, bear the same meanings in these Articles.

#### BUSINESS

3. The Company is a Private Company within the meaning of section 30 of the Act, and accordingly:-

(a) No invitation shall be issued to the public to subscribe for any shares or debentures of the Company.

(b) The number of members of the Company (not including persons who are in the employment of the Company and persons

who, having been formerly in the employment of the Company, were while in that employment and have continued after the determination of that employment to be members of the Company), shall be limited to fifty, provided that, for the purposes of this provision, where two or more persons hold one or more shares in the Company jointly, they shall be treated as a single member; and

(c) The right to transfer the shares of the Company is restricted in manner and to the extent hereinafter appearing.

4. No part of the funds of the Company shall be employed in the purchase of or in loans upon the security of the Company's shares, save so far as may be authorised by the Statutes.

5. Any branch or kind of business which the Company is either expressly or by implication authorised to undertake may be undertaken by the Company at such time or times as the Board shall think fit, and further, may be suffered by the Board to be in abeyance, whether such branch or kind of business may have been expedient not to commence or proceed with such branch or kind of business.

6. The office shall be at such place as the Board shall from time to time appoint.

#### SHARE CAPITAL AND SHARES

7. (1) The Share capital of the company is Shs.....divided into.....preference shares of shs..... each and ..... ordinary shares of shs.....each.

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(2) The following rights shall be attached to the shares aforesaid inter se subject as hereinafter provided namely:

(a) The profits of the Company, which the directors of the Company shall from time to time determine to distribute as dividend, shall be applied first in payment of a fixed preferential dividend at the rate of ..... per cent per annum on the preference shares according to the amounts paid up thereon and subject thereto in payment of a dividend on the ordinary shares according to the amounts paid up thereon.

(b) In a winding up, the assets of the Company (including capital uncalled at the commencement of the winding up) remaining after paying and discharging the debts and liabilities of the Company and the costs of the winding up, shall be applied in the following order of priority:

(i) in repayment of capital paid up or credited as paid up on the preference shares;

(ii) in payment to the holders of the preference shares of all arrears of dividend on the preference shares up to the commencement of the winding up.

(iii) in repayment of the capital paid up or credited as paid up on the ordinary shares, and the residue (if any) shall be divided amongst the holders of the ordinary shares in proportion to the amount paid up on such shares.

B. Subject to any special rights to be attached to shares in any increased capital, the profits determined to be distributed by way of dividend and all surplus assets in a winding up shall be distributable amongst the holders of the Ordinary Shares in

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proportion to the capital paid up or credited as paid up on the Ordinary Shares held by them respectively.

9. Without prejudice to any special rights previously conferred on the holders of any shares or class of shares already issued (which special rights shall not be modified or abrogated by Article 15 hereof), any share in the Company (whether forming part of the original capital or not) may be issued with such preferred, deferred or other special rights, or such restrictions whether in regard to dividend, return of capital, voting or otherwise, as the Company may from time to time by resolution determine, and subject to the provisions of the Act the Company may issue preference shares which are, or which at the option of the Company are to be liable, to be redeemed.

10. The Company may, upon any offer of shares, pay a commission to any person in consideration of his subscribing or agreeing to subscribe, whether absolutely or conditionally, for any of such shares in the Company, or procuring or agreeing to procure subscriptions whether absolute or conditional or guarantees of subscriptions for any of such shares in the Company, and in addition to the above may pay a brokerage upon all or any part of its shares subscribed for through the intervention of a broker or banker, but so that the commission and brokerage, if any shall together not exceed 10 per cent of the nominal value of each share. The Company may employ for the purpose of placing its shares under this Article any person it may think fit, including in particular any vendor, promoter, Director or other officer of the Company, and no such person shall be under any liability to account to the Company, its

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members or creditors, for any profits made thereby. Any commission or brokerage becoming payable under the exercise of the powers conferred by this Article may be paid in cash or in shares, or partly in one mode and partly in the other, as the Company may think fit, and any Director of the Company may receive or otherwise be interested in any such commission and/or brokerage, or any commission or brokerage for underwriting, guaranteeing, or taking up any debentures, debenture stock or loan capital and may lend money to the Company at interest.

11. Where any shares are issued for the purpose of raising money to defray the expenses of the construction of any works or buildings or the provision of any plant which cannot be made profitable for a lengthened period, the Company may pay interest on so much of such share capital as is for the time being paid up for the period and subject to the conditions and restrictions mentioned in section 67 of the Act, and may charge the same to capital as part of the cost of the construction of the works, buildings or plant.

12. Subject to any direction given by resolution of the Company in General Meeting, the shares shall be at the disposal of the Board, and it may allot, grant options over, or otherwise deal with or dispose of them to such persons at such times and generally on such terms and conditions as it thinks proper, but so that no shares shall be issued at a discount, except in accordance with section 39 of the Act.

13. If two or more persons are registered as joint holders of any share, one of such persons may give effectual receipts for any dividends, bonuses or other moneys payable in respect of such share.

14. No person shall be recognised by the Company as holding any share upon any trust, and the Company shall not be bound by or recognise any equitable, contingent, future or partial interest in any share or any interest in any fractional part of a share, or (except only as by these Articles otherwise expressly provided or as by the Statutes required or under an order of Court) any other right in respect of any share, except an absolute right to the entirety thereof in the registered holder.

#### SHARE CERTIFICATES

15. Every person whose name is entered as a member in the register shall without payment be entitled to receive within two months after allotment or lodgment of transfer, or within such other period as the conditions of issue shall provide, a certificate under the seal specifying the shares allotted or transferred to him and the amount paid up thereon, provided that in the case of joint holders the Company shall not be bound to issue more than one certificate to all the joint holders, and delivery of such certificate to any one of them shall be sufficient delivery to all.

16. If any such certificate shall be worn out, defaced, destroyed, or lost, it may be renewed on such evidence being produced as the Board shall require, and in case of wearing out, defacement or delivery up of the old certificate and in case of destruction or

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loss on execution of such indemnity (in any' and in either case on payment of such sum, not exceeding five shillings, as the Board may from time to time require. In case of destruction or loss the member to whom such renewed certificate is given shall also bear and pay to the Company all expenses incidental to the investigation by the Company of the evidence of such destruction or loss and to such indemnity.

#### MODIFICATION OF RIGHTS

17. Whenever the capital of the Company is divided into different classes or groups of shares, the special rights attached to any class or group may, subject to the provisions of the Statutes, either with the consent in writing of the holders of three-fourths of the issued shares of the class or group or with the sanction of an Extraordinary Resolution passed at a separate General Meeting of such holders (but not otherwise), be modified or abrogated and may be so modified or abrogated wither whilst the Company is a going concern or during or in contemplation of a winding up. TO every such separate General Meeting all the provisions of these Articles relating to General Meetings or to the proceedings thereat shall mutatis mutandis apply, except that the necessary quorum shall be two persons at least holding or representing by proxy one-third of the nominal amount of the issued shares of the class or group (but so that if at any adjourned meeting of such holders a quorum as above defined is not present those members who are present shall be a quorum) and that the holders of shares of the class or group shall on a poll have one vote in respect of every share of the class or group held by these respectively. The special rights conferred upon the holders of any shares or class or group of

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shares issued with preferred or other special rights shall not, unless otherwise expressly provided by the conditions of issue of such shares, be deemed to be modified by the creation or issue of further shares ranking pari passu therewith.

#### LIEN

18. The Company shall have a first and paramount lien on every share for all moneys (whether presently payable or not) called or payable at a fixed time in respect of that share, and the Company shall also have a lien on all shares standing registered in the name of a single person for all moneys presently payable by him or his estate to the Company; the Board may at any time declare any share to be wholly or in part exempt from the provisions of this regulation. The Company's lien, if any, on a share shall extend to all dividends payable thereon.

19. The Company may sell, in such manner as the Board thinks fit, any shares on which the Company has a lien, but no sale shall be made unless such sum in respect of which the lien exists is presently payable, nor until the expiration of fourteen days after a notice in writing, stating and demanding payment of such part of the amount in respect of which the lien exists as is presently payable, has been given to the registered holder for the time being of the share, or the person entitled thereto by reason of the death or bankruptcy of the registered holder.

20. For giving effect to any such sale the Board may authorise some person to transfer the shares sold to the purchaser thereof. The purchaser shall be registered as the holder of the shares

comprised in any such transfer and he shall not be bound to see to the application of the purchase money nor shall his title to the shares be affected by any irregularity or invalidity in the proceedings in reference to the sale.

21. The proceeds of the sale shall be received by the Company and applied in payment of such part of the amount in respect of which the lien exists as is presently payable and the residue shall (subject to a like lien for sums not presently payable as existed upon the shares prior to the sale) be paid to the person entitled to the shares at the date of the sale.

#### CALLS ON SHARES

22. The Board may, subject to the provisions of these Articles and to any conditions of allotment, from time to time make such calls upon the shareholders in respect of all moneys unpaid on their shares as it thinks fit, provided that fourteen days' notice at least is given of each call and that no call shall be payable at less than one month from the period fixed for the payment of the last proceeding call and each shareholder shall be liable to pay the amount of every call so made upon him to the persons and at the times and places appointed by the Board. A call may be made payable by instalments. A call shall be deemed to have been made as soon as the resolution of the Board authorising such call shall have been passed.

23. The joint holders of a share shall be jointly and severally liable to pay all calls in respect thereof.

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24. If before or on the day appointed for payment thereof a call payable in respect of a share is not paid, the person from whom the call is due shall pay interest on such amount at the rate of 8 per cent per annum from the day appointed for payment thereof to the time of actual payment, but the Board shall have power to remit such interest or any part thereof.

25. Any sum which by the terms of allotment of a share is made payable upon allotment or at any fixed date and any instalment of a call shall, for all purposes of these Articles, be deemed to be a call duly made payable on the date fixed for payment, and in case of non-payment the provisions of these Articles, as to payment of interest and expenses, forfeiture and the like, and all other relevant provisions of the Act or of these Articles, shall apply as if such sum were a call duly made and notified as hereby provided.

26. The Board may, from time to time make arrangements on the issue of shares for a difference between the holders of such shares in the amount of calls to be paid and in the time of payment of such calls.

27. The Board may, if it thinks fit, receive from any shareholder willing to advance the same, all or any part of the moneys due upon his shares beyond the sums actually called up thereon, and upon all or any of the moneys so advanced the Board may, until the same would, but for such advance, become presently payable, pay or allow such interest, not exceeding, without the consent of a General Meeting, 10 per cent per annum, as may be agreed upon between it and such shareholder, in addition to the dividend payable upon such

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advance has been made as is actually called up. No sum paid up in advance of calls shall entitle the holder of a share in respect of any period prior to date upon which such sum would, but for such payment, have become presently payable.

28. No shareholder shall be entitled to receive any dividend or to be present or vote at any meeting or upon a poll or to exercise any privilege as a member until he shall have paid all calls for the time being due and payable on every share held by him, whether alone or jointly with any other person, together, with interest and expenses (if any).

#### TRANSFER OF SHARES

29. All transfers of shares may be effected by transfer in writing in the usual common form under hand only.

30. The instrument of transfer of a share shall be signed by or on behalf of the transferer and transferee and the transferer shall be deemed to remain the holder of the share until the name of the transferee is entered in the register in respect thereof. Shares of different classes shall not be transferred by the same instrument of transfer without the consent of the Board.

31. The Board may, in its absolute discretion, and without specifying any ground, refuse to register a transfer of any share to any person whom it shall in its opinion consider to be undesirable in the interests of the Company to admit to membership. No transfer shall be registered if by reason thereof the number of members would exceed the limit herein before prescribed.

32. The Board may refuse to register any transfer of a share where the Company has a lien on the share.

33. If the Board refuses to register a transfer it shall within two months after the date on which the transfer was lodged with the Company send to the transferee notice of the refusal.

34. The Board may decline to recognise any instrument of transfer unless:-

- (a) such fees, not exceeding ten shillings, as the Board may from time to time require, is paid to the Company in respect thereof; and
- (b) the instrument of transfer is deposited at the office or such other place as the Board may appoint, accompanied by the certificate of the shares to which it relates, and such other evidence as the Board may reasonably require to show the right of the transferer to make the transfer.

35. The Board may waive production of any certificate upon evidence satisfactory to it of its loss or destruction.

36. There shall be paid to the Company in respect of the registration of any probate, letters of administration, certificate of marriage or death, power of attorney or other document relating to or affecting the title to any shares, such fee, not exceeding ten shillings, as the Board may from time to time require or prescribe.

37. Nothing herein contained shall preclude the Board from recognising a renunciation of the allotment of any share by the allottee in favour of some other person.

38. The transfer books and register of members and debenture holders shall be closed during such time as the Board thinks fit, not exceeding in the whole thirty days in each year.

#### TRANSMISSION OF SHARES

39. In case of the death of a shareholder the survivors or survivor where the deceased was a joint holder, and the executors, administrators of the deceased where he was a sole or only surviving holder, shall be the only persons recognised by the Company as having any title to his shares, but nothing herein contained shall release the estate of a deceased holder (whether sole or joint) from any liability in respect of any share solely or jointly held by him.

40. Subject to any other provision of these Articles, any person becoming entitled to a share in consequence of the death or bankruptcy of a member may, upon such evidence as to his title being produced as may from time to time be required by the Board,

and subject as hereinafter provided, be registered himself as holder of the share or elect to have some person nominated by him registered as the transferee thereof.

41. Subject to any other provisions of these Articles, if the person so becoming entitled shall elect to be registered himself, he shall deliver or send to the Company a notice in writing signed by him stating that he so elects. If he shall elect to have his nominee registered he shall testify his election by executing to his nominee a transfer of such share. All the limitations, restrictions and provisions of these Articles relating to the right to transfer and the registration of transfers of shares shall be applicable to any such notice or transfer as aforesaid as if the death or bankruptcy of the member had not occurred and the notice or transfer were a transfer executed by such member.

42. A person becoming entitled to a share in consequence of the death or bankruptcy of a member shall be entitled to receive and may give a good discharge for all dividends and other moneys payable in respect thereof, but shall not be entitled to receive notices of or to attend or vote at meetings of the Company, or save as aforesaid, to any of the rights or privileges of a member until he shall have become a member in respect of the share.

#### FORFEITURE OF SHARES

43. If any member fails to pay the whole or any part of any call on or before the day appointed for the payment thereof the Board may at any time thereafter during such time as the call, or any part thereof, remains unpaid, together with any accrued interest

and any expenses incurred by the Company by reason of such non-payment.

44. The notice shall name a further day (not being less than fourteen days from the date of the notice) on or before which such call, or such part thereof as aforesaid, and all such interest and expenses as aforesaid, are to be paid. It shall also name the place where payment is to be made, and shall state that in the event of non-payment, at or before the time and at the place appointed, the shares in respect of which such call was made will be liable to be forfeited. But notwithstanding any such notice the Board may waive payment of the whole or any portion of such interest and expenses if it considers it expedient to do so.

45. If the requirements of any such notice as aforesaid are not complied with, any share in respect of which such notice has been given may at any time thereafter, before payment of all calls, interest and expenses due in respect thereof has made, be forfeited by a resolution of the Board of that effect.

46. A forfeiture of shares under the preceding Article shall include all dividends declared in respect of the forfeited shares not actually paid before the forfeiture.

47. Where any share has been forfeited in accordance with these Articles, notice of the forfeiture shall forthwith be given to the holder of the share, or the person entitled to the share by transmission, as the case may be, and in an entry of such notice

having been given, and of the forfeiture with the date thereof, shall forthwith be made in the register opposite to the entry of the share; but no forfeiture shall be in any manner invalidated by any omission or neglect to give such notice or to make such entry as aforesaid.

48. Notwithstanding any such forfeiture as aforesaid, the Board may, at any time before the forfeited share has been otherwise disposed of, permit the share so forfeited to be redeemed upon the terms of payment of all calls and interest due upon and expenses incurred in respect of the share, and upon any further or other terms it may think fit.

49. Every share which shall be forfeited shall thereupon become the property of the Company, and may be either cancelled or sold, or re-allotted or otherwise disposed of either to the person who was before forfeiture the holder thereof, or entitled thereto or to any other person, upon such terms and in such manner as the Board shall think fit, and whether with or without all or any part of the amount previously paid on the share being credited as paid. The Board may, if necessary, authorise some person to transfer a forfeited share to any such other person as aforesaid.

50. A person whose shares have been forfeited shall cease to be a member in respect of the forfeited shares, but shall, notwithstanding, remain liable to pay to the Company all moneys which, at the date of forfeiture, were presently payable by him to the Company in respect of the shares, with interest thereon at such rate as the Board may determine, but this liability shall cease if

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and when the Company receive payment in full of the nominal amount of the shares.

51. A statutory declaration in writing that the declarant is a director of the Company, and that a share in the Company has been duly forfeited on a date stated in the declaration shall be conclusive evidence of the facts therein stated as against all persons claiming to be entitled to the shares. The Company may receive the consideration, if any, given for the share on any sale or disposition thereof and may execute a transfer of the share in favour of the person to whom the share is sold or disposed of and he shall thereupon be registered as the holder of the share, and shall not be bound to see to the application of the purchase money, if any, nor shall his title to the share be affected by any irregularity or invalidity in the proceedings in reference to the forfeiture, sale or disposal of the share.

52. The provisions of these regulations as to forfeiture shall apply in the case of non-payment of any sum which, by the terms of issue of a share, becomes payable at a fixed time, whether on account of the amount of the share, or by way of premium, as if the same had been payable by virtue of a call duly made and notified.

#### STOCK

53. Any share, when fully paid, may from time to time be converted into stock, and any stock may from time to time be reconverted into paid-up shares of any denomination. Such conversion or reconversion shall be effected in such manner and with such sanction as is prescribed by the Statutes and have so far as the

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Statutes require any further or other sanction to or method of conversion or reconversion may be effected by the Company in General Meeting.

54. The holders of stock may transfer the same or any part thereof in the same manner and subject to the same regulations as and subject to which the shares from which the stock arose might previously to conversion have been transferred, or as near thereto as circumstances admit, but no stock shall be transferable except in sums or multiples of such amount (not being greater than Shillings 20/-) as the Board may determine.

55. The holders of stock shall, according to the amount of the stock held by them, have the same rights, privileges and advantages as regards dividends, participation in assets on a winding up, voting at meetings, and other matters, as if they held the shares from which the stock arose, but no such privilege or advantage (except participation in dividends and in assets on a winding up) shall be conferred by any such aliquot part of stock as would not, if existing in shares, have conferred such privilege or advantage.

56. All such of the provisions of these Articles as are applicable to paid-up shares shall apply to stock, and the words "share" and "shareholder" therein shall include "stock" and "stockholder".

#### INCREASE OF CAPITAL

57. The Company may from time to time by Ordinary Resolution increase the share capital by such sum, to be divided into shares of such amount, as the resolution shall prescribe.



58. Subject and without prejudice to any rights for the time being attached to the shares of any special class, upon an increase of capital the new shares shall be issued upon such terms and conditions and with such rights and privileges annexed thereto as the resolution creating the same shall direct, and, if no direction be given, as the Board shall determine, and in particular such shares may be issued with a preferential or qualified right to dividend and in the distribution of assets of the Company and with a special or without any right of voting and may be preference shares which are, or at the option of the Company are to be liable to be redeemed.

59. The Company may, by the resolution increasing the capital, direct that the new shares or any of them shall be offered in the first instance either at par or at a premium or (subject to the provisions of section 59 of the Act) at a discount to all the holders for the time being of shares of any class or classes in proportion to the number of such shares held by them respectively or may make any other provisions as to the issue of the new shares. In default of any such direction or so far as the same shall not extend, the new shares shall be at the disposal of the Board, which may offer, allot, grant options over or otherwise dispose of them to such persons and on such terms as it shall think fit.

60. Unless otherwise stated in the terms of the issue the new shares shall be subject to the same provisions with reference to the payment of call, lien, transfer, transmission, forfeiture, and otherwise as the original share capital.

ALTERATIONS OF CAPITAL

61. The Company may by Ordinary Resolution:-

- (a) Consolidate and divide all or any of its share capital into shares of larger amount than its existing shares;
- (b) sub-divide its existing shares, or any of them, into shares of smaller amount than is fixed by the Memorandum of Association subject, nevertheless, to the provisions of section 63 (1) of the Act;
- (c) cancel any shares which, at the date of the passing of the resolution, have not been taken or agreed to be taken by any person, and diminish the amount of its capital by the amount of the shares so cancelled.

62. The Company may by Special Resolution reduce its share capital and any capital redemption reserve fund in any manner and with and subject to any incident authorised and consent required by law, and the Board may also, subject to the provisions of the Act, accept surrender of shares.

CAPITALISATION

63. The Company may by ordinary resolution upon the recommendation of the Board resolve that it is desirable to capitalise any undivided profits of the Company (including profits carried and standing to any reserve or reserves) not required for paying the fixed dividends on any shares entitled to fixed preferential dividends with or without further participation in profits or (subject as hereinafter provided) any sum standing to the credit of share premium account or capital redemption reserve fund, and

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accordingly that the Board be authorised and directed to appropriate the profits or sums resolved to be capitalised to the members in the proportion in which such profits or sums would have been divisible amongst them had the same been applied or been applicable in paying dividends and to apply such profits or sum on their behalf, either in or towards paying up the amounts, if any, for the time being unpaid on any shares or debentures held by such members respectively, or in paying up in full unissued shares or debentures of the Company of a nominal amount equal to such profits or sum, such shares or debentures to be allotted and distributed, credited as fully paid up, to and amongst such members in the proportion aforesaid, or partly in one way and partly in the other. Provided that the share premium account or capital redemption reserve fund may, for the purpose of this Article, only be applied in the paying up of unissued shares to be issued to members as fully paid.

64. Whenever such a resolution as aforesaid shall have been passed, the Board shall make all appropriations, and applications of the undivided profits or sums resolved to be capitalised thereby, and all allotments and issues of fully paid shares or debentures, if any, and generally shall do all acts and things required to give effect thereto, with full power to the Board to make such provisions by the issue of fractional certificates or by payment in cash or otherwise as they think fit for the case of shares or debentures becoming distributable in fractions, and also to authorise any person to enter on behalf of all the members entitled to the benefit of such appropriations and applications into an agreement with the Company provided for the allotment to

them respectively credited as fully paid up, of any further shares or debentures to which they may be entitled upon such capitalisation, and any agreement made under such authority shall be effective and binding on all such members.

#### BORROWING POWERS

65. The directors may exercise all the powers of the Company to borrow money and to mortgage or charge its undertaking, property and uncalled capital or any part thereof and to issue debenture, debenture stock whether outright or as security for any debt liability or obligation of the Company or of any third party.

66. Provided that the amount for the time being remaining undischarged of moneys borrowed or secured by the directors as aforesaid (apart from temporary loans obtained from the Company's bankers in the ordinary course of business) shall not at any time, without the previous sanction of the Company in general meeting, exceed the nominal amount of the shares capital of the Company for the time being issued, but nevertheless no lender or other person dealing with the Company shall be concerned to see or inquire whether this limit is observed. No debt incurred or security given in excess of such limit shall be invalid or ineffectual except in the case of express notice to the lender or the recipient of the security at the time when the debt was incurred or security given that the limit hereby imposed had been or was thereby exceeded.

#### GENERAL MEETING

67. No business shall be transacted at any general meeting unless a quorum of members is present at the time when the meeting

proceeds to business; a quorum shall only be constituted if not less than two persons, present either in person or by proxy, holding or representing the holders of no less than 50 per centum of the paid up capital of the Company are present.

#### VOTES OF MEMBERS

68. Every member present, either personally or by proxy, shall have one vote for every share held by him upon which there are no calls in arrear.

#### DIRECTORS

69. The business of the Company shall be managed by the directors who may exercise all such powers of the Company as are not, by the act or these regulations, require to be exercised by the Company in general meetings, subject, nevertheless, to any of such regulations, to the provisions of the Act and to such regulations, not being inconsistent with the aforesaid regulations or provisions, as may be prescribed by the Company by ordinary resolution but no regulation made by the Company shall invalidate any prior act of the directors which would have been valid if that regulation had not been made.

70. The directors may only purchase, deal, sell and acquire or dispose of any immoveable property (which term shall include any ship or ships) with the prior consent of the Company given by way of ordinary resolution.

71. All cheques, promissory notes, draft, bills of exchange and other negotiable instruments and all receipts for money shall be

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signed, drawn, accepted, endorsed or otherwise executed, as the case may be in such manner as the directors shall from time to time by resolution determine.

72. If at any time more than 50 per cent of the issued paid up ordinary share capital of the Company shall be held by a single shareholder, the power of appointing new directors or a new director shall be vested in such shareholder and such power of appointment shall be validly exercised by such shareholder giving notice in writing to the Company stating the name of the director to be appointed and such notice may be signed by the shareholder or the shareholder's agent or attorney, without prejudice to the foregoing power, the power of appointing a new director or directors may be

73. Each director shall have the power to appoint either another director or any person approved for that purpose by a resolution of the directors, to act as alternate director in his place during his absence and at his discretion to remove such alternate director and on such appointment being made the alternate director shall, except as regards remuneration and the power to appoint an alternate, be subject in all respects to the terms and conditions existing with reference to the other directors of the Company and each alternate director, while so acting, shall exercise and discharge all the functions, powers and duties of the director whom he represents. Any director acting as alternate shall have an additional vote for each director for whom he acts as alternate. An alternate director shall ipso facto cease to be an alternate director if his appointor ceases for any reason to be a director. All appointments and

removals of alternate as director shall be effected by instrument in writing delivered at the registered office of the Company and signed by the appointor.

74. (a) The number of directors shall not be less than two and not more than five, unless the company by ordinary resolution shall otherwise decide.

(b) The quorum of directors shall be two but such quorum if a managing director shall be appointed must include such managing director unless such managing director shall agree in writing to any directors meeting being held in his absence.

(c) A resolution signed by all directors (each director having power to sign through any alternate appointed pursuant to the provisions of Article 21) shall be as valid and effectual as if it had been passed at a duly constituted meeting.

(d) A director shall not require any share qualification.

75. The directors shall be paid out of the funds of the Company by way of remuneration for their services such sum as the Company in general meeting may from time to time determine and such remuneration shall be divided among them in such proportion and manner as the directors may determine and in default of such determination within the year equally. The directors shall also be paid all reasonable travelling and hotel expenses incurred by them in connection with attending and returning from Board meetings.

76. If any director, being willing, shall be called upon to perform extra services or to make special exertions in going or residing abroad or otherwise for any of the purposes of the

Company, the Company may remunerate such director as may be either in addition to or in substitution for his share in the remuneration above approved and may also refund to such directors all reasonable expenses incurred by him whilst on the Company's business.

#### DISQUALIFICATION OF DIRECTORS

77. The office of a director shall be vacated as follows:-
- (a) If he becomes a bankrupt or insolvent or compound with his creditor;
  - (b) If he becomes of unsound mind or be found a lunatic;
  - (c) If he be convicted of an indictable offence;
  - (d) If he be removed from office by the Company by ordinary resolution;
  - (e) If he gives the secretary notice in writing that he resigns his office.

But any act done in good faith by a director whose office is vacated as aforesaid shall be valid unless prior to the doing of such act written notice shall have been served upon the Company or an entry shall have been made in the director's minute book stating such director has ceased to be a director of the Company.

78. A director may hold any office of profit under the Company other than that of audit in conjunction with the office of directors and may enter into contracts or arrangements or have dealings with the Company and shall not be disqualified from office thereby, nor shall he be liable to account to the Company for any profit arising out of any such contract, arrangement or dealing to which he is a party or in which he is interested by reason of his being at the same time a director of the Company, provided that

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such director discloses to the meeting of the directors at which such contract, arrangement or dealing is first taken into consideration the nature of his interest therein, or if such interest is subsequently acquired, provided that he discloses the fact that he has acquired such interest at the next meeting held after such interest was acquired. But except in respect of an agreement or agreements to give any indemnity or security to any director who has undertaken or is about to undertake any liability on behalf of the Company or of a resolution to allot any shares or debentures to a director, nor director shall vote as a director in regard to any contract, arrangement or dealing in which he is interested or upon any matter arising thereout and if he shall so vote his shall not be counted nor shall he be reckoned in estimating the quorum when any such contract arrangement or dealing is under consideration. A general notice given to the directors by a director to the effect that he is a member of a specified company or firm, shall for the purpose of this Article, be deemed to be a sufficient disclosure of interest in relation to any contract, arrangement or dealing so entered into or made.

#### MANAGING DIRECTOR

79. The directors may from time to time appoint one or more of their body to the office of managing director for such period and on such terms as they think fit and may at any time revoke such appointment; the appointment of managing director shall be automatically determined if the person appointed to such office shall cease from any cause to be a director.

80. A managing director shall receive such remuneration (whether

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by way of salary, commission or participation in profits or partly in one way or partly in another) as the directors may determine.

81. The directors may entrust to and confer upon a managing director any of the powers exercisable by them upon such terms and conditions and with such restrictions as they think fit and either collaterally with or to the exclusion of their own powers and may from time to time revoke, withdraw, alter or vary all or any of such powers.

82. The directors shall provide for the safe custody of the seal, which shall only be used by authority of the directors in that behalf and every instrument to which the seal shall be affixed shall be signed by two directors and the secretary or by a director and some two other persons appointed by the directors for the purpose.

#### NOTICES

83. When a notice is sent by post it shall be deemed to have been served at the expiration of seven days after it was posted and clause 131 of Table "A" shall be modified accordingly.

#### WINDING UP

84. The Company shall be wound up the assets remaining after payment of the debts and liabilities of the Company and the costs of the liquidation will be applied, first, in repaying to the members the amounts paid or credited as paid up on the shares held by them respectively and the balance (if any) shall be distributed among the members in proportion to the number of shares held by

them respectively. Provided always that the provisions hereof shall be subject to the rights of the holders of shares (if any) issued upon special conditions.

85. In a winding up any part of the assets of the Company including any shares in or securities of other companies, may be closed and the Company dissolved but so that no members shall be compelled to account any shares whereon there is any liability.

NAMES, POSTAL ADDRESSES AND OCCUPATIONS OF SUBSCRIBERS	SIGNATURES OF SUBSCRIBERS
1.	
2.	

DATED the ..... day of ..... 1987

WITNESS of the above signatures:-

MESSRS MULIRA & COMPANY  
ADVOCATES  
123 BAUMANN HOUSE  
7 OBOTE AVENUE  
P. O. BOX 182  
KAMPALA.

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## APPENDIX E

### The Seed and Other Planting Materials Act

#### 1. General

The draft which the ICD mission examined on "The Seed and Other Planting Materials Act" for the Republic of Uganda stated the following objectives: "the control and regulation" of plant breeding, variety release, multiplication, conditioning, marketing, imports, exports, and quality assurance of seeds and other planting materials on matters incidental to or connected with the foregoing.

The above statement manifests a clear intention and purpose of control and regulation on seeds and activities centered on seeds. It is typical of legislation which arose in periods where there was no private sector and there appeared no need to promote the presence of one. This type of legislation is focused on controls. It carries no promotional provisions and does not treat the problem of how to stimulate production of more and better seeds, and organize a system to perform this feat. Regulations are placed ahead of promotion, and seeds start to be regulated and controlled or "policed" before there are even enough seeds to warrant the effort.

Modern, basically promotional, legislation requires seeds to "happen" before there is a serious attempt at regulation. This type of legislation prominently encourages the participation of a private seed industry. It divides the body of articles into groups dealing normally with the following parts:

- A. Incentives and promotional facilities to enable the presence and growth of a private sector dedicated to seed activities.
- B. The establishment and administration of entities in the public and private sectors which form the National Seed System, organized according to the needs and peculiarities of the country.
- C. Seed research, testing, and variety registration.
- D. Seed quality control.
- E. Seed certification.
- F. Seed marketing regulations.
- G. Import and export of seeds.

H. Phytosanitary regulations, and

I. Variety Protection.

The Seed Act should have the status of a Law, a hierarchical category in governmental jurisprudence, second in rank only to the Constitution of the country. Its articles should explicitly avoid conflicts of interpretation by a statement in the Law that all articles in any other Law which oppose the Seed Law are automatically abolished or are without effect.

It should be simple, concise, and should be preceded by a preamble stating that there is a political philosophy behind its articles, and stating explicitly what it is. For example, the preamble to the modern Seed Law of Peru (1978), (see Appendix F) cites as its political philosophy that the Law is intended to pave the way for the activities of research, production, processing, and marketing and distribution of seeds, so that sufficient quantities of high quality seed of high yielding varieties are present at opportune times and at fair prices. It signals furthermore that the government guarantees the right of any resident in the country to enter those activities within the realm of the Law. The promotional nature of the Law is explicit from the very beginning of the text, and pervades all its contents. The controls are incidental only to the main objective of fostering the supply of high quality seed.

An alternative to the kind of Seed Law outlined above is one that sets up an impressive body of controls and relatively few incentives. It is likely, as has frequently happened, to end up with no seeds to control and lots of controllers to support.

Seed Laws should be simple. Simplicity should have no compromise with completeness. The proposed Seed Act for Uganda is both incomplete in terms of the above concepts, and legally and technically incoherent. It is integrated as a well structured manual for a course on seeds, but it does not have the structure that a modern Law or Act regarding seeds should have.

Guidelines have been developed at CIAT Seed Unit for accurate and perfectly structured legislation based on actual experience, and leading to a promotional type of law. Such a model involves the following components:

- (a) A short, complete text for the Seed Law with sufficient articles and text to define clearly its objectives and mandates.
- (b) A set of Regulations to the Law which are produced after the Law is promulgated or enacted.

Seed Laws or Acts are approved in Parliaments, after study. The Regulations are incidental to the Law; they clarify the Law as to operational details, and are produced by simple Ministerial decree. While the Law is planned to be a permanent or semi-permanent juridical structure, the regulations articulate the body of the Law and are designed to be easily changeable. The articles may evolve with the changing circumstances, without changing the basic contents and nature of the Law. Furthermore, at Divisional or Departmental levels, a Manual of Procedures or Methods defines the actions to be undertaken for a variety of circumstances. They can in no way, however, go beyond the published Regulations or the Articles of the Law.

The proposed Uganda Seed Act draft contains what should normally constitute lower hierarchical level regulations, procedures, and definitions. These do not belong in the body of the Law, and should be reclassified, removed from the Law, and placed in their correct context.

## 2. Specific Articles

The proposed Seed Act is not adapted to the presence and needs of a private seed sector. If such a seed sector is to develop, all articles which oppose this concept should be deleted. The Seed Act should reinforce the concept of coexistence and cooperation between the private seed sector as the seller of goods and related services, and the public sector which is responsible for overall planning and policy formulation, promotion, and technical and control responsibilities, as well as research, extension and foundation seed production.

Concepts in need of introduction into the Seed Law are:

- A. A National Seed Administration with four Divisions:
  - o Administration and Promotion
  - o Seed Quality Control and Seed Laboratories
  - o Seed Certification Service
  - o Foundation Seed Production
- B. National Seed Council

- C. Revision of the concept of seed classes
- D. Revision of testing regulations, variety registration and variety release
- E. Non-compulsory certification
- F. Permanent registration in all categories of research, production, marketing and general seed licenses
- G. Elimination of "red tape" and unnecessary bureaucratic procedures
- H. Update of certification procedures and information on which seed classes and species can currently be certified
- I. Private research establishment and support
- J. Varietal registration and protection
- K. Seed quality control and consumer protection as a continuing process in the marketplace
- L. Representation of seed producers and distributors.

APPENDIX F  
Seed Law of Peru



**GENERAL LAW FOR SEEDS**

**DECREE LAW N° 23056**

**THE PRESIDENT OF THE REPUBLIC**

**WHEREAS**

**The Revolutionary Government has promulgated the following Decree Law**

**THE REVOLUTIONARY GOVERNMENT:**

**CONSIDERING**

That a purpose of the Revolutionary Government of the Armed Forces is to increase the agricultural and forestry production, in view of the significant incidence it has on the national economy;

That seed is one of the essential inputs of agricultural activities, whose quality, adequate and opportune supply are fundamental to increase agricultural productivity and production;

That it is convenient that the Non Public Sector be engaged in a more active participation in research activities in order to improve plants; as well as stimulate their intervention in the production and marketing of seeds; in order that the latter may be channeled progressively through this Sector;

That it is necessary for a legal instrument to be drawn up to regulate and stimulate the activities of research, production, processing, marketing and control of seed, in order that agricultural producers may count with an opportune and adequate supply of improved seed;

Under the faculties with which it has been endowed; and with the approving vote of the Council of Ministers, has promulgated the following Decree Law;

/.

## GENERAL LAW FOR SEEDS

### TITLE I

#### GENERAL REGULATIONS

- Article 1°** Declare that the production and supply of seed within the country is of public necessity and national interest;
- Article 2°** That the purpose of the present Law is to promote, regulate and con trol activities dedicated to the research, production, processing and marketing of seed within the national territory under the norms esta blished by this present Law and its Regulations.
- Article 3°** The State guarantees the right of every natural or juridical person to participate in activities of research, production, processing and mar- keting of seed under the norms established by this Law and its Regula- tions.
- Article 4°** For the effects of this Law, we consider:
- a) "SEED". Every type of botanical structure destined to the sexual or asexual propagation of a specie.
  - b) "CULTIVAR". A group of cultivated plants which are distinguis- hable one from another by determined characteristics (Morpholo- gical, Physiological, Cytological, Chemical or others) that are of importance for agricultural purposes, and which, when reproduced (sexually or asexually) or reconstituted, retain their dis tinctive characteristics.
- Article 5°** The following Categories of Seed are hereby established:
- a) "GENETIC SEED". Are the Seeds that result from a genetic improve- ment process capable of reproducing the identity of a cultivar, ma

naged or conducted by its improver or other, if this is not possible, and from which basic or foundation seed are produced.

- b) "BASIC OR FOUNDATION SEED". Is the seed obtained through the use of genetic seed, produced under the supervision of its improver or other, if this is not possible, and subjected to the process of certification, which complies with the minimum established requirements and whose destination is the production of registered and/or certified seed.
- c) "REGISTERED SEED". Is the seed which obtained from the basic or foundation seed subjected to the process of certification, which complies with the minimum established requirements, and whose purpose is the production of certified seed.
- d) "CERTIFIED SEED". Is the seed which comes from the basic seed, the foundation seed or registered seed, subjected to the process of certification and which complies with the minimum established requirements.
- e) "AUTHORIZED SEED". Is the seed which possesses sufficient identity and purity of variety and which complies with the requirements established for certified seed, with the exception of precedence.
- f) "COMMON SEED". Is that seed with the minimum established requirements in quality and health, and which is not involved in the previous categories.

**Article 6°** The regulations which for each specie or group of species are approved, shall establish in each case, which are the defined categories to be admitted. Like wise, for each category of seed admitted, definitions shall be complemented in accordance with the different cultivar repro

duction systems.

**Article 7°** The scope for the application of the present Law comprises seeds of agricultural, forestry, ornamental species and in general, all seeds of economic usage in agricultural and related industries.

**Article 8°** The Ministry of Agriculture at the proposal of the National Seed Commission Shall dictate the general and specific Regulations which are to rule the production, processing and marketing of seeds.

## TITLE II

### REGISTRY FOR CULTIVARS

**Article 9°** The Ministry of Agriculture and Food shall establish the Registry for Cultivars and the Registry of Protected Phylogenetic Creations.

**Article 10°** Every cultivar belonging to the species in process of certification, and whose seed requires marketing within the country or abroad, shall be registered in the Ministry of Agriculture and Food.

**Article 11°** In the Registry of Cultivars there shall be included those cultivars which are homogeneous and stable, in accordance with their systems of reproduction and possess an agronomic value or sufficient use, with the exception of cases where Specific Regulations indicate that further proof is not required.

**Article 12°** The Ministry of Agriculture and Food shall publish lists of cultivars included in the mentioned Registry in the previous article, as well as lists of Cultivars recommended in those species where it is considered convenient.

**Article 13°** Seeds of cultivars included in the lists referred to in the preceding article may only be produced or imported for commercial purposes.

**Article 14°** The Registry of Protected Phylogenetic Creations, shall include all those which may be object of a "Deed of Vegetable Achievement", whereby its owner will be conceded a transferable and hereditary right, including the right to produce, introduce, sell or offer in sale any element of reproduction of said cultivar. The Ministry of Agriculture and Food shall issue a Special Regulation, for the purpose of regulating and establishing the rights of the authors or creators.

### TITLE III

#### CERTIFICATION AND CONTROL

**Article 15°** Certification of Seed, for the effect of the present Law, shall signify the technical process of supervision and verification of the genealogy, production, processing and final analysis of the quality of the seeds, performed directly by the Ministry of Agriculture and Food or by delegation of same and destined to maintain the purity, genetic identity, quality and health of the seed, in accordance with the requirements established in the Specific Regulations.

**Article 16°** The certification of seed, guarantees that the different operations of production and processing have been fulfilled in accordance with the Specific Regulations issued. For such purpose those seeds that have been obtained in accordance with the rules fixed by the Ministry of Agriculture and Food and which comply with the minimum requirements for quality, shall be identified with markings on their containers and classified within the categories defined in the present Law.

**Article 17°** The following categories are subject to Certification, Basic Seed or Foundation Seed, Registered Seed and Authorized Seed.

**Article 18°** Control shall mean all actions performed by the Ministry of Agriculture

and Food that tend to detect and/or sanction infractions committed in connection with clauses of the present Law and its Regulations . These actions may not be delegated.

#### TITLE IV

#### RESEARCH AND PRODUCTION

Article 19° For the effects of the present Law insofar as research and production of Seed is concerned:

- a) "GERMPLASM BANK". Is a useable reserve of genetic material maintained by means of a collection of live plants of a same specie and/or different species, of a same botanic genus or related genus, or of reproductive elements of said plants, in their natural state or subjected to special conditions of preservation.
- b) "PHYTOGENETIC CREATION". All groups of individuals included in the definition of cultivar, although not necessarily possessing important characteristics for agricultural purposes, obtained through discovery as a result of a genetic process and/or as a consequence of the application of scientific knowledge about the improvement of vegetables.
- c) "PHYTO-IMPROVER OR OBTAINER" a Natural or Juridical person who obtains a phytogenetic creation.
- d) "SEED PRODUCER". Every natural or juridical person duly registered, who is directly or responsibly engaged in the multiplication, processing and/or management of seed.

Article 20° The National Agricultural Research Institute (INIA), shall govern the establishment and operation of Germplasm Banks.

Article 21° Public Organizations who are the owners of a "Decree of Vegetable Achievement", may grant working licences to any person who so requests it and presents the technical and legal guarantys in accordance with what the specific regulations determine on the rights of the Obtainer. These licences do not possess the character of exclusiveness.

Article 22° Every producer of seed, in order to be recognized as such must be inscribed in a registry which for such effects will be carried by the Ministry of Agriculture and Food. The Regulations of the present Law, shall set forth the minimum conditions required to be a producer of seed.

## TITLE V

### PROCESSING AND MARKETING

Article 23° The processing of seed, is the series of chemical, physical and/or mechanical processes, destined to improve the quality, health and preservation conditions of seed.

By marketing, it shall be understood to be that activity which engages in the purchase, storing, distribution and sale of seed.

Article 24° A seed merchant is every natural or juridical person who does not produce seed but who is engaged in the marketing of same. For this purpose he must be duly inscribed in the Registry of Seed Merchants which for such purpose will be established by the Ministry of Agriculture and Food. Anyone who fulfills the minimum requirements established in the regulations to be a producer of seed is likewise authorized to market them.

- Article 25° The marketing of seed shall be subject to the minimum requirements established in the Specific Regulation for the different categories - allowed.
- Article 26° Every seed that is marketed must carry a tag or inscription on their containers, in which their characteristics shall be clearly indicated, providing the information which will be established in the corresponding - Specific Regulations.
- Article 27° Grains, tubers and other vegetable products produced or imported for direct consumption or industrialized, may not be marketed as seed.
- Article 28° The seeds that are imported must correspond to the seeds set down in the categories in Article 5° and possess, at least, the same characteristics as required by said article, and for which the Ministry of Agriculture and Food shall establish their equivalency.
- Article 29° The production of cultivars that are marketed, must carry the corresponding denomination of its registered cultivar.
- Article 30° At the request of the Ministry of Agriculture and Food, the National Enterprise for the Marketing of Inputs (ENCI) may intervene in the marketing of seeds, for which purpose it will be provided with the financial resources required.
- Article 31° Importations and exportations shall be carried out according to the supply requirements the country may need. Seeds may be exported only after the domestic demand requirements have been covered and they shall be imported when they are not produced in the country or when the needs require such imports, after the Ministry of Agriculture and Food has issued its opinion in both cases.



## TITLE VI

### ADMINISTRATIVE ORGANIZATIONS

- Article 32°** The Ministry of Agriculture and Food, shall be in charge of the following functions:
- a) Certification of seeds which may be performed directly or by delegation or agreement with other organizations of the Public Sector.
  - b) Perform the actions of control prescribed by the present Law and its Regulations.
  - c) Carry out quality control analysis on seeds, which may be performed directly or by delegation or agreement with other organizations of the Public Sector.
  - d) Register the cultivars and the protected Phyto-genetic Creations.
  - e) Carry the Registry established by the present Law and its Regulations.
  - f) Others that may become necessary for the better compliance of the objectives established by the present Law.
- Article 33°** The National Seed Commission is hereby established, which will permanently be in charge of studying, analysing and proposing solutions in regard to the situation of research, production, marketing and use of seeds in the country.
- Article 34°** The national Seed Commission shall be conformed by the following members:
- Three representatives of the Ministry of Agriculture and Food, one of whom shall preside.
  - One representative of the National Agricultural Research Institute.

- One Representative of the Peruvian University.
- One Representative of the Agricultural Bank of Perú; and
- One Representative of the seed producers, duly organized.

The conformation of this Commission may be subject to changes.

**Article 35°** The National Seed Commission has the following functions:

- a) Propose the policy on research, production and marketing of seeds in the country.
- b) Propose the necessary measures to be taken for the better management of activities related to seeds in the country, and for the compliance with this Law and its Regulations.
- c) Propose the projects for regulations that it deems necessary.
- d) Propose to the Ministry of Agriculture and Food, the applicable fees for the Certification of Seed and the Registry of Cultivars.
- e) Issue its opinion on all aspect related to seed, submitted to its consideration.
- f) Any other function entrusted to it.

## TITLE VII

### DEVELOPEMENT

**Article 36°** The Ministry of Agriculture and Food shall stimulate research, production and the use of certified seed of cultivars of superior quality.

**Article 37°** The loans for the maintenance and for investment intended for the production, processing and marketing of seeds, granted by the Agricultural

Bank of Perú, shall enjoy all the benefits granted to agricultural producers.

**Article 38°** The Foreign Marketing of Seed shall be performed in accordance with preferential Customs Provisions which are ruled by their corresponding pertinent agencies.

**Article 39°** The application for importation or exportation licences for seed, for purposes of research, shall enjoy a special treatment, within a framework of expediency regulations, and of facilities which in this case will be fixed by the official agencies, they shall likewise be declared of non-commercial value.

## TITLE VIII

### SPECIAL CLAUSES

**Article 40°** Contraventions to the General Law for Seeds and its Regulations shall be sanctioned in the form and manner specified by the former.

**Article 41°** The National Bank of Forestry Seeds referred to in Article 11° of Supreme Decree N° 159-77-AG of March 31st of 1977 shall likewise be comprised within the definition contained in clause d) of Article 1°.

**Article 42°** Article 3° of Supreme Decree N° 0053-78-EF is hereby extended to incorporate Decree Law 22273, with the following clause:

- 1) "Finance research, production, processing and marketing programs of seeds".

## TITLE IX

### TRANSITORY CLAUSES

**Firsto** During the period until the Specific Regulations for each specie or groups

of species do not enter into force in accordance with the present Law which will permit the regulation of production, processing and marketing of seeds, as well as the Certification, Control and Registry of Cultivars, the Official Regulations on the Commerce of Seeds approved by Supreme Resolution N° 263 of August 20th, 1940 shall continue to be applied.

**Second** The National Commission for Seeds must be constituted within fifteen days after the present Law enters into force.

**Third** The Ministry of Agriculture and Food within the term of forty five days beginning from the entering into force of the present Law shall formulate the corresponding regulations which will be approved by Supreme Decree.

#### FINAL CLAUSE

All dispositions opposing the present Decree Law are hereby notified or left in abeyance.

Given in the House of Government, in Lima, twenty one days of the month of May, Nineteen Hundred and Eighty.

Division General Francisco Morales Bermúdez, President of the Republic.

Division General Pedro Richter Prada, President of the Council of Ministers and Minister War.

Lieutenant General Luis Arias Graziani, Minister of Aeronautics

Vice Admiral Juan Egusquiza Babilonia, Minister of the Navy

Ambassador R. Arturo García y García, Minister of Foreign Affairs

Doctor Javier Silva Cuete, Minister of Economy and Finance.

Division General José Guabloche Rodríguez, Minister of Education

Vice-Admiral Jorge Du Bois Gervasi Minister of Industry, Commerce, Tourism and Integration

Division General René Balarezo Vallebuona, Minister of Energy and Mines.  
Division General José Soriano Morgan, Minister of Transport and Communications.  
Lieutenant General Eduardo Rivasplata Hurtado, Minister of Health.  
Lieutenant General Javier Elías Vargas, Minister of Labor  
Brigadier General César Rosas Creste, Minister of Housing and Construction  
Rear Admiral Jorge Villalobos Urquiaga, Minister of Fisheries.  
Brigadier General César Iglesias Barrón, Minister of the Interior  
Brigadier General Carlos Gamarra Pérez Egoza, Minister of Agriculture.