



# **An Action Plan for Developing Agricultural Input Markets in Uganda**

**An  
International  
Center for  
Soil Fertility  
and  
Agricultural  
Development**





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**Prepared by**

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and  
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## Preface

The Ugandan economy is a predominantly agricultural economy, but the low land and labor productivity in the agricultural sector has resulted in a high incidence of poverty in rural areas. To reduce poverty and hunger, agricultural productivity must be increased. This cannot be achieved without appropriate use of modern technologies based on improved seed, mineral fertilizer, and crop protection products (CPPs). Adequate and timely supply of these inputs is needed at the farm level. However, input supply systems in Uganda remain underdeveloped, and farmers have difficulty in accessing inputs. This study focuses on the functioning of the input markets, constraints affecting their performance, and measures needed to make them more effective and efficient.

This assessment and associated action plan is one of several country-specific efforts undertaken by IFDC to promote the development of agricultural input markets (AIMs) in Africa. During 1998/99 at the request of the USAID/Africa Bureau and in collaboration with other organizations, IFDC prepared a strategic framework for promoting sustainable input supply systems in Africa. The framework was validated at a regional workshop in Addis Ababa in 1999. Because the framework was generic in nature, the workshop delegates recommended that a few country-specific studies be undertaken to test the framework at national levels. Subsequently, IFDC and various collaborators have prepared action plans for developing AIMs for Malawi, Nigeria, and Ghana. Several donors including USAID, Directoraat Generaal voor Internationale Samenwerking (DGIS), Department for International Development (DFID), European Union (EU), The World Bank, and SG 2000 have contributed to the preparation of these action plans.

This assessment and action plan development was undertaken by IFDC in collaboration with SG 2000 and the IDEA Project. It was sponsored by MAAIF and funded by the USAID/Africa Bureau. The assessment team included the following members:

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The assessment team visited Uganda during March 2002 and consulted with various stakeholders including policymakers, donors, National Agricultural Research Organizations (NAROs), nongovernmental organizations (NGOs), bankers, farmers, and input dealers. To encourage focused discussions of various issues and to ensure wide coverage, the team was divided into two groups (fertilizer group and seed and CPP group) and traveled extensively in the country. The first group traveled to Mbale, Kapchorwa, Iganga, Bugiri, Tororo, and Mukono and the second group visited Mpigi, Masaka, Hoima, Masindi, Lira, and Luwero.

The preliminary impressions of the team were shared at debriefings at MAAIF and the Donors Group. Comments and suggestions from these meetings were reflected in the draft *Action Plan*, which was validated at a stakeholders' workshop in Uganda in October 2002. The IDEA Project provided partial funding support for the workshop. Comments and suggestions received at the workshop are reflected in the report. The *Action Plan* recommends a holistic approach and private-public partnerships for strengthening the functioning of input markets in Uganda.<sup>1</sup>

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1. The views and interpretations expressed in this document are those of the Study Team and should not be attributed to the funding or sponsoring agencies.



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## Abbreviations and Acronyms

ACB	Agricultural Chemical Board
ACTC	Agricultural Chemical Technical Committee
ADC	Agribusiness Development Centre, IDEA Project
AIF	Agricultural Input Import Fund
AIM	Agricultural Input Market
AS	ammonium sulfate
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
BOU	Bank of Uganda
Bt	Bacillus thuringiensis
CAN	calcium ammonium nitrate
CBO	community-based organization
COREC	Coffee Research Centre
CPP	crop protection product
DAP	diammonium phosphate
DFID	Department for International Development
DGIS	Directoraat Generaal voor Internationale Samenwerking
EAC	East African Community
EASCo	East African Seed Company
ECAPAPA	Eastern and Central Africa Programme for Agricultural Policy Analysis
EEC	European Economic Commission
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FICA	Farm Inputs Care Centre
GDP	gross domestic product
GOU	Government of Uganda
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Assistance)
ha	hectare(s)
HFS	Harvest Farm Seeds
IDEA	Investment in Developing Export Agriculture (USAID-funded project)
IFDC	An International Center for Soil Fertility and Agricultural Development
IITA	International Institute for Tropical Agriculture
IMF	International Monetary Fund
INIBAP	International Network for Improvement of Banana and Plantain
IPM	integrated pest management
KARI	Kawanda Agricultural Research Institute
kg	kilogram(s)
km	kilometer(s)
KR-II	Kennedy Round II
KSGGA	Kasese Seed and Grain Growers' Association
MAAIF	Ministry of Agriculture, Animal Industry, and Fisheries
MPED	Ministry of Finance, Planning and Economic Development
MIS	market information system
MRC	Market Research Council

MSGGA	Masindi Seed and Grain Growers' Association
mt	metric ton(s)
MTCS	Medium-Term Competitiveness Strategy
MWHC	Ministry of Works, Housing, and Communication
NAADS	National Agricultural Advisory Services Programme
NAARI	Namulonge Agricultural and Animal Production Research Institute
NARO	National Agricultural Research Organization
NASECO	Nalweyo Seed Company
NCST	National Council of Science and Technology
NDA	National Drug Authority
NEMA	National Environmental Management Agency
NGO	nongovernmental organization
NPK	nitrogen, phosphate, potassium compound fertilizer
NSB	National Seed Board
NSCS	National Seed Certification Service
OPVs	open-pollinated varieties
PAF	Poverty Action Fund
PEAP	Poverty Eradication Action Plan
PMA	Plan for Modernization of Agriculture
RAMs	rural agri-markets
RF	regulatory frameworks
SAARI	Serere Agriculture and Animal Production Research Institute
SG 2000	Sasakawa-Global 2000
SIBDF	Small Input Business Development Fund
SSP	single superphosphate
TSP	triple superphosphate
UBS	Uganda Bureau of Standards
UCPA	Uganda Chemicals and Pesticides Association
UGT	Uganda Grain Traders
UNBS	Uganda National Bureau of Standards
UNCST	Uganda National Council of Science and Technology
UNSPPA	Uganda National Seed Potato Producers' Association
UOSPA	Uganda Oilseed Producers and Processors' Association
UPPC	Uganda Printing and Publishing Company
URA	Uganda Revenue Authority
U.S.A.	United States of America
USh	Uganda shilling
USAID	United States Agency for International Development
USL	Uganda Seeds, Ltd.
USP	Uganda Seed Project
USTA	Uganda Seed Trade Association
VAT	value-added tax
VCU	value for cultivation and use
VRC	Variety Release Committee
WTO	World Trade Organization

# An Action Plan for Developing Agricultural Input Markets in Uganda

## Executive Summary

### *I. Introduction*

Uganda is a predominantly agricultural economy. The agricultural sector contributes 43% to the gross domestic product (GDP), provides employment to over 80% of the workforce in rural areas, and is a main source of foreign exchange earnings (85% of export earnings). Yet, land and labor productivity is low and the incidence of poverty, especially in rural areas, is high. Nearly one-half of the population lives below the poverty level and faces food insecurity. The challenges of food insecurity and poverty are compounded by the health crisis and environmental degradation that Uganda is facing. In confronting these socioeconomic challenges, the agricultural sector has a *lead role* to play. However, with its current low productivity status, the agricultural sector can do little to improve the socioeconomic situation. The agricultural sector itself requires a significant transformation such that crop yields and incomes are greatly increased. Such transformation cannot be achieved without the sound application of modern technologies embodied in improved seeds, mineral fertilizers, CPPs, water management, and better agronomic practices.

To transform its agriculture, the Government of Uganda (GOU) has introduced several programs. Notable among them are macroeconomic reforms of the mid-1980s, export diversification of the 1990s, and the Poverty Eradication Action Plan (PEAP) and the PMA of 2000. The PMA has become the blueprint to guide GOU's efforts toward agricultural development and transformation. Under the PMA, the GOU has identified seven pillars for focused efforts. The pillars are national agricultural advisory services (NAADS), research and technology development, agricultural education, rural financial services, marketing and agro-processing, physical infrastructure, and natural resource management and utilization.

To strengthen the demand-driven extension activities, the GOU has already launched NAADS on a pilot basis in six districts—Mukono, Kibale, Arua, Kabale, Tororo, and Soroti. Under this pilot effort, extension services are decentralized, and local governments are allocated funds to provide farmer-demanded extension support.

All these governmental efforts are important and praiseworthy. However, as the input supply systems have been privatized and liberalized, the input sub-sectors seem to have suffered from a *benign neglect* on the part of both policymakers and donors. As a result, farmers in rural areas do not have easy access to inputs (improved seeds, fertilizers, and CPPs), and even where these inputs are available, their prices are very high. This situation forces farmers to rely on low-productivity subsistence farming methods and thereby live in a vicious cycle of poverty and low productivity.

### **Goal, Scope, and Objectives of the Action Plan**

Well-functioning agricultural input markets (AIMs) are the backbone of agricultural transformation in Africa. Only such markets can ensure inputs of good quality, easy accessibility, and lower prices to farmers. Hence, the goal of the action plan is to suggest appropriate measures to create well-functioning AIMs in

Uganda. This was achieved by conducting an assessment of input markets in Uganda and then preparing an action plan for their orderly development. The assessment focused on the following themes:

1. Assessment of the structure, functioning, and performance of AIMs—fertilizer, seed, and CPP markets.
2. Identification of constraints affecting the performance of AIMs.
3. Evaluation of the potential of the private sector in supplying inputs.
4. Development of an action plan incorporating measures needed to make AIMs more effective and efficient.
5. Institutional arrangements for implementing the action plan.

The action plan mainly focuses on issues related to the supply-side of the market equation for two reasons: First, the input supply system changed from a public sector monopoly to a private sector-based competitive market, and therefore there is a need to assess the potential and efficacy of the private sector in supplying inputs. Second, while input demand has been studied extensively, few studies have paid attention to the issues related to input supply and transaction costs, whereas a reduction in transaction costs is essential to lower input prices for small farmers. The action plan also focuses on technology transfer, output market development, and regional integration of markets that affect input demand directly and significantly. Because of its emphasis on improving the supply of modern inputs for agricultural transformation, the action plan complements and strengthens Uganda's plans for agricultural development in general and its priorities identified in the PMA in particular.

## *II. An Assessment of Agricultural Inputs Markets in Uganda*

### **The Policy Environment**

Due to successful implementation of economic reforms, there are few policy distortions in the input markets. Specifically, no parastatals are involved in distributing inputs, no control or regulation of prices is enforced, and no subsidies are given on inputs. However, there are concerns that should be addressed so that no impediments are created for the private sector participation. These include recent intention of the government for free distribution of seed, seedlings, and planting materials for selected crops; distribution of inputs through NGOs that do not recover full costs of inputs; and free or subsidized supply of breeder seed from NARO to the Uganda Seed Project (USP). Likewise, poor enforcement of quality control regulations poses a serious threat to an orderly development of well-functioning input markets.

While there are no pricing distortions in the market, the macroeconomic environment remains rather market unfriendly. Continuous depreciation of the Ugandan shilling (USh), high interest rates, and limited access to finance are serious constraints that discourage private sector involvement in agricultural marketing. Interest rates vary from 20% to 30% in the urban areas and from 30% to 48% in the rural areas. The unwillingness of commercial banks to lend for agriculture and agribusiness operations makes it difficult for emerging entrepreneurs to start new business ventures.

In addition to the aforementioned constraints, there are numerous market development-related challenges affecting private sector involvement in agri-input marketing. These include the lack of market information, inadequate access to finance, limited marketing and business skills (human capital), and poor enforcement of regulatory frameworks. Confronting these challenges will require significant

resources and commitments. The nature and intensity of these challenges for each input market are briefly summarized in Matrix A.

**Matrix A. Market Development-Related Constraints in Uganda**

Market	Constraints				
	Policy	Human Capital	Finance	MIS <sup>a</sup>	RF <sup>b</sup>
Fertilizer	Mild	Severe	Severe	Severe	Mild
Seed	Mild	Severe	Severe	Severe	Mild
CPP	None	Severe	Mild	Severe	Severe

a. MIS = Market Information System.

b. RF = Regulatory Frameworks.

Although the GOU is not involved in direct distribution of inputs, some donors and NGOs promote the free distribution of inputs for relief or safety net purposes. It is recommended that such well-intentioned efforts should be implemented in a market-friendly way. Farmers or other intended beneficiaries should be empowered with purchasing power in the form of vouchers to buy the required quantity of inputs from the marketplace.

Although there are no direct tariffs or taxes on inputs imported or used, there is a concern that taxes on packaging materials and fuel add to the cost of seed and fertilizer to the farmer. Since these items are also used in other sectors of the economy and therefore carry a uniform value-added tax (VAT) of 17%, exempting these items for agriculture may open avenues for misuse. For this reason, the International Monetary Fund (IMF) and the Ministry of Finance are reluctant to make an exception. Therefore, it was decided by the workshop delegates that a study should be commissioned to explore the possibility of exempting packaging material from VAT.

### Perceptions About Fertilizer Use

The action plan's main focus was on the issues related to input supply. However, some issues related to demand also warrant discussion. One critical issue is that of perception. Many small farmers feel or have been made to believe that mineral fertilizers are not needed because the Ugandan soils are rich, or simply fertilizers are harmful to the soil. Such misperceptions should be alleviated by proper education and dissemination of information. Here the MAAIF has a significant responsibility to educate farmers about proper use of both organic and inorganic inputs.

### The Fertilizer Market

Historical misperceptions and political disruptions of the 1971-85 period have left the fertilizer market underdeveloped and fragmented but slowly evolving. Even today, many in Uganda wrongly perceive that inorganic fertilizers are not required. Consequently, the size of the market is estimated to be approximately 16,000-20,000 product tons<sup>2</sup> (4,000-5,000 nutrient tons) consisting mainly of urea, diammonium phosphate (DAP), and nitrogen-phosphate-potassium fertilizer (NPK). Fertilizer use levels are low even by African standards and more so from the environmental angle, because 1 kg/ha nutrient application is grossly inadequate to replenish the nutrient depletion of more than 80 kg/ha that Ugandan soils are experiencing.

2. All tons are metric tons.

Lacking domestic production of fertilizers, Uganda depends on imports to meet its domestic fertilizer requirements. Estate crops (sugarcane, tea, and tobacco) dominate fertilizer use (account for about 80%-90% of total use) and imports. There are five to seven importers who mostly import large quantities after winning a tender from estates and small quantities for the smallholder sector. The fragmented and small size of shipments forces importers to pay relatively higher prices. Recent business linkages with importers in Kenya have helped the local importers to achieve 20%-30% lower import procurement prices. Until the size of the market becomes large (over 100,000 product tons per year), it is advisable to continue to pursue regional trade linkages (e.g., with Kenyan importers) to reduce fertilizer prices in Uganda.

Dealer networks are evolving. Training efforts by SG 2000 and the IDEA Project have created a small cadre of stockists (250-300) and distributors (10-15). Although these efforts are laudable, there is a need to strengthen them both qualitatively and quantitatively. As indicated in Matrix A, human capital (business and technical skills) development at all levels is a main constraint to the functioning of markets. Stockists and distributors have limited technical and marketing skills and little access to information and finance. High interest rates and stringent collateral requirements have prevented the development of dealers in rural areas. As a result, farmers have to travel 20-30 km to buy fertilizers. Such long distances naturally discourage the use of modern inputs including fertilizers.

No donors are directly involved in the distribution or procurement of fertilizers. However, there are some fears that Kennedy Round II (KR-II) fertilizers may come back to the market at below market price. It is essential that if KR-II input comes to Uganda, the GOU should put in place mechanisms to dispose of such inputs in a market-friendly manner.

Fertilizer prices are market-determined and competitive. Urea prices varied between US\$ 29,000/bag in Mbale to US\$ 30,000/bag in Masaka, US\$ 32,000/bag in Masindi, and US\$ 30,000-32,000/bag in Kampala. Marketing margins are small, and given the border prices for small shipments and market risks, the prevailing prices of primary products seem reasonable. Increasing the market size, improving access to finance, and procuring in large quantities may result in further reductions in prices to farmers.

Technical knowledge of farmers and dealers about fertilizer products and nutrient requirements is weak. There are few fertilizer demonstrations organized by dealers or government (SG 2000 and IDEA project are exceptions) to educate farmers about the proper use of nutrients. Fertilizer recommendations are based on the work done in the 1960s and therefore need updating. In some cases, farmers are not using appropriate fertilizer products (e.g., use of tea grade 25-5-5+5S as a basal fertilizer in maize production likely yields lower farmer profits than the use of DAP when properly applied as a basal fertilizer).

### **The Seed Market**

Uganda's seed market is in transition—moving from a public sector monopoly to a private sector-based competitive market. Before the liberalization in the early 1990s, seed production and distribution was a public sector monopoly largely operated by USP. The liberalization of the seed market in 1993 opened the market to private companies, but the lack of statutes and institutional and regulatory mechanisms needed for governing the seed operations prevented the active participation of the private sector. However, after 1998 when various institutions, such as the National Seed Board (NSB), the Variety Release Committee (VRC), and the National Seed Certification Service (NSCS), were established and the statutes governing the seed operations were promulgated, the private sector enthusiastically participated. In addition to the USP, there are several private seed companies such as Nalweyo Seed Company (NASECO), Farm Inputs

Care Centre (FICA), Harvest Farm Seeds (HFS), East African Seed Company (EASCo), and others. Seed Company Ltd. of Zimbabwe and PANNAR Seed from South Africa also have an active presence in the market. The USP is in the process of privatization.

Uganda's seed market consists of both informal and formal sectors, and the formal sector includes organizations from both public and private sectors. The informal sector caters to seed and planting material requirements for banana, cassava, and other root crops. It also includes seed production by community-based organizations and farmer-to-farmer sales. No quality control mechanisms operate in this sector. In the formal sector, public sector research institutions, such as Kawanda Agricultural Research Institute (KARI) and Serere Agriculture and Animal Production Research Institute (SAARI), have the responsibility for research and the NARO has the responsibility for breeder and foundation seed production. Because of financial constraints, NARO is not able to supply an adequate quantity of breeder seeds for various crops. Since private companies, such as NASECO, can effectively produce foundation seed, it is unproductive for NARO to spread its limited manpower and financial resources thinly on foundation seed production. Commercial or certified seed is produced by private companies and USP.

Through the efforts of the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)/Eastern and Central Africa Programme for Agricultural Policy Analysis (ECAPAPA), seed policies have been harmonized among Kenya, Tanzania, and Uganda. Such harmonization has helped the development of imports and seed trade between Uganda and Kenya. Vegetable seeds are imported from Europe, Asia, and South Africa. Such opening up of the market has made seed supply easily accessible in many parts of the country. Seeds are sold in 1- and 5-kg bags. Prices are fairly competitive; 1 kg of maize seed (Longe 1) was sold for US\$ 1,000/kg in Kampala and US\$ 1,200/kg in Masindi.

Domestic research capacity, though financially strained, has produced several varieties of seed for various crops. Both open-pollinated varieties (OPVs) and hybrids have been developed, although OPVs dominate the market. To maintain a steady flow of genetic material, research institutions and NARO need financial strengthening.

The main constraints affecting the performance of the seed market are lack of a national seed policy clearly defining the role of various stakeholders and intellectual property rights (breeders' rights), limited supply of breeder seed, lack of pricing policy, limited access to finance for developing dealer networks, and underdeveloped output market.

### **The CPP Market**

In terms of market competition, the CPP market is relatively more competitive. There are many retailers in urban and semiurban areas, but in rural areas few dealers supply products. Annual imports averaged about \$8.2 million during the 1997-2001 period. Lacking domestic production or formulation capacity, all CPPs are imported from Kenya, South Africa, United Kingdom, India, China, and other countries. Insecticides dominate the CPP market, and large farms and estates account for over 80% of the CPP used in the country.

There are 8 to 10 large importers who generally receive products on a supplier-credit basis. There are wholesalers and retailers in the marketing chain, but the distinction between a wholesaler and an importer

or between a retailer and a wholesaler is blurred. Each entity performs some or all of the functions in the marketing chain. Although importers do not face a credit constraint, wholesalers and retailers do and therefore have not been able to develop integrated dealer networks and penetrate into rural areas. At the retail level, dealers sell all inputs and consumer goods. Marketing margins (10%-30%) are generally higher on CPP sales than on seed and fertilizer sales.

Regulatory functions are performed by the Agricultural Chemical Board (ACB) and related agencies. But due to financial and staffing limitations, enforcement of regulation is weak. Technical skills of the dealers are also limited. The existence of outdated pesticides is a serious threat to both human health and the environment.

### **The Potential of the Private Sector**

Although the private sector is in its infancy, it has a good potential to supply inputs in an efficient way. This potential results from the fact that there are already a few private companies involved in import and distribution of seed, fertilizer, and pesticides. These companies are supported by 250-300 stockists selling inputs. Also these companies have developed important linkages with suppliers in Kenya, South Africa, and other parts of the world. On the output market side, Uganda is increasingly becoming integrated into the global and regional markets—maize, flowers, tea, coffee, cotton, sugarcane, tobacco, and horticultural products. Recent emphasis on strengthening the export of selected commodities will further open opportunities for the private sector. More importantly, the GOU has shown an unwavering commitment to develop market-based agriculture in Uganda and is implementing programs and projects to strengthen the private sector capacity. However, the potential of the private sector will be realized only when the constraints identified in Matrix A and other market-specific constraints are removed by implementing the measures proposed in the action plan.

### ***III. An Action Plan for Developing AIMS***

The assessment of all three input markets in Uganda has clearly demonstrated that “deregulation and liberalization” is necessary but not sufficient to encourage private sector participation. Many factors, such as lack of human capital, limited access to finance and information, and weak enforcement of regulatory frameworks, have constrained the effective and full participation of the private sector. The removal of these constraints will help the private sector in realizing its full potential and in reducing prices and improving access to inputs. Consequently, the proposed action plan is heavily geared toward improving the supply side of the market equation in Uganda. Nevertheless, the issues related to technology transfer and output market development are also highlights. These components affect the demand side by improving agronomic (nutrient use) efficiency and economic incentives (better crop prices) and help farmers in the realization of higher yields and more incomes. The following actions constitute the action plan. The first five activities deal with supply-side issues, whereas the next two activities affect the demand side. The last activity, namely, regional integration of markets, has implications for both supply side and demand side of input markets.

1. Creating a supportive policy environment.
2. Developing human capital.
3. Improving access to finance.
4. Promoting market transparency.

5. Strengthening regulatory systems.
6. Promoting technology transfer.
7. Developing output markets.
8. Integrating regional markets.

### **Creating a Supportive Policy Environment**

An enabling policy environment is essential for promoting the development of input markets in Uganda. On the macropolicy front, stabilization of the exchange rate is critical. A depreciating exchange rate not only leads to increased prices of imported inputs but also discourages business development by introducing risks and uncertainties in the investment climate. Efforts are also needed to reduce interest rates to an affordable level. Interest rates vary between 20% and 30% in urban areas and 30% and 48% in rural areas. Such high interest rates are detrimental to market development. Interest rates could be reduced significantly by stabilizing the exchange rate, controlling inflation, and developing financial infrastructures. Unless farmers and dealers can borrow funds at a reasonable rate for purchasing improved inputs, the modernization of agriculture will not be attainable.

The development of roads and other infrastructures in rural areas should receive priority in development efforts because such infrastructures facilitate the integration of rural economies into national economies and help in reducing transaction costs. Ensuring physical security in rural areas also supports the development of well-functioning markets.

On the market development side, well-functioning input markets require a distortion-free policy environment, adequate human capital, access to finance, market transparency and information, and effective enforcement of sound regulatory systems. Because the GOU has removed most of the distortions in pricing and marketing of inputs, the policy environment is generally conducive for input markets. However, in the case of seed production and marketing, there is a need for removing the remaining policy obstacles to private sector participation in the seed market. In particular, because USP has not been privatized, it receives hidden subsidies and public support for its operations and thereby creates distortion in the market by creating an unlevel playing field. USP should be privatized without further delay. Similarly, if inputs are imported through Japanese KR-II grants, mechanisms to integrate such imports with commercial imports should be instituted. Other pillars of market development are elaborated below.

### **Developing Human Capital**

Marketing skills, business acumen, financial management, and technical know-how that are needed to make input markets function properly are severely limited. Business linkages and knowledge of global and regional markets are also constrained. To create a cadre of entrepreneurs at all levels—upstream (linking with global and regional markets for efficient imports) and downstream (wholesale and retail levels reaching rural areas)—human capital formation efforts will be needed. Human capital should be created and/or strengthened by providing training for dealers at all levels—import, wholesale, and retail. Training courses should focus on business planning and development, financial management, and technical knowledge and advice about various aspects of nutrients, products, chemicals, and seed. Training programs will also be needed for seed producers.

Another area that requires efforts in human capital formation is the public sector. MAAIF's capacity to enforce quality control regulations for seed and CPP is limited. Also, MAAIF has few resources to develop and operate market information networks. Adequate resources should be allocated to train manpower for

enforcing regulations and operating market information systems. Analytical capability for processing information and formulating policies and regulations is weak. Overseas training and study tours should be arranged to strengthen analytical capacity as well.

### **Improving Access to Finance**

Limited access to funds for business development is another area that requires improvements. High interest rates and stringent collateral requirements make it difficult to borrow funds from commercial banks. Although some banks have started pilot efforts in lending funds to importers and dealers, such efforts have limited outreach. To encourage risk-averse commercial banks to lend to agriculture, two funds should be created. These are Agricultural Input Import Fund (AIIF) and Small Input Business Development Fund (SIBDF). Under the first fund, input importers should be able to obtain a letter of credit through commercial banks and the Bank of Uganda by putting 30% as a down payment for the needed foreign exchange. The commercial bank dealing with the importer should bear 40% risk and the Bank of Uganda, managing the credit guarantee fund, should bear 30% risk. Experience from other countries indicates that well-trained and viable importers will have little risk of default. Gradually, as business expands, commercial banks may bear a full 70% risk in financing imports. Likewise, a local currency fund should be created to support the development of small input businesses. The same risk-sharing arrangement can be created for this fund. The dealer interested in starting a business should provide 30% of the capital needed to start the business, and the commercial bank should provide a commercial loan for 70% of the required funds. However, to minimize the risk for the commercial bank, the SIBDF should provide a guarantee for 30% of the needed funds, thereby reducing the commercial bank's exposure to 40% of the needed funds. The purpose of this guarantee fund is to encourage commercial banks to lend for business development in the short run and to develop a good clientele for their operations in the long run. Also, the fund will help to reduce collateral requirements because stringent collateral requirement makes it nearly impossible for small dealers to borrow funds for business development. To strengthen the linkage between bankers and dealers, training and consultation should be promoted.

### **Market Transparency Through the Creation and Operation of a Market Information System (MIS)**

Information is crucial for the proper functioning of agricultural inputs and product markets. Dealers, importers, and other participants in the marketing chain need information about local, regional, and global market conditions for inputs and products to identify marketing opportunities and to strengthen their bargaining power to secure lower prices and quality products. The more accurate, detailed, and timely the information, the easier it is to develop market plans and make decisions. With the rapid progress in electronic data processing, it has become very easy now to collect, collate, analyze, and store data.

There is also an urgent need to improve market transparency—a key to market efficiency. This can best be accomplished through creating and operating an MIS within the Ministry of Agriculture and strengthening the market information activities presently in place to include information on input markets (e.g., input and output prices, supply availability, import arrivals). The objective of this activity would be to provide accurate and timely information to all distributors and dealers on fertilizer and other market conditions. In the long term, such activities should be handled by the private sector through dealer associations.

### **Strengthening the Regulatory System**

Although complaints of adulteration of seed or fertilizer products were not frequently reported, there is a need to strengthen the regulatory systems to promote “truth-in-labeling” for input sale and to prevent the

adulteration and sale of outdated CPPs. The ACB Secretariat needs strengthening in terms of manpower and funding. Likewise, NSCS should also be strengthened by providing more resources. As explained earlier, the regulatory agency needs resources for building human capital. To encourage the development of breeder seed production in the country, appropriate rules and regulations should be formulated for intellectual property rights. Attention should also be given to an environmentally friendly disposal of outdated pesticides and insecticides. The educational and enforcement functions of the ACB staff should be separated.

### **Promoting Technology Transfer**

Technology transfer activities should be undertaken to strengthen farmers' knowledge about products, nutrient requirements, application rates, and timing. The principle of "seeing is believing" has a powerful influence on farmers. Demonstrations, short training courses, pamphlets, brochures in local languages, and a monthly Farmers' News bulletin should be used extensively to promote the use of modern technologies. The action plan recommends that over time, private sector dealers should become technology transfer agents while MAAIF should focus on upstream research problems and prepare subject matter specialists to pass on new technologies to dealers who will in turn pass on to farmers thereby creating an effective public-private partnership. While NAADS is focusing on the demand side of technology transfer, the action plan will create a cadre of dealers who will be prepared to supply both inputs and knowledge about technologies on demand. In addition to promoting conventional technologies, efforts should also be made to adapt and adopt biotechnology for various crop operations such as pest control, drought resistance, and quality improvements.

### **Developing Output Markets**

Like input markets, output markets are also underdeveloped and fragmented. Unless output markets are developed and integrated, increased crop output resulting from the adoption of technology could easily depress crop prices, as happened in 2001 for maize. Efforts are needed to integrate different markets nationally and regionally. Dissemination of market information, improved access to finance and storage, and development of agro-processing facilities to add value to farm produce should be promoted. In this context, efforts under the Uganda Grain Trading Limited are laudable, and the emphasis on marketing and agro-processing under PMA is desirable.

### **Integrating Regional Markets**

The size of each input and output market is small in Uganda. Such small size offers little economies of scale in procurement and production. By integrating markets in Uganda with those in Kenya, Tanzania, and other east African countries, significant cost savings could be achieved. To integrate markets, harmonization of policies, standards, and practices should be pursued. By linking Ugandan markets with Kenyan markets in seed and fertilizers, dealers have already realized significant reduction in prices. More efforts are needed to promote the flow of trade under World Trade Organization (WTO) rules among these countries. Market information and training, human capacity building, and formulation of uniform standards and regulations should be encouraged.

### **Expected Benefits of the Action Plan**

The implementation of the action plan will contribute to Uganda's socioeconomic goals of food security, poverty reduction, and environmental protection by reducing input prices (20%-30%), improving access to inputs, and promoting the adoption of modern technologies for both crop production and resource manage-

ment. Also, it will aid in foreign exchange earnings by reducing food imports and increasing agricultural exports.

#### *IV. Institutional Arrangements*

To derive the benefits of synergy resulting from the implementation of different activities, various components should be implemented in a **holistic manner** and through **public-private partnership** arrangements. A strong and sustained commitment from both policymakers and donors is essential to realize full benefits of the action plan. Since the action plan covers activities handled by different entities and departments, it is recommended that the PMA Secretariat should coordinate the implementation of the action plan.

The implementation of the action plan will require a 5-year program costing approximately US \$11 million in project operating costs, US \$7 million in the AIIF, and US \$1.6 million (in local currency) for the SIBDF.

#### *V. Linkages With Donor and National Programs*

The proposed action plan will contribute directly to the achievement of USAID/Uganda's Strategic Objective (SO 7) of creating "expanded sustainable economic opportunities for rural sector growth" by promoting food security and agricultural growth through policy improvement, technology adoption, public-private partnerships, and market development. Various components of the action plan will support the realization of "Intermediate Results" of increased food security and agricultural productivity, greater competitiveness, and stronger enabling environment.

The action plan will also complement the main pillars of PMA. Although PMA has identified marketing and agroprocessing as one of the pillars for modernizing agriculture, it provided little specific guidelines about developing input markets. Hence the action plan fills that void by providing actionable programs for AIMs development. Besides, the action plan will contribute to other pillars including extension, education, technology development, and rural finance.

# An Action Plan for Developing Agricultural Input Markets in Uganda

## I. Introduction

Agriculture is the dominant sector in Uganda's economy with about 3.0 million small-scale farm families producing most of the output. In 2000 the agricultural sector accounted for 43% of the GDP and 85% of export earnings, and it employed 80% of the working population. Furthermore, about 85% of Uganda's population lives in rural areas and depends mainly on agriculture for its livelihood. The employment and incomes generated from their agricultural activities are critical not only for eradicating poverty and enhancing quality of life but also for generating demand for manufacturing industries. In other words, the dominant agricultural population also forms the largest potential domestic market for output from other sectors of the economy.

Since the mid-1980s, the government has pursued macroeconomic reform and encouraged the diversification of agricultural production and export to reduce the country's dependence on coffee. According to the Ministry of Finance, Planning and Economic Development (MFPED), traditional export crops accounted for 72% while nontraditional exports accounted for 28% of the country's total exports in 1999. The respective shares for 2000 were 53% and 47%. Among the nontraditional export crops are maize, grain legumes, sesame, cocoa, pepper, groundnuts, bananas, fruits and flowers. Table 1

**Table 1. Area Under Cultivation for Various Crops**

Crops	Area Cultivated
	('000 ha)
Banana	1,598
Cereals	1,372
Root crops	1,005
Pulses	870
Oil seeds	506
Traditional export crops	440
Horticultural crops	16
<b>Total</b>	<b>5,807</b>

Source: MAAIF and MFPED [2000].

shows approximate areas under cultivation for various crop groups.

At independence in the early 1960s, Uganda had a relatively higher standard of living. The growth in agricultural production averaged 10% in the 1960s (MAAIF and MFPED, 2000). Years of civil war, economic mismanagement, disintegration of public infrastructure and services, and the collapse of an emerging commercial sector in agriculture led to dramatic declines in living standards during the 1970s and early 1980s. By 1990 the country per capita food production was two-thirds of the 1970 level (World Bank, 1998).

In 1987 the GOU introduced an Economic Recovery Program focusing on macroeconomic adjustments and in 1989 launched a Policy Agenda<sup>1</sup> for the agricultural sector to reduce poverty by increasing the incomes of poor households and enhancing their quality of life. Central to these initiatives is a three-pronged approach focusing on developing income-generating activities, providing basic social services, and reestablishing peaceful conditions throughout the country and improving transparency and accountability by strengthening the governance structure.

As a result of the reform program launched in the late 1980s, Uganda achieved strong economic growth and macroeconomic stability in the 1990s. Annual real GDP growth averaged 7.4% during 1994/95 to 1998/99<sup>2</sup> and the overall fiscal and current account deficits decreased (GOU/IMF/World Bank, 1999). Inflation has been low as the rate of consumer price inflation has been brought down from over 100% a year in the 1980s to about 5%

<sup>1</sup>The Policy Agenda emphasized increased efficiencies in agro-processing, trade liberalization, and promotion including removal of marketing boards monopoly, price liberalization, and strengthening agricultural services including the establishment of the National Agricultural Research Organization (NARO), a unified extension system, and regulatory and promotional agencies for key export crops.

<sup>2</sup>GDP growth rate averaged 6.7% annually since 1992/93 (USAID, 2001).

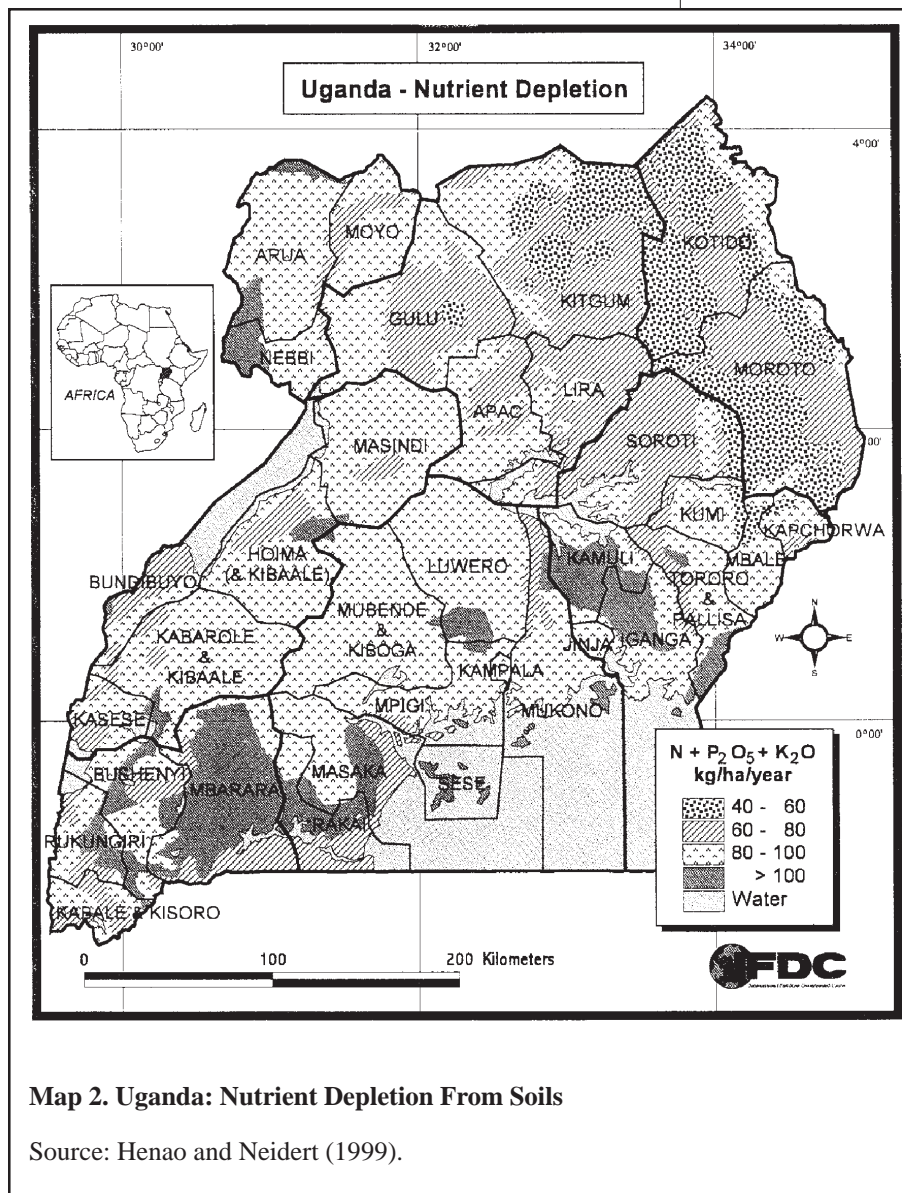


1970 agricultural output level. Moreover, cultivation of marginal lands with inappropriate land management practices has translated into soil erosion and land degradation problems, thereby leading to lower soil fertility and lower yields. A depletion rate of over 88 kg nutrients/ha annually and even higher rates for some key agricultural and high population areas have been reported (Map 2). Unless nutrient losses are reduced, the sustainability of the natural resource base (soils and forests) is questionable.

It is clear that Uganda faces many socioeconomic challenges including eradicating poverty (consistently across social groups), ensuring food security, providing health and education services, and protecting the environment.

But, it is equally clear that agriculture is and will continue to be the key economic sector for Uganda to successfully address these challenges. It contributes to ensuring the country's food security, provides raw materials for local industries, generates foreign exchange, and provides employment and incomes for a large proportion of the population, thereby contributing to eradicating poverty.

However, for Uganda's agriculture to be able to bring about the economic impetus needed to eradicate poverty, ensure food security, and protect the environment, it would have to be transformed by shifting the current dominant subsistence-oriented farming systems towards more market-oriented production based on knowledge, greater specialization, exchange, and capturing of economies of scale. This agricultural transformation thus involves a greater reliance on modern technologies and management practices to increase productivity at the farm level. This in turn requires a greater reliance on modern institutional support, well-functioning input and output markets, and increased integration of agriculture with other sectors of the domestic and international economies. Over time, as agriculture and the whole food system continue to grow in absolute terms and generate important growth linkages to the rest of the economy, an increasing proportion of national output and employment would be generated by sectors other than agriculture. This will arise because as farm incomes rise, farmers will increasingly spend a greater proportion of their income on non-agricultural goods (Engel's law) thereby increasing demand for products and employment in the manufacturing sector.



**Map 2. Uganda: Nutrient Depletion From Soils**

Source: Henao and Neidert (1999).

inherently fertile, the use of modern inputs such as fertilizers, pesticide, and irrigation water remained very low. The research system has been able to develop some good crop varieties, but their adoption has been limited partly because of the poor distribution system of complementary inputs (i.e., fertilizers and pesticides) and the poor quality and effectiveness of the public extension network. As a result, observed yields increasingly became far from exceptional even by African standards. In recent years, the USAID's IDEA project and the MAAIF/Sasakawa-Global 2000 (SG 2000) project have demonstrated increased yield potential of up to 170% for maize with a production package that includes improved seeds and fertilizers (IFDC, 1999).

It is important to recognize that increasing productivity at the farm level is absolutely necessary but not sufficient to progressively transform agriculture and the national economy from one based on increases in labor and land to one based on greater reliance on knowledge and markets. For this to happen, Uganda must also develop low-cost means of exchange, information, and communication. High transaction costs in the economy can block structural transformation by making it too costly for economic agents to rely on the specialization and exchange necessary to take advantage of the new technologies in the food system (World Bank, 2002).

### **Recent Developments and New Initiatives**

To consolidate the gains made under the macroeconomic adjustment and sectoral structural reform program launched in the late 1980s and further reduce the poverty incidence in a more consistent way, the GOU has launched a number of important programs at the core of which agriculture is given a high priority along with education and health. These programs emerged in the last 5 years through an extensive consensus building and consultative process using participatory appraisals and national seminars. The Vision 2025 (GOU, 1999) establishes the goal for eradicating mass poverty. There are three main frameworks operationalizing the government plan, namely, the 1998 Poverty Action Fund (PAF), the 1999 Medium-Term Competitiveness Strategy (MTCS), and the 2000 Poverty Eradication Action Plan (PEAP)—initially developed in 1997. These frameworks are supported by a number of important sectoral programs, which for agriculture is the 2000 Plan for Modernization of Agriculture<sup>6</sup> (PMA).

<sup>6</sup>Other sectoral frameworks include the Education Sector Investment Plan and the Health Sector Support programs.

The PEAP provides a framework for government planning and policy development in all sectors for reducing the poverty incidence from 44% in 1997 to 10% by 2017. The PAF is a transparent mechanism to direct debt relief resources accruing to Uganda under the Heavily Indebted Poor Countries initiative to social development, particularly in education, health, water and sanitation, farm-to-market roads, agricultural extension, and micro-finance. The MTCS is intended to eliminate the main constraints to private sector growth, including competitiveness in regional and world markets.

The PMA provides a holistic framework for eradicating poverty through interventions aimed at improving the welfare of poor subsistence farmers. It recognizes the limited use of modern inputs and aims to accelerate agricultural growth by introducing yield-enhancing technologies and increasing market penetration (commercialization) and competitiveness without compromising household food security. It is derived from the government commitment to restore the private sector as the main engine of economic growth, develop a conducive legal and regulatory framework, and ensure grassroots self-determination both economically and politically.

The PMA has become the blueprint to guide GOU's efforts towards agricultural development and transformation. Under the PMA, the GOU plans to focus on NAADS research and technology development, agricultural education, rural financial services, marketing and agro-processing, physical infrastructure, and natural resource management and utilization.

To strengthen the demand-driven extension activities, the GOU has already launched NAADS on a pilot basis in six districts—Mukono, Kibale, Arua, Kabale, Tororo, and Soroti. Under this pilot effort, extension services are decentralized and local governments are allocated funds to provide farmer-demanded extension support.

As such, farmers will determine the work program and activities of the private extension agents (or advisor) who are effectively their employees. This is expected not only to improve the efficiency and sustainability of agricultural extension service delivery but also to gradually reduce the share of public financing of farm advisory cost to no more than 50% by the end of 25 years of NAADS.

On the research front, NARO designed a plan to respond to the research challenges for the modernization of agriculture. This plan decentralizes NARO's activities to ensure that they are in line with farmers' needs (or

client-driven) and take advantage of indigenous knowledge and technologies.

The decentralization of technical services delivery entails substantial financial transfers from the central to local governments. To operationalize the PMA, non-sectoral conditional grants for the sub-counties will be introduced to empower them financially and enhance two-way planning and budgeting. The PMA will support capacity building of local governments to enhance their ability to plan strategically. The PMA will also support capacity building of sector ministries for strategic planning, policy formulation, budgeting, provision of a technical backup to local governments and private institutions. The PMA Planning and Financing Forum and the PMA Steering Committee provide the coordination mechanism aimed at ensuring a harmonious implementation of the plan and compliance with the PMA principles. Donors will support the PMA through a “basket” funding support mechanism, which will be disbursed under the guidance of the PMA Steering Committee.

### **Role of Agricultural Input Markets in Modernizing Agriculture**

The economic growth of Uganda in the 1980s and 1990s has led to profound changes in the role of the public sector in agriculture. This includes significant liberalization and complementary reforms that downsized, privatized, and decentralized public agricultural institutions. While the strategy of expanding the area under cultivation that largely accounted for agricultural growth over the past 10 years may continue for some time, the GOU recognizes that it no longer can rely upon extensification as the main source of growth to eradicate poverty and ensure food security. The growth impact of increases in area cultivated is not likely to keep pace with population growth, particularly because it involves expansion into marginal lands and fragile ecological areas.

Therefore, farmers would have to increase land and labor productivity by using modern farming techniques, including quality seed of improved varieties, CPPs, fertilizers, and soil management practices that conserve water and soil, reduce weeds, and build soil fertility. Furthermore, farmers would have to shift away from traditional subsistence farming and increase their market orientation. As is the case for food security, agricultural commercialization requires increased agricultural productivity and access to both input and output markets. Indeed, the PEAP clearly recognizes the importance of markets and stresses that access to markets helps reduce poverty because markets make it possible for farmers to

take advantage of the opportunities created by the liberalized economy.

Prominent in Uganda’s strategy for reducing the poverty incidence to 10% by 2017 is a greater adoption of quality seed of improved varieties, fertilizers, and CPPs supplied through efficient markets supported by appropriate government policies and facilitating institutions. Though private firms now supply a large proportion of agricultural inputs, their high cost and unavailability in rural areas continue to be a concern. The efficient functioning of these markets would ensure the timely availability of appropriate and quality inputs at affordable prices. In addition, farmers’ choices of products would increase, and their knowledge and use of the inputs would eventually improve as traders develop their clientele. Ultimately agricultural productivity, domestic production, and returns to farmers and input traders would increase as soil fertility levels are restored, improved, and/or maintained.

### **Goal, Scope, and Objectives of the Action Plan**

The goal of this action plan is to identify specific actions needed for the development of well-functioning agricultural input markets<sup>7</sup> and thereby improve food security, reduce poverty, and protect the environment in Uganda. The proposed plan is based on an assessment focusing primarily on the structure, conduct and performance of, and constraints faced by seed, fertilizer, and CPP markets in Uganda. However, because successful market development requires a holistic approach, the assessment also examines factors affecting input demand such as technology transfer, access to credit, and the performance of output markets. The assessment is based on the following objectives:

1. Review the recent trends in the use and import of fertilizer, seed, and CPPs.
2. Assess the suitability, adequacy, and efficiency of the organizational arrangements—public, private, and NGO enterprises involved in marketing and distribution of inputs.
3. Evaluate the policy and regulatory environments and their impact on input markets.
4. Analyze availability of and access to finance for agricultural enterprises.

<sup>7</sup>The term “agricultural input market” is used in this document to include the whole range of activities involved in the importation, production, distribution, and final use of these inputs.

5. Evaluate donor-funded and government-supported programs for input supply and their impact on private sector participation in input marketing.
6. Identify constraints to marketing and distribution of inputs.
7. Develop a plan identifying the specific actions needed and the role of key stakeholders to address the identified constraints and thereby strengthen the functioning of competitive input markets in Uganda.

The assessment focuses on the identification of constraints affecting the supply side of the input market because the system changed from a public sector monopoly to a private sector-based competitive market that has failed to perform efficiently. Various activities by IFDC and others have indicated that the transaction costs associated with the supply of agricultural inputs to small-scale farmers in Uganda and throughout most African countries are high. Consequently, alleviating the under-

lying constraints and strengthening the capacity of the private sector could lead to a significant reduction in these costs and thereby enhance the supply of modern inputs and the profitability of their use.

Focusing on the supply side is not to suggest that the demand-side factors are not important; quite the contrary, recent evidence in Uganda from the dramatic decline of the grain and traditional export crop prices shows that the performance of output markets is critical to the development of the input market. However, limited resources and limited previous work on the supply-side issues necessitated that the assessment focus on the supply side of the market equation. Furthermore, a competitiveness study looking at output marketing opportunities is being conducted under the PMA. Because it focuses on the development of agricultural input markets, the proposed action plan complements Uganda's agricultural development programs in general and the PMA in particular.

## II. The Agricultural Input Markets in Uganda: An Assessment

This section includes an assessment of the policy environment, functioning and performance of input markets, and potential of the private sector.

### The Policy Environment

Due to successful implementation of economic reforms, there are no significant policy distortions in the market. Specifically, no parastatals are involved in distributing inputs; no control or regulation of prices is enforced; and no subsidies are given on inputs. However, there are a few concerns that should be addressed so that no impediments are created for the private sector participation. These include the recently stated intention of the government about the free distribution of seed, seedlings, and planting materials for selected crops. Distribution of inputs through NGOs that do not recover the full costs of inputs may become a problem for private sector dealers. Besides, there are some input-specific issues. For example, free or subsidized supply of breeder seed from NARO to the USP is a matter of concern. Likewise, poor enforcement of quality control regulations poses a serious threat to orderly development of well-functioning input markets.

While there are no pricing distortions in the market, the macroeconomic environment remains rather market unfriendly. Continuous devaluation of the Ugandan shilling (USh), high interest rates, and limited access to finance are serious constraints that discourage private sector involvement in agricultural marketing. Interest rates vary from 30% to 48% in rural areas. The unwillingness of commercial banks to lend for agriculture and agribusiness operations makes it difficult for emerging entrepreneurs to start new business ventures.

On the market development side, lack of market information, inadequate access to finance, limited marketing and business skills, and poor enforcement of regulatory frameworks are dominant challenges. Confronting these challenges will require significant resources and commitments. These challenges are comprehensively elaborated in the context of each input market (seed, fertilizer, and CPP) and are briefly summarized in Table 2.

### The Fertilizer Market: Structure, Functioning, and Constraints

The application of mineral fertilizer has long been a low priority in Uganda. In the early 1960s, Ugandan farmers used about 2,600-3,200 tons of plant nutrients per year. Consumption of fertilizer increased to 8,100 tons of nutrients in the early 1970s. However, due primarily to political instability, fertilizer use declined to essentially no use of mineral fertilizer in the early 1980s (Table 3). During the past two decades there has been little emphasis on fertilizer use,<sup>8</sup> and the market in Uganda remains very small even by African standards. It is estimated that Ugandan farmers used only about 4,800 tons of fertilizer nutrients (16,000-19,000 product tons) in 2000. During the same year, Kenyan farmers used 127,600 tons of plant nutrients.

Despite the small size of the market, the product mix available in Uganda is rather extensive, reflecting the grade (nutrient)-specific requirements of the commercial crop growers (estates and horticultural crop farms). The following products have been available, albeit on a spo-

<sup>8</sup>Until the late 1990s, many in Uganda believed that the soils in the country were sufficiently fertile that there was no need to apply fertilizers. This misperception has contributed to the low level of adoption of inorganic fertilizer.

**Table 2. Market Development-Related Constraints in Uganda**

Market	Constraints				
	Policy	Human Capital	Finance	MIS <sup>a</sup>	RF <sup>b</sup>
Fertilizer	Mild	Severe	Severe	Severe	Mild
Seed	Mild	Severe	Severe	Severe	Mild
CPP	None	Severe	Mild	Severe	Severe

a. MIS = Market Information System.

b. RF = Regulatory Frameworks.

**Table 3. Uganda: Fertilizer Consumption, 1961-2000**

	Nitrogen	Phosphate	Potash	Total NPK
	(tons nutrient)			
1961	1,200	1,100	300	2,600
1962	1,300	1,100	300	2,700
1963	1,500	1,200	500	3,200
1964	1,500	1,300	800	3,600
1965	1,864	1,500	1,000	4,364
1966	2,572	1,700	1,000	5,272
1967	1,709	1,327	740	3,776
1968	1,981	1,495	1,250	4,726
1969	2,220	1,150	1,200	4,570
1970	4,000	2,000	1,000	7,000
1971	4,400	2,500	1,200	8,100
1972	4,000	2,000	1,696	7,696
1973	4,000	2,400	787	7,187
1974	1,600	1,300	700	3,600
1975	872	660	157	1,689
1976	963	430	263	1,656
1977	300	500	300	1,100
1978	0	300	0	300
1979	0	0	0	0
1980	700	100	0	800
1981	500	100	0	600
1982	0	0	0	0
1983	0	0	0	0
1984	400	100	0	500
1985	200	0	0	200
1986	262	126	0	388
1987	789	374	12	1,175
1988	107	12	12	131
1989	250	55	50	355
1990	92	100	0	192
1991	500	300	400	1,200
1992	400	100	300	800
1993	1,300	400	500	2,200
1994	1,000	400	500	1,900
1995	800	200	300	1,300
1996	200	200	200	600
1997	200	200	200	600
1998	1,825	939	771	3,535
1999	2,077	1,320	1,082	4,479
2000	2,200	1,500	1,100	4,800

Source: FAO [2001].

radic basis—urea, ammonium sulfate (AS), calcium ammonium nitrate (CAN), DAP, monoammonium phosphate, triple superphosphate (TSP), single superphosphate (SSP), muriate of phosphate, 17-17-17, and a broad range of specialty grades such as 25-5-5+5S and 10-20-20+B+S. Such a broad mix of product grades is rather more typical of a developed large market.

At the stockist level, only two to three grades (urea, DAP, and 25-5-5+5S) are typically available for sale to smallholder farmers. These products are applied to such staple crops as maize and vegetables. The NPK grade 25-5-5+5S is a tea grade but is commonly used as basal application in maize and vegetable production; it is not the most cost-effective product for use by smallholders planting maize and vegetables. In total, NPKs account for 40%-50% of the market, and urea and DAP/TSP account for 25% and 9%, respectively, of the market.

Uganda is totally dependent on imports for all mineral fertilizers.<sup>9</sup> Currently, all fertilizer

<sup>9</sup>Uganda possesses phosphate rock deposits that have been commercially mined in the past. The Busumbi deposit was in production from 1945 to 1963, and the Sukulu mine operated from 1963 to 1978. The rock was used to produce SSP (0-18-0), which was used in Uganda and exported to Kenya and Tanzania. SSP is an excellent phosphate-bearing fertilizer. However, because of neglect of the factories during the 1970s and 1980s, the country is no longer producing fertilizer. The 1999 efforts to create a joint venture between a Canadian and a Ugandan firm to restart the SSP factory did not materialize.

imports are on a commercial basis and handled by private firms (Table 4). In the past, nearly one-half of fertilizer imports were supplied through Japan's (KR-II) program (Table 5). The most recent KR-II import was in 1999. There is some speculation that the Government of Japan is considering providing fertilizers to Uganda in 2002/2003 under the KR-II program.

### Market Structure and Functioning

The fertilizer marketing system in Uganda, while fragmented and dysfunctional, is slowly evolving. All firms engaged in the fertilizer business are private entities with varied (but generally quite limited) experience in agri-input marketing. The marketing chain consists of 5-7 importers (excluding imports by commercial growers),

**Table 4. Estimated Import Quantities–2002**

Company	Urea	CAN	10-20-20+B+S	TSP	SSP	DAP/ MAP	MOP	25-5-5+5S	Other	Total
	(mt)									
Kakira Sugar Works	1,500			400						1,900
Balton (U) Ltd	2,700	100		650	45	350	200	800		4,845
Uganda Tea Development Corp.								1,500		1,500
Sugar Corp. of Uganda, Ltd.	500	500								1,000
British American Tobacco (BAT) Company		300	1,610							1,910
Tilda	200			100						300
Other	500								500	1,000
<b>Total</b>	<b>5,400</b>	<b>900</b>	<b>1,610</b>	<b>1,150</b>	<b>45</b>	<b>350</b>	<b>200</b>	<b>2,300</b>	<b>500</b>	<b>12,455</b>

Source: Authors–estimates.

**Table 5. KR-II Fertilizer Imports to Uganda, 1988-98**

Year	Type	
	Urea/CAN	NPK (25:5:5)
	(tons)	
1988	-	1,080
1989	-	1,620
1990	200	-
1991	200	600
1992	-	1,830.6
1993	-	463.1
1994	-	1,124.16
1995	-	3,865.2
1996	-	-
1997	-	-
1998	-	-
1999 <sup>a</sup>	3,500 <sup>b</sup>	1,800

a. Preliminary estimates based on requests submitted by the MAAIF to JICA.

b. Includes 1,500 tons of CAN.

Source: Department of Crop Protection, MAAIF (Personal Communication).

about 15-20 wholesalers, and 250-300 stockists.<sup>10</sup> Based upon an estimated market of 16,000-20,000 tons of fertilizer products, of which about 50% is imported by commercial crop growers, the individual firms importing fertilizer as a business activity typically import less than 1,000 tons each per year. This level of imports is far too small to generate any of the benefits normally associated with economies of scale in fertilizer importation. Traditionally, imports have been procured from suppliers in South Africa, the Middle East, Mauritius, and Europe. Recently, importers have started to procure supplies from Kenyan importers. Essentially all imports are via the Port of Mombassa, Kenya (except direct imports from Nairobi, Nakuru, and Eldoret).

Most Ugandan fertilizer importers/wholesalers function as brokers. They import fertilizer only after tendering for and being awarded a contract by commercial crop growers. Due to market risk and the high cost of credit, importers do not maintain significant inventories of fertilizers for resale. Albeit, some do maintain a small inventory for sale to wholesalers and stockists, including those under the MAAIF, USAID/IDEA, and SG 2000 programs. With the exception of those importers/wholesalers and stockists that participate in the SG 2000 and USAID/IDEA programs, there is little effort underway to stimulate demand for fertilizer through promotional activities such as demonstrations, wall posters, farmer education programs, and media campaigns.

The SG 2000 and the USAID/IDEA projects are working with selected importers to assist in the development

<sup>10</sup>In recent years Uganda firms involved in fertilizer importation include Balton, Magric, General and Allied, Triga Chemicals, Sukura Agro Supplies, and El Shadai.

of a network of stockists. The Agribusiness Development Centre (ADC)/IDEA has been training distributors and stockists in business management, technical skills, and financial management. Sessions covered include product knowledge, handling and storage, record keeping, marketing, and promotional techniques for seeds, fertilizers, and CPPs. Similar training has also been conducted by SG 2000. With the help of extension staff, some rural traders were identified and invited for 1-day seminars among others to provide them deeper insight on the role of the stockists network. Formal training courses were organized. SG 2000's rural stockist program has trained several extension workers and rural traders (Table 6). However, the stockist networks remain extremely limited in terms of number in the network and the geographic coverage. El Shaddai, an importer/wholesaler based in Mbale, has one of the largest networks in the country with five branches and sells to an estimated 60 stockists. Most of Uganda's farmers, and particularly those in non-market areas, do not have convenient access to fertilizer supplies. The stockists' development efforts of SG 2000 and IDEA need strengthening in both geographical coverage and human capital development.

**Fertilizer Pricing**—There is no direct subsidy on fertilizers in Uganda. Prices are determined on the basis of market factors: costs, competition, supply-demand factors, and individual firm marketing/pricing strategy. Simple "cost-plus pricing" is the most common approach to fertilizer pricing in Uganda. Most enterprises that offer fertilizer for sale quote both a retail price (for sales to farmers) and a wholesale price (for sales to stockists). The price spread is typically US\$ 2000/bag.

Because all of Uganda's fertilizer supplies are sourced through importation, an examination of fertilizer prices

**Table 6. Rural Stockists Development by SG 2000 Since 1997**

Year	District	Workshops	Participants	Stockists Involved in Trading
1997	7	2	120	65
1998	14	3	240	80
1999	18	3	400	105
2000	20	3	140	171
2001	25	1	40	220
2002	25	1	45	225

Source: SG 2000/Uganda (Personal Communication).

begins with import costs. In the late 1990s, import costs by Ugandan firms were extremely high by world standards due to the high transaction costs (e.g., low volume purchases, limited competition, high transport costs, knowledge gaps, depreciating value of the Uganda shilling, and high interest rates). During the past 2 years, Uganda importers/distributors have increasingly sourced supplies from Kenya. This practice has resulted in a very substantial reduction in import costs due to economies of scale achieved by Kenya importers and competition-induced low margins in Kenya. For example, in the case of two popular “food crop fertilizers,” urea and DAP, average retail prices in Uganda declined from US \$26.25 and US \$31.25 per 50-kg bag, respectively, in 1998 to US \$16.70 and US \$20.55/per 50-kg bag, respectively, in late 2000. In early 2002 urea and DAP retail level prices in Mbale were US \$16.20 and US \$19.60/50-kg bag, respectively. Considering the high cost of transportation of fertilizer from Kenya to Uganda, these prices are indicative of a reasonable level of competition and efficiency in the marketplace. It is interesting to note that traders in Masaka (over 135 km from Kampala) were able to offer prices as competitive as those in Kampala. The main reason for this efficient outcome is the fact that

some grain traders in Masaka have established direct links with wholesalers in Nairobi and have combined the export of grain and beans with the import of fertilizers. This arrangement yields a considerable saving in transportation costs.

Estimated international market prices for urea and DAP are presented in Figure 1. The estimated cost structure for DAP based upon imports via Kenyan firms (which do realize the advantages associated with economies of scale in fertilizer import transactions) is presented in Figure 2.

**Donor Involvement**—Currently, there is no direct involvement of donors in the supply of fertilizers in Uganda. There is a growing awareness among donors (as well as government officials and farmers) of the need to use yield-enhancing technologies, including mineral fertilizers. The PMA is designed to address constraints to agricultural productivity, including the low use of improved inputs and poor access to credit. Pro-market development efforts include initiatives by USAID (IDEA Project) and the SG 2000 program. Both programs include components that address improving smallholder access to yield-enhancing inputs and credit for emerging stockists. The

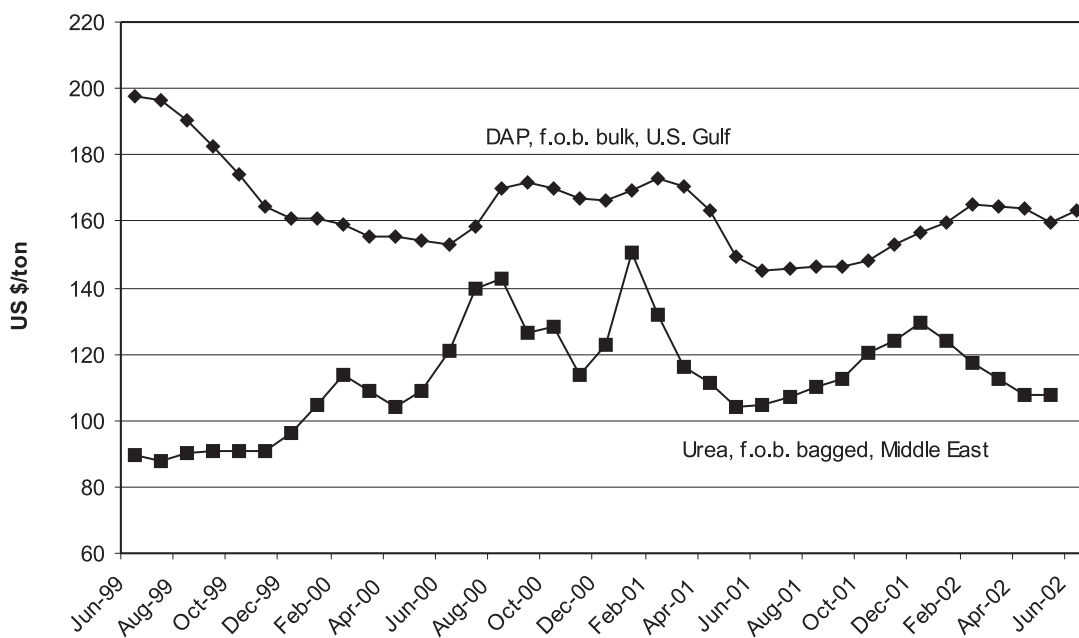
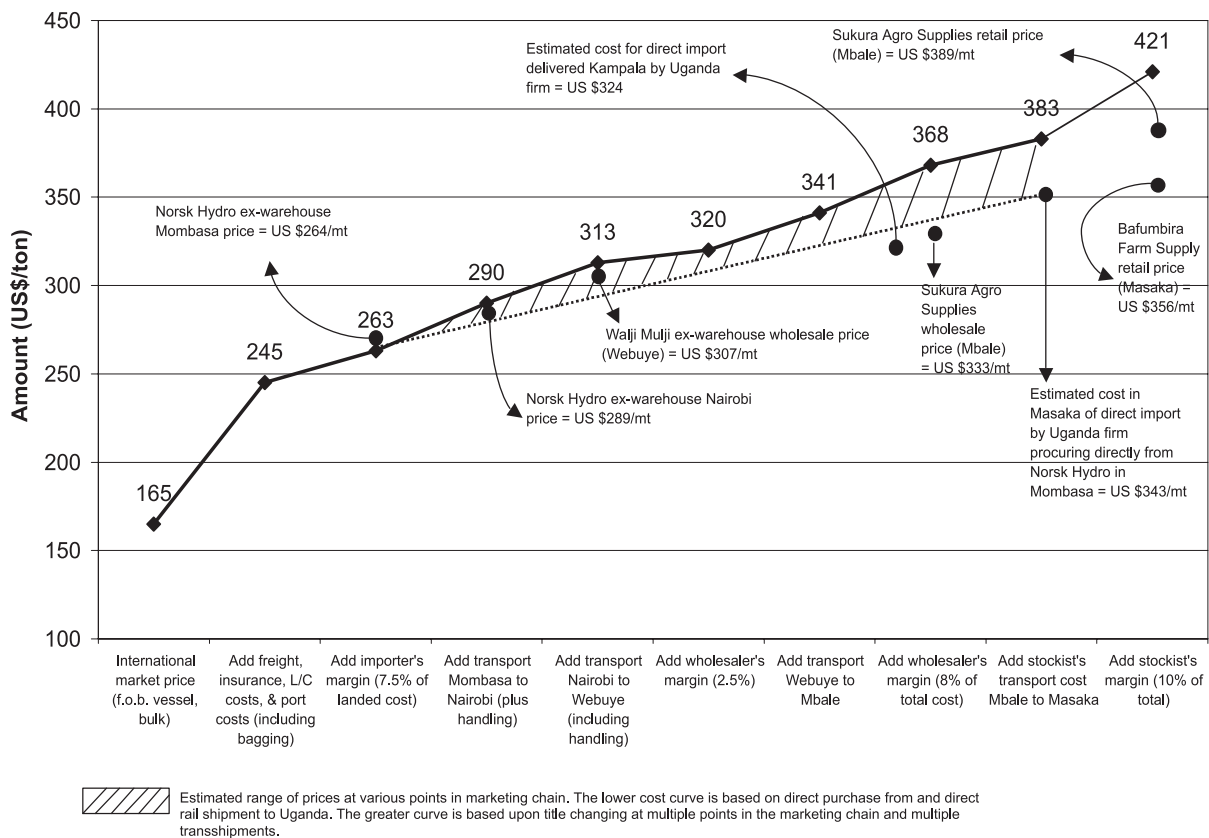


Figure 1. Trends in International Market Prices



Source: "An Assessment of Fertilizer Prices in Kenya and Uganda: Domestic Prices vis-à-vis International Market Prices," prepared by IFDC in collaboration with SG 2000 and Carter Center, January 2001.

**Figure 2. Estimated DAP Pricing and Cost Structure (December 2000)**

PMA resulted in the formulation of the NAADS Program. The NAADS Program is designed to empower farmers, particularly the poor and women, to proactively manage agricultural advisory services. It seeks to increase the availability of advisory and information services to farmers and simultaneously increase farmer involvement in technology development and strengthen their linkages with markets.

**Credit**—Fertilizer procurement and stockholding is capital intensive. At the importer level, the firms involved in the fertilizer business either use their own funds or are able to secure commercial credit. The credit terms vary by customer-bank relationship with interest rates typically being 24%-36% per annum. In general, credit availability for large companies active at the import level has improved considerably. Interest rates are high, but credit availability is not a severe constraint for those companies involved in exporting agricultural commodities. However, in the case of enterprises whose primary busi-

ness is in agri-input supply, credit availability is problematic.

At the stockist and farmer levels, credit availability is a serious problem. Bank liquidity does not appear to be a constraint, but banks are reluctant to lend to this sector due to a general lack of understanding of fertilizer business operations and a risk-averse attitude towards agriculture and collateral requirements act as a major constraint. Some stockists do receive a credit guarantee from SG 2000 and IDEA; they in turn occasionally pass the credit on to farmers with repayment for fertilizers due at harvest. However, even agri-input wholesalers who have been in business for several years face difficult challenges in securing credit. Any effort to develop the fertilizer market will have to include developing improved access to credit at all levels—importer, wholesaler, retailer, and farmer.

**Dealer Services**—To maximize economic returns from fertilizer use, it is essential to use appropriate yield-

enhancing products and apply them properly. The knowledge of dealers/stockists in terms of advisory services to farmers is deficient. Stockists are aware of the need for basal application and topdressing in crop production. They are also generally aware of application practices (e.g., need to cover the urea with soil to minimize N volatilization). However, they are not aware of correct application dosages, the role of the primary and secondary nutrients (N, P, K) in crop production, and the cost per unit of nutrient for different fertilizer products.

**Fertilizer Recommendations**—The Uganda Department of Agriculture completed a reconnaissance soil survey (at a scale of 1:250,000) in the late 1950s. The Food and Agriculture Organization (FAO) of the United Nations and the MAAIF conducted fertilizer trials in the 1960s. KARI, under NARO, is responsible for soil fertility research, including development of national fertilizer recommendations. However, its resources are very limited, and its research programs are commodity based. Recommendations based on fertilizer trials done by FAO and MAAIF were published in the early 1970s. These trials were on a district basis for maize, cotton, groundnuts, etc., based on low-analysis products (e.g., AS and SSP) that were prevalent at the time. In view of the change in soils, varieties, fertilizer products, and economic conditions, a new survey should be conducted to revise the recommendations developed during the early 1970s.

**Regulatory Framework**—There is no regulatory framework for fertilizers in Uganda. There is little evidence of product adulteration, underweight bags, mislabeling, etc., at this time. Nevertheless, as the fertilizer market increases in size, it is likely that unscrupulous traders may attempt to engage in activities that violate the concept of “truth-in-labeling.”

### **Constraints Affecting the Performance of the Fertilizer Market**

Private sector investment in the fertilizer business in Uganda has primarily been limited to the procurement of physical facilities (shops) and fertilizer stocks. The following factors seem to constrain the participation of private traders and dealers.

**Policy Related**—The policy environment is not viewed as a significant direct constraint to fertilizer market development. However, the absence of clear policy guidelines on the provision of donor supplies under the KR-II program is an underlying threat to investment by the private sector. The absence of an appropriate regulatory system is a potential problem area that presents op-

portunities for product adulteration and/or mislabeling of bags.

**Output Market Instability**—Demand for fertilizers is a derived demand. Until such time that output market development and stability is suitably addressed, the market will continue to be slow to develop.

**Lack of Capital and Liquidity**—Access to capital is a serious constraint to both private investment in the fertilizer business (importers and stockist level) and to fertilizer purchase by farmers. Collateral requirements to secure working capital loans for fertilizer stockholdings are problematic for most importers and stockists. The cost of capital is also very high, but the issue of collateral requirements to secure loans appears to be a greater burden on most micro enterprises. Farmers have little if any access to capital to purchase fertilizer except through outgrower schemes and informal credit markets.

**Human Capital**—Misperceptions of the need for inorganic fertilizers still persist in some areas. Moreover, the knowledge of fertilizer marketing functions and proper use practices, including appropriateness of products for specific crops, is deficient. Fertilizer dealers are not providing proper advisory services to farmers. Importers and distributors are not yet adequately knowledgeable in international fertilizer market conditions, and awareness of regional trade opportunities is weak. In the banking sector, knowledge of agri-input business operations is very limited, leading to a general reluctance to provide adequate loans for working capital without excessive collateral requirements.

**Market Information**—At all levels in the Uganda fertilizer market, there is a serious information void with regard to market conditions. Information on domestic stock levels, import arrivals, location-specific prices, etc., is deficient for both planning of marketing activities and proper functioning of markets. In order for market mechanisms to function properly, improved market transparency is essential.

### **The Seed Market: Structure, Functioning, and Constraints**

The development and establishment of an efficient, self-sustaining seed market is recognized as crucial for increasing agricultural production in Uganda. The seed industry was initiated in 1969, when the GOU started the first seed multiplication scheme to provide improved seeds of the traditional food crops—cereals, legumes, and oilseed crops. The agricultural research department

was already generating some good varieties. The seed scheme consisted of two components: seed production and seed quality control. Seed production was carried out on government farms and by contract growers, and purchased by local Cooperative growers' unions for sale to farmers. The period 1971-85 was characterized by political and civil upheavals. This severely affected the seed industry infrastructure and production activities, which limited the availability of improved seed to the farming community. During this period, the informal seed sector played a vital role. The seed multiplication scheme received funding and support from Overseas Development Aid, FAO, and the European Economic Commission (EEC) over the years; it was renamed the Uganda Seed Project (USP) in 1983. In 1988, the Grain Legume Project was established in Kasese for the multiplication and marketing of legume seeds (beans and soybeans) with the financial support of Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

In the early 1990s, the seed industry was fully liberalized in line with the overall government policy. This removed the public sector's monopoly in the production and supply of improved seeds and opened the door for open competition with private seed dealers. For its part, the GOU obtained a loan from the African Development Bank in 1993 to rationalize the public seed sector, commercialize it, and eventually privatize it in order to further enhance the production and marketing of improved seeds. As part of the rationalization process, the GTZ-funded Legume Seed Project was merged with the mainstream USP, previously funded by the EU. This was followed by the enactment of the seed statute, which separated the regulatory functions from the commercial activities of the USP. However, the private seed companies entered the seed market after 1998 because of shortcomings in statutes and regulations and delays in the creation of supporting institutions such as NSB, NSCS, and VRC.

### **Market Structure and Functioning**

In 1994, the Agricultural Seeds and Plant Statute was enacted. The primary purpose of this legislation is to promote, regulate, and control the various aspects of the seed industry, namely,

- National seed policy.
- Variety testing, release, and registration.
- Multiplication/production.
- Conditioning/processing.

- Seed marketing.
- Seed imports/exports.
- Quality assurance of seeds/other planting materials.
- Licensing and monitoring all seed dealers.

The statute stipulates the establishment of a NSB, a VRC, and a NSCS. The NSB advises GOU on seed policy issues and administers the statute. The VRC controls the registration and release of all improved varieties, and NSCS has the overall responsibility of seed quality assurance. The statute has been reviewed in line with the harmonization of seed laws and regulations in East Africa.

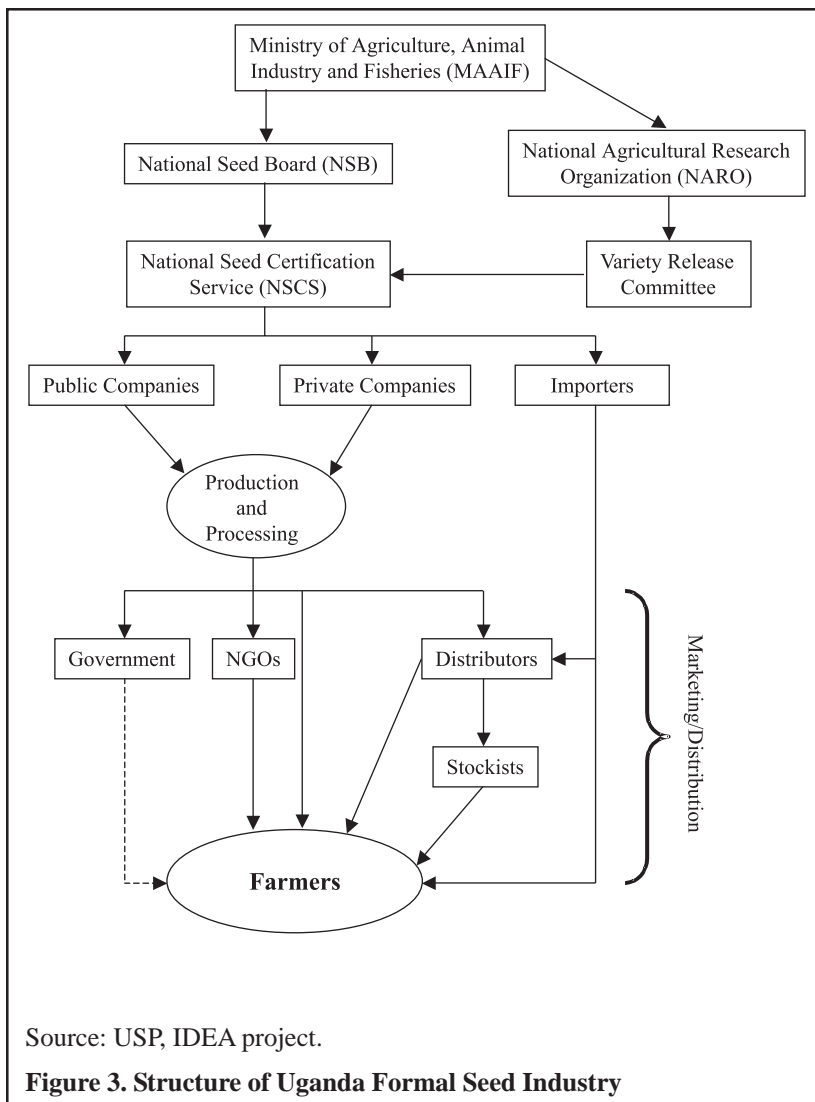
The seed market consists of both informal and formal seed sectors. The informal sector consists of various NGOs, community-based organizations (CBOs), and individual farmers or farmer groups that produce seeds and exchange them either freely or at nominal charges. The informal sector plays an important role in the distribution of planting materials for vegetatively propagated crops (banana, cassava, and others) but has also been crucial for all other seeds, particularly during times of political turmoil or natural disasters.

The formal sector includes both private and public sector registered seed companies and is responsible for multiplication and marketing (Figure 3). The public sector operates under the overall supervision of the MAAIF and consists of NARO, the statutory regulatory agencies (NSB, NSCS, and VRC), public seed companies, and projects such as Uganda Seed Project (now Uganda Seed Limited).

### **Public Sector Seed Organizations**

**National Agricultural Research Organization**—The national research program is a key part of the seed industry in Uganda because it is the main source of new crop varieties. It is run by NARO, which was established in 1993 by an Act of Parliament to coordinate public agricultural research and development activities in all aspects of crop, fisheries, forestry, and livestock. Various institutions have the mandate for research and variety development and breeder seed production of specific crops (Table 7).

Currently, NARO is responsible for the production of both breeder and foundation seed because the products are considered a public good. In this respect, all the varieties that have been bred have previously been taken up for further multiplication by USP. Breeder seed is sup-



plied in small quantities of 1-100 kg per variety, which is insufficient to meet the growing demand of the liberalized seed industry. There are strong arguments against NARO getting involved in foundation seed production when it is unable to produce enough breeder seed. Production of certified seed (and the bulk of foundation seed) is primarily in the domain of the private sector on individual farms and through contract seed growers.

The public research has developed and released a number of varieties to the farming community during the period 1960-2002 (Table 8). These include: maize (7), beans (8), groundnuts (8), sorghum (4), finger millet (5), soybean (6), sesame (2), sunflower (1), rice (4), wheat (3), pearl millet (1), pigeon peas (1), cassava (6), sweet potatoes (7), Irish potatoes (5), and bananas (3). In 1999 NARO had a significant breakthrough by releasing the first local maize hybrids, Longe 2H and 3H, with yields of 7-9 tons/ha. These are single crosses whose seed production process is rather expensive. A good three-way cross (Hybrid D) had to be withdrawn because of seed production problems caused by poor nicking. Two promising three-way crosses are in the pipeline to replace it.

**Table 7. Uganda Crop Research Institutes and Their Mandates**

Institute	Mandate Crops
Namulonge Agricultural and Animal Production Institute (NAARI)	Maize, rice, beans, sweet potatoes, cassava
Kalengyere (under NAARI)	Wheat, rice, Irish potatoes
Serere Agricultural and Animal Production Research Institute (SAARI)	Small grain legumes, sorghum, millet, oil and fiber crops
Kawanda Agricultural Research Institute (KARI)	Horticulture, bananas, (post-harvest handling issues and soil science)
Coffee Research Centre (COREC)	Coffee, cocoa, oil palm

**Table 8. List of Crop Varieties Released by the Public Sector**

Crop	Varieties Released	Date Released
Maize	White star, Western Queen, KWCA, L1, L2H, L3H, L4	1960, 1960, 1971, 1991, 1999, 1999, 2000
Beans	Banja 2, K20, K131, K132, NABE 1-2, NABE 3, NABE 4-6, NABE 7C-10C	1968, 1970, 1994, 1994, 1995, 1996, 1999, 1999
Groundnuts	Manipinter, Bukene, Red Beauty, Roxo, Tatu 386, Mt. Makulu Red, Igola 1, Serenut 1-2	1968, 1968, 1968, 1969, 1969, 1971, 1996, 1999
Sorghum	Serena, Seredo, Sekedo, Epurpur	1966, 1980, 1995, 1995
Finger millet	Engenyi, Gulu E, Serere 1, Pese 1, Seremi 1-3	1969, 1970, 1970, 1989, 1999
Soybean	Bukalasa 4, S38, Congo 72, Kabanyolo 1, Nam I-II, Namsoy 3	1967, 1968, 1969, 1971, 1989, 1994, 2000
Sesame	S, Serra, Sesim I	1974, 1977, 2000
Sunflower	New Sunfola	1991
Rice	Abilony, UK 2, NP 3, NP 2	1995
Wheat	Kenya Chiruku, Pasa, Nkungu	1995
Pearl millet	Serere 1-2	1969, 1982
Pigeon peas	SEPI 1-2	1999
Cassava	Bukalasa 11, Embwanatereka, BOA, NASE 1-3, NASE 4-9, NASE 10-11	1970, 1970, 1970, 1994, 1999, 2000
Sweet potatoes	Wagabolie, Tanzania, Bwanjule Tororo 3, Sowola, New Kawogo, NASPOT 1-6	1995, 1995, 1995, 1995, 1995, 1995, 1999,
Irish potatoes	Malirahinda, Victoria, Kisoro, Kabale, NAKPOT 1-3	1974, 1991, 1991, 1991, 1999
Bananas	Kabana 1H-2H, Kabana 3H-4H, Kabana 5	1999, 2000, 2000

Source: NSCS (Personal Communication).

Tissue culture activities exist at KARI for the primary seed multiplication of coffee and bananas. Breeder seed of vegetatively propagated crops is used for developing mother gardens and nurseries. There is not much commercial interest in the multiplication and distribution of planting materials for these crops, except for coffee and to a lesser extent fruit trees.

**National Seed Certification Service**—The NSCS, previously a component of USP, is now an autonomous body under MAAIF, charged with an overall regulatory responsibility for the seed industry. These include licensing of seed dealers, field crop inspection, sampling and laboratory testing, official certification, and sealing of seed bags. It is also responsible for testing varieties for their distinctness, uniformity and stability and their value for cultivation and use. It works as the secretariat for the

VRC. As part of its overall responsibility for seed quality assurance, the NSCS develops rules and regulations for the entire seed industry and monitors to ensure compliance.

**Uganda Seed Project (USP)**—Following liberalization, the USP had to operate commercially and compete with emerging private companies. As such USP shifted the bulk of its production of registered and certified seed to contract seed growers in the Masindi and Kasese areas. Through training and provision of both capital and operating loans, the contract seed growers have grown into an important part of the seed chain in Uganda. Even the emerging private seed companies are using some of this pool of experienced farmers to produce their seed. The growers are organized into associations called the Masindi Seed and Grain Growers' Association (MSGGA)

and Kasese Seed and Grain Growers' Association (KSGGA), respectively.

At the same time, seed distribution through the district agricultural offices was abandoned, and seed sales agents were recruited and trained countrywide. With price differentiation, the network later evolved into a two-tier structure with distributors (wholesalers) and stockists (retailers) of agri-inputs. This led to an increase in direct cash sales by USP. The network has expanded with the support of the IDEA project and SG 2000 through the provision of training and development of training materials, setting up of demonstrations, and the provision of credit guarantees. The IDEA project also links the agro-input distributors with suppliers/producers and financial institutions both in Uganda and abroad.

The USP has now been converted into a limited liability company, Uganda Seeds Ltd., and is being prepared for privatization. The USP has therefore played an important role in the development of the seed industry although the slow process of its privatization is having adverse effects on the company and the industry as a whole.

### **Private Sector Seed Companies**

Taking advantage of the liberalization policy, there has been an increase in private sector investment in the seed industry, with both local and foreign seed companies entering the market. They are registered with and supervised by the NSCS. Vegetable seeds on the market are imported from various sources notably Kenya, Denmark, Holland, India, Zimbabwe, and South Africa. There is no restriction on the importation of vegetable seed. There are seven large private seed companies operating in Uganda today. These are: Farm Inputs Care Centre, Harvest Farm Seeds, Nalweyo Seed Co., OTIS-Garden seeds, Kenya Seed Co., General and Allied Ltd., and East African Seed Company. In addition to these locally incorporated companies, Seed Co. International and Pannar Seed Company have had their maize hybrids tested and adopted in Uganda. More maize and other crop varieties (sunflower and beans) are being tested. Seed Co. International has started local seed production of its flagship maize hybrid SC627, and if all goes well, the company intends to produce most of its seed requirements for East Africa in Uganda.

**Farm Inputs Care Centre**—Located in Kampala, FICA has production and storage facilities in Fort Portal, Masindi, and Kasese. The company started seed production in 2000 and marketing in 2001 and is now installing a modern seed-processing plant. Prior to that, its

parent company (AFRO-KAI Ltd.) was selling USP seeds primarily to relief agencies within and outside Uganda. Now it is handling NARO varieties including maize hybrids and OPVs, oilseed crops, millet, sorghum, and rice. FICA is currently producing its own foundation seed and has a seed distribution network countrywide.

**Harvest Farm Seeds**—HFS became operational in January 2000. It has processing and storage facilities in Kampala. HFS has the local franchise for marketing hybrid maize seeds from Seed Company International but also handles some of the NARO OPVs and other varieties, commercial seeds, and imports assorted vegetable and pasture seeds. The company has an arrangement with Nalweyo Seed Company (NASECO) to supply its contract growers with foundation seed and has a seed distribution network.

**Nalweyo Seed Company (NASECO)**—Located in Hoima district in western Uganda, NASECO was registered in 1996. It began as an NGO supported by the Catholic Diocese of Hoima with funding from the Belgian Survival Funds Project, but later converted into a company following liberalization of the industry. It is housed on a 120 ha farm with limited drying, processing, and storage facilities and has about 200 contract growers. The focus of the company is presently on the production and supply of foundation seed to some of the seed companies, and it has embarked on a program of variety development. SG 2000 has introduced Quality Protein Maize, officially called "Longe 5" but popularly known as "Nalongo" with NASECO carrying out the production of certified seed.

**OTIS-Garden Seeds**—Relatively new, this company was registered in 2002 and is located in Lira district. It is involved in the production and supply of improved seed and agricultural inputs. It also provides agribusiness consultancy and training.

**Kenya Seed Co.**—This company was locally incorporated in Uganda in 2000 but had originally been selling its seed through local companies. It is licensed to import maize hybrids that are particularly suited for the highland areas of eastern Uganda; namely Mbale and Kapchorwa. The company sells about 400 tons of maize seed per year and also imports an assortment of vegetable seeds.

**General and Allied Ltd.**—This company started business in 1996 and has grown into a large vegetable seed importer. Initially the company sold 700 kg of seed but today sells 3-4 tons of vegetable and grain seeds. It im-

ports vegetable seeds in bulk and repacks them in smaller containers suitable for the small-scale farmers under its own brand name of “**Afri-Seeds.**” It also acts as a distributor of other seed types for the other companies.

**East African Seed Company (EASCo)**—EASCo was registered in 2000. Between 85% and 90% of the seeds handled by the company are imported and processed. It is a major importer of vegetable seeds and has exclusive marketing arrangements for PANNAR hybrid maize seeds. Its parent company is headquartered in Nairobi, Kenya, where it has large-scale seed production facilities.

**Distribution and Marketing Network**—In 1995 the first seed agents were formally recruited, trained, and registered by the USP. Plans were for this network to expand into a countrywide distribution system of seeds, fertilizers, and pesticides. Subsequent support to the system was provided by the IDEA Project and SG 2000 leading to a network of stockists serving all the seed companies and other input suppliers. By 2000 there were about 10 distributors and 300 stockists registered in 39 districts handling a range of agro-inputs.

### **Informal Seed Sector**

It is estimated that 90%-95% of seed and other planting materials (bananas, cassava, and other root crops) in use by the farming community in Uganda are saved by farmers or otherwise obtained from informal sources. For vegetatively propagated crops the informal sector is the sole source of planting materials, while for maize seed, it may account for 50%-60% of the requirement with the rest coming from the formal sector. The informal sector is farmer based, with a lot of participation from CBOs and NGOs. There is no official supervision by the NSCS in this sector.

NGOs and CBOs are involved in the promotion of agricultural and rural development and in enhancement of community and household food security. They also play a big role in marginal production areas. They participate through provision of seed and production technology, training in seed multiplication and business skills, and in technology transfer through demonstrations. Sometimes these organizations obtain seed from the formal sector and thereby help in stimulating demand for seed. However, at other times they interfere in the development of the private sector because they distribute free inputs and thereby create a dependency syndrome among farmers or encourage low input unsustainable agriculture. The NGOs include World Vision International, Care International, Africare, Oxfam, Actionaid, Technoserve, etc. It will be desirable to make their work market friendly.

The International Institute for Tropical Agriculture and International Potato Center are also involved in informal seed production for the bean and sweet potato, respectively, while the International Maize and Wheat Improvement Center is conducting on-farm trials in marginal maize-growing areas of Kenya and Uganda with a view to encouraging informal uptake and seed production of the varieties selected by farmers. These international agriculture research centers have therefore gone beyond their traditional role of research and are involved in seed production and supply perhaps because there is no active private sector there. However, there is a need to assess this role to ensure that these programs do not jeopardize the development of AIMs. The Post-Harvest program at KARI is undertaking studies aimed at improving the quality of home-saved seeds.

### **Seed Sector Associations**

**The Uganda Seed Trade Association (USTA)**—USTA was incorporated on August 26, 1999, to unite its members and strengthen linkages among various stakeholders involved in seed-related activities in Uganda. Its main role is to act as the voice of the seed industry. The association is small and needs to increase its membership, which potentially includes not only local seed producers and distributors but also foreign seed companies, government institutions involved in variety development and seed certification, other agri-input dealers, and service providers. USTA is a member of the African Seed Trade Association, which enables it to access international fora and other multinational industry organizations and meetings.

The association can play an important role in the creation of awareness and sensitization of stockists, distributors and farmers, dissemination of information to stakeholders, liaison with NARO, government departments and seed regulatory bodies in policy development and implementation, and generally in promoting the use of improved seed. USTA should monitor and assess progress in the industry and, in collaboration with ECAPAPA, spearhead the process of harmonization of seed issues in Eastern Africa for the benefit of its members.

**Uganda Oilseed Producers and Processors' Association (UOSPA)**—UOSPA is an association of millers and farmers involved in the production and processing of oilseeds (sunflower, soybeans, and groundnuts), operating in Northern and Eastern Uganda. Established in 1995, UOSPA has played a key role in catering to the interests of those involved in the edible oil industry by reviving mills and the production of edible oil. Breeder seed

is obtained from SAARI and Namulonge Agricultural and Animal Production Research Institute, while UOSPA has initiated its own commercial seed production program through the use of contract growers. Seed distribution is through contract farmers at the village level who become stockists. They work in collaboration with Appropriate Technology-Uganda (AT-Uganda), the Vegetable Oil Development Program and Uganda Cooperative Alliance.

**Uganda National Seed Potato Producers' Association (UNSPPA)**—UNSPPA is an association of selected seed potato growers based in Kabale district, Southwestern Uganda. It was established in 1995 with the aim of enhancing the quality and quantity of seed potato in the country. They have put in place a sustainable and cheap seed potato distribution network at the community level. Production is estimated at 60 tons annually. Breeder/foundation seed is obtained from Kalengyere Research station to produce certified seed. NARO scientists monitor crop performance, seed storage, and handling.

**Seed Growers' Associations**—There are a number of *ad hoc* farmer groups producing seeds for the companies on contract, but the only legally registered ones are MSGGA and KSGGA with membership of 100 and 500 growers, respectively.

MSGGA has been planting an average of 1,000 ha per season of mainly maize (main crop), groundnuts, sorghum, sunflower, and soybeans, while KSGGA produces about 1,000 tons of beans and soybeans annually depending on demand. The associations were formed to facilitate access to credit and agricultural inputs, training in seed production, setting of seed prices, and marketing of seed/grain.

These associations currently face several problems including high cost of finance, high cost of production and inputs, poor harvest-handling facilities, insufficient drying and storage facilities, and underdeveloped output markets.

**Vegetatively Propagated Crops**—There is no official organization for the multiplication, marketing, and distribution of planting materials of banana, cassava, and sweet potato. NARO breeders have attempted to multiply and distribute planting material of new varieties of these vegetatively propagated crops through mother gardens. Due to limited institutional capacity they are multiplied and distributed at a few sites. Commercial private nurseries produce coffee seedlings of improved clonal materials and seedlings of fruit trees. The Tissue Culture laboratory at KARI is so far only used to produce small

quantities of banana plantlets, while a private entrepreneur recently opened such a laboratory in Bugolobi, Kampala. Tissue culture technology has the potential for very rapid multiplication of disease-free planting materials for vegetatively propagated crops.

### **Market Potential and Size**

The seed market in Uganda is potentially large not only because of the acreage grown for each crop but also because of the diversity of crops grown. On one hand, the diversity of crops may be an advantage to the industry players because it offers wide latitude for companies to specialize in a particular group of crops with similar seed handling requirements. On the other hand, such diversity may be a disadvantage because such a group of similar crops may not offer a large enough market for profitable investments. Yet for a single company to handle seed of different crop groups would require more investment capital in terms of facilities and human resources. Also, such crops may be growing in different agroecological zones, and this poses challenges in planning and coordination.

Table 9 shows the potential seed market for grain crops, excluding vegetatively propagated crops. From this table it can be seen that total seed demand is estimated at over 30,000 tons for grain crops. But Figure 4 shows that combined formal sector seed sales reached a peak of just under 5,000 tons in 2000. This means that there is still a huge task to fully satisfy the seed market in Uganda although there has been a steady rise in the sale of certified seed since 1997. This rise can be attributed to the positive policies that have enabled all stakeholders to participate in the industry.

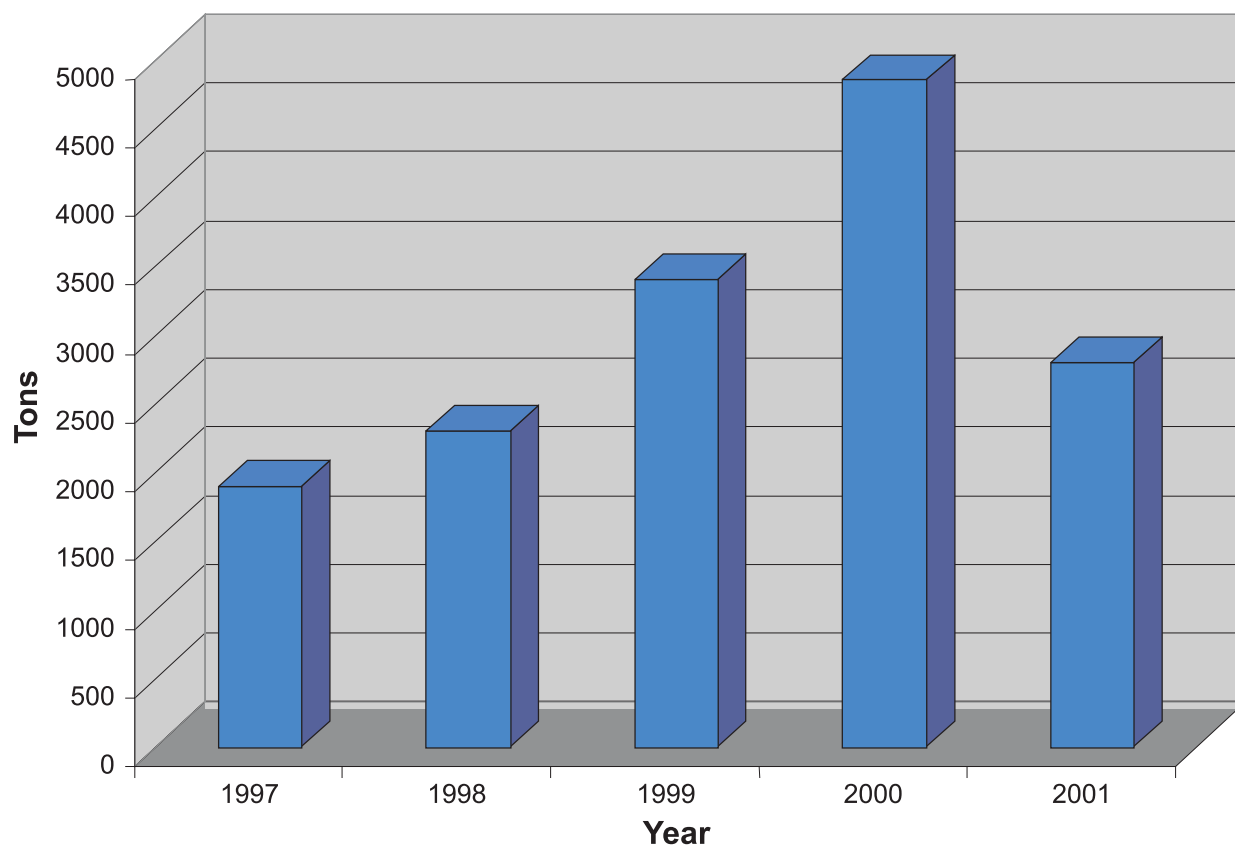
In 2001 sales were affected by the commodity market crash with poor produce prices substantially affecting the sale of inputs. As a result, a reduction in the demand of all seed types was experienced with farmers reverting to the use of home-saved seeds. Seed companies realized only about 20% of their expected sales turnover. Cash flows along the entire seed chain and farmer income were affected; several commercial farmers struggled to repay bank loans.

Because of this price collapse, the Uganda Grain Traders (UGT), a consortium of 16 private produce dealers, was formed in 2001. UGT has so far executed a supply contract of 30,000 tons of maize grain to Zambia. This action has raised grain prices and offers hope to farmers. The monthly price trend for maize grain over several years reveals that the price is already rising out of the all-time

**Table 9. Estimated Seed Market Size Based on Area Planted**

Crop	Seed Requirement
	(mt)
Bean	10,000
Maize	7,500
Finger millet	3,000
Groundnut	3,000
Rice	2,000
Sunflower	2,000
Sorghum	1,500
Sesame	1,500
Soybean	950
Cowpea	300
Other pulses	200
Pasture/vegetables	50
<b>Total</b>	<b>32,000</b>

Source: MAAIF/IDEA Project.



**Figure 4. Seed Sales in Uganda, 1997-2001**

trough, and it is hoped that the seed sales will improve accordingly (Figure 5).

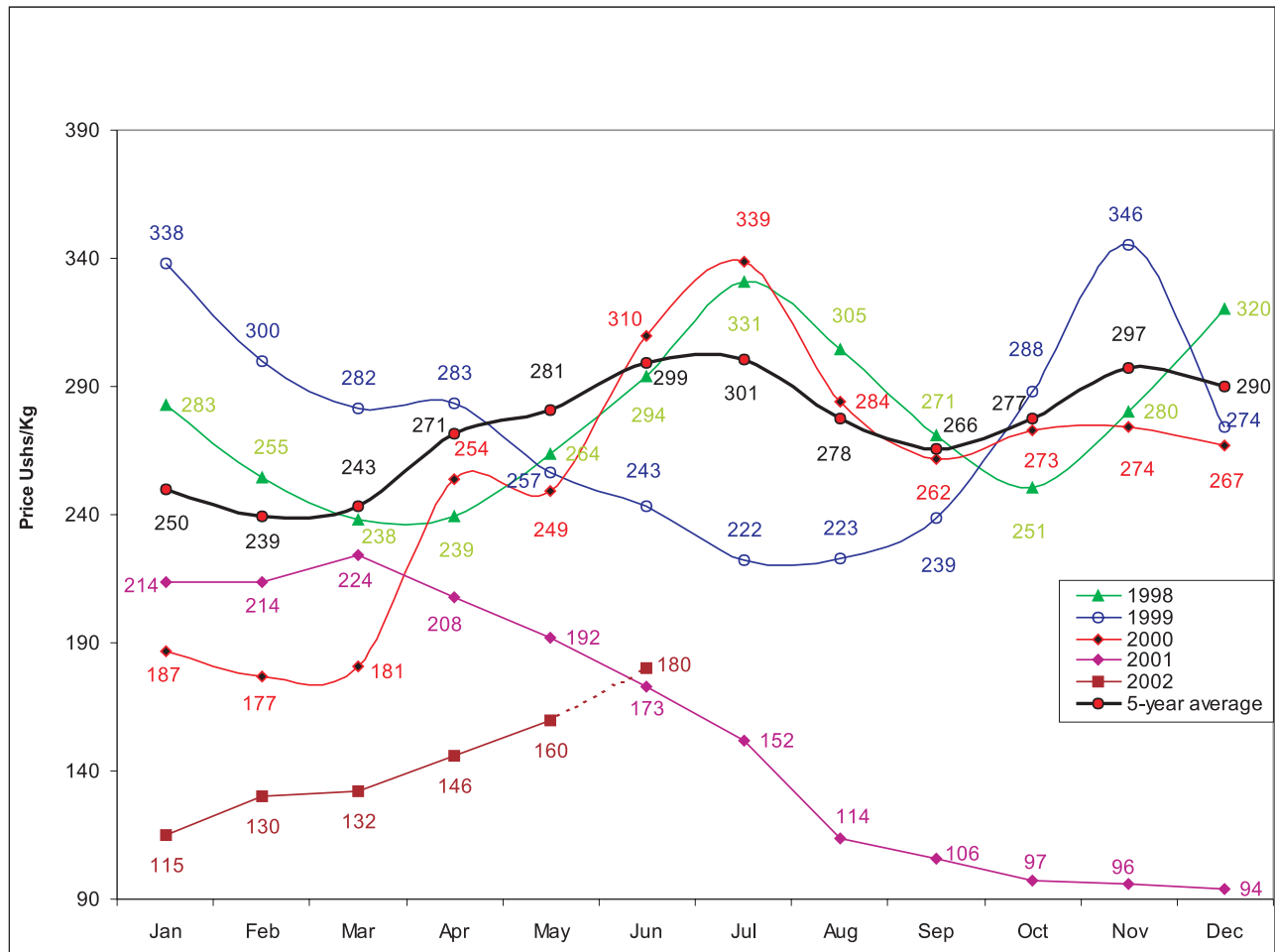
**Regional Market Integration**—The East African region has embarked on the process of harmonization of seed policies, laws, regulations, and procedures following studies conducted by the Eastern and Central Africa Programme for Agricultural Policy Analysis (ECAPAPA)/ Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA).<sup>11</sup> This is expected to create a larger seed market that can attract substantial investment from both local and international companies. Initially the exercise involved the three member countries of the East African Community (EAC), namely, Kenya, Uganda, and Tanzania, but the exercise is to be expanded to include Rwanda, Burundi, the Democratic

<sup>11</sup>ECAPAPA is a donor-funded program of ASARECA.

Republic of Congo, Eritrea, Ethiopia, Madagascar, and Sudan.

The ECAPAPA’s seed policy harmonization program has yielded the following:

- Variety performance trials for new varieties have been reduced from three seasons to one main growing season if adequate performance data from other countries are available.
- The number, membership (private sector included), functions, and frequency of meetings of the VRC have been rationalized and harmonized to speed the release of varieties. The idea is to ensure that VRCs in the three countries conduct business in the same manner so that a variety released in one country is duly recognized in the other two countries. The long-term vision



Source: ADC/IDEA Project.

**Figure 5. Trend for Maize Wholesale Prices in Kampala, 1998-2002**

is to have an East African VRC although there is little consensus about it at this time.

- A regional seed catalog is being established to provide increased availability of information on seeds/planting materials in the region.
- Private seed companies/breeders can now undertake their own performance evaluation trials with government supervision, which saves time and increases efficiency.
- Phytosanitary restrictions on the 10 most important crops were reduced from 33 to 3, and all countries accepted the use of the revised pest risk analysis procedures. A common list of mid-high risk quarantine pests has been established and will be regularly reviewed (Table 10).
- Export documents and procedures have been rationalized in the region.
- Crops under compulsory and voluntary certification were agreed upon—this would hasten seed movement.
- Laboratory standards for the main crops are harmonized.
- Seed classes were harmonized to four, and common seed tags were agreed upon.
- Public and private institutions, including seed companies, can now undertake seed certification.
- An interagency certification scheme was adopted.

### Constraints Affecting the Performance of the Seed Market

Despite the existence of the seed industry for about 30 years, modest progress has been made in the last decade only. Before that, political, civil, and economic turmoil curtailed any development. Even with the current impressive developments, much more could be achieved if the constraints affecting the industry could be addressed. These include the following:

**Lack of National Seed Policy**—There is no written national seed policy to guide further development of the seed industry, which often confuses stakeholders and frustrates potential investment in the sector. This is complicated by delays in implementing announced government policies and programs, for example, privatization of USP, formalization of seed regulations, and constitution of the NSB.

**Lack of Plant Breeder’s Rights**—The Plant Variety Protection Bill of 1999 exists in draft form. Absence of this protection constrains foreign investment in the seed sector and retards private sector participation in research and variety development.

**Limited Supply and Access to Breeder and Foundation Seed**—Limited supply and access to breeder and foundation seed has been the chief constraint to seed production. Breeder seed is provided free to USP; yet production is costly and time consuming and therefore not sustainable. Private seed companies have not had access to the same although the situation has changed recently. The main constraint to sufficient breeder seed production has been inadequate funding for NARO, which af-

**Table 10. Justification of Preliminary Mid-High Risk Quarantine Pests List for East Africa**

<b>Maize</b>	<b>Reason</b>
Mycosphaerella zea/maydis	Present only in Kenya
<b>Wheat</b>	
Xanthomonas translucen pv. translucen	Present in Kenya and Tanzania
<b>Cassava</b>	
African Cassava common mosaic virus	Localized

Source: ASARECA/ECAPAPA (Personal Communication).

fects the operations of the breeding program, the release of varieties, and availability of breeder seed.

**Poor Output Market Development**—The demand for seeds is correlated with the demand for farmers' produce. The farm input markets are suffering from the low commodity prices experienced last year. As happened in 2001, farmers abandoned the use of improved seeds because of the absence of marketing outlets for their produce. Poor post-harvest handling techniques by the farmers also affect the quality of the produce and, therefore, the market value. Post harvest losses in Uganda are estimated at 20%-40% for grains, 20%-25% for root crops, and over 40% for perishables (MAAIF and MFPED, 2000).

**Weak Regulatory Services**—The NSCS is limited in capacity following restructuring of MAAIF with a team of only six inspectors; yet their activities are country-wide. Poor facilities and untimely release of funds hamper planned activities. Inspection is therefore weak along all levels of the seed chain and subject to abuse in the areas of truth-in-labeling and quality control. The NSCS is also unable to enforce the quality of vegetatively propagated crops and that of the imported vegetable seeds.

**Lack of Access to Affordable Credit Facilities**—Lack of access to affordable credit facilities by the seed companies, seed growers, stockists, and farmers reduces operational capacity and hampers capital development. Interest rates of up to 24% charged by the banks are prohibitive. In any case most banks regard agriculture as high-risk business and non-bankable.

**Limited Infrastructure**—Limited infrastructure, e.g. processing, storage, and internal quality control facilities of some of the seed companies, and limited technical know-how in all the companies.

**Lack of Capital for Business Development in Rural Areas**—Although the dealership network exists, it is mainly concentrated in urban and peri-urban areas because of financial constraints, low seed demand, and high transport costs. Thus, farmers in the rural areas either do not have access to improved seeds or must travel long distances to buy them. Stockists also do not stock sufficient quantities due to limited finances and storage facilities.

### **The CPP Market: Structure, Functioning, and Constraints**

No nationwide data exist that quantify the overall incidence of pests and diseases on crop production in

Uganda. However, *ad hoc* and site-specific measurements indicate that crop production losses due to pests and diseases are economically significant. Consequently, improving factor productivity to ensure food security and eradicate poverty should involve not only a greater adoption of modern technologies such as quality seed of high-yielding varieties and mineral fertilizers but also minimizing losses due to pests and diseases both on farm and off farm.

As a policy, MAAIF supports the integrated pest management (IPM) strategy for controlling pests and diseases. It involves technical packages consisting of a judicious use of chemicals combined with the use of pest- and disease-resistant crop varieties, clean seeds, and appropriate crop management practices such as crop rotation, intercropping, and soil nutrient management. However, the use of CPPs is recommended only when it cannot be avoided (GOU, 1993).

The national policy notwithstanding, pests and disease management in Uganda's agriculture has always been and continues to be predominantly based on chemical control, particularly in the commercial sector where much of the CPPs are used. Chemicals are used not only in crop production and storage but also in livestock husbandry and public health. In recent years, there has been an increased awareness about the possibility and benefits of biological control. Despite the appeal of and the progress being made by research on biological control, more trials are still needed to identify the appropriate parasitoids and minimize the uncertainty regarding the likelihood of harmful side effects. More research is also needed to minimize the uncertainty regarding the likelihood of insect and weed resistance in the long run.

### **Market Structure and Functioning**

Until 1997 the GOU heavily subsidized the importation and distribution of CPPs. The role of the private sector was limited to facilitating product importation through an international tender system for distribution by the public sector, cooperative societies, and parastatals. Now, with the exception of donations for emergency campaigns to face migratory and perennial pest outbreaks, the private sector imports most of the CPPs used in Uganda. Imports under the Japanese Grant KR-II were suspended in 1997. However, while there is some suspicion among importers and distributors about the resurgence of KR-II supplies, this does not seem to have created an uncertainty to the extent of influencing their market planning and strategies. Though the GOU has confirmed having no plan to bring in KR-II products, a clear ministry policy

statement in this regard is needed to quell the rumor. Such a policy should include a clear government commitment to integrate these products with commercial imports through a transparent and market-friendly auctioning process should there be more KR-II imports.

The commercial private sector competes for about 70%-80% of the CPP market. About 10%-15% of the CPPs imported in Uganda is direct importation by end-users in the estate sector, particularly the sugarcane, flower, horticulture, cotton, tobacco, tea, and coffee estates. Another 2%-3% is direct importation by the public sector (ministries, medical, and laboratory services), and individual importers account for the rest.

Unlike its neighbor Kenya, Uganda has no pesticide production, formulation, or repackaging facility. The country sources its supplies of CPPs through direct bulk importation of ready-to-use formulations from many countries in Europe, Africa, Asia, and North and South America. The only data available are imports recorded by the Uganda Revenue Authority (URA). The URA data show that, all products combined, Europe has been the most important source of CPP, accounting for about 40% of the total import value in nominal terms between 1997 and 2001. Other regions from which CPPs are sourced are East Africa (26%), Asia (16%), Southern Africa (13%), Middle East (3%), South and North America (1%), and other African Regions (1%). This same pattern fairly well applies at the product-type level. Imports sourced from East Africa are mostly from Kenya (99% of total

import value between 1997 and 2001), and imports sourced from Southern Africa are primarily from South Africa (79%) and Zimbabwe (20%).

On a country-by-country basis, the 10 most important sources of CPPs during the 1997 and 2001 period have been Kenya (about 25% of the total value of imports), the United Kingdom (15%), South Africa (10%), India (9%), Belgium (6%), Italy (5%), Germany (5%), France (4%), Zimbabwe (3%), and Japan and China (2% each). Clearly, suppliers from Kenya are indirectly the main players in the Uganda CPP market. Insecticides account for about 72% of the total value of CPPs imported from Kenya between 1997 and 2001. Fungicides account for 15%, herbicides 5%, disinfectants 4%, and rodenticides 1%. The importance of CPP supplies from Kenya has been mainly because many of the multinationals represented in Uganda have affiliates with formulation capacity in Kenya. Improving the linkages and information flow between these two markets would therefore be beneficial for Uganda.

#### **Small Market Size Dominated by Insecticides—**

Over the years the quantities of CPPs imported in Uganda have steadily increased, and new products are continuously introduced in the market. The current market size for CPPs is almost three times its 1990 level in nominal monetary terms. Based on URA data, between 1997 and 2001, imports of insecticides, fungicides, and herbicides (including anti-sprouting products and plant growth regu-

**Table 11. Value of Pesticide Imports in Uganda, 1997-2001**

Product Type	Import Value <sup>a</sup> (million US\$)					Average 1997-2001
	1997	1998	1999	2000	2001	
Insecticides	4,144	11,048	7,899	10,146	9,577	8,562
Fungicides	1,200	2,555	1,702	2,696	5,037	2,638
Herbicides <sup>b</sup>	1,834	2,887	2,644	2,384	3,585	2,667
<b>Subtotal</b>	<b>7,178</b>	<b>16,490</b>	<b>12,245</b>	<b>15,226</b>	<b>18,199</b>	<b>13,867</b>
Rodenticides	289	383	42	70	362	229
Disinfectants	278	239	1,405	168	338	486
<b>Subtotal</b>	<b>567</b>	<b>622</b>	<b>1,447</b>	<b>238</b>	<b>700</b>	<b>715</b>
<b>Grand Total</b>	<b>7,745</b>	<b>17,112</b>	<b>13,692</b>	<b>15,464</b>	<b>18,899</b>	<b>14,582</b>

a. Value of the imports reported to URA, not including import duties and taxes.

b. Includes anti-sprouting products and plant growth regulators.

Source: Estimated using URA data.

lators) averaged about US\$ 13.9 billion annually (Table 11). This is roughly equivalent to US \$7.8 million and includes veterinary products (about 13%). Rodenticides and disinfectants add another US\$ 715 million, which is equivalent to US \$400,000. Although the import value is not necessarily equivalent to the market size due to the likelihood of carryover inventory, these data suggest nevertheless that the Uganda CPP market is relatively small, particularly when compared with that of its neighbor Kenya. Given that only about 5%-10% of smallholder farmers use CPPs in Uganda, greater adoption of CPPs by this group will substantially increase the market size.<sup>12</sup>

Between 1997 and 2001 insecticides have been the predominantly used CPP in Ugandan agriculture. During that period, insecticide imports alone have averaged about 62% of the total insecticides-fungicides-herbicides imports against 19% for fungicides and 19% for herbicides. The import shares of these CPPs have varied over the years with that of insecticides ranging between 53% and 67% of the total insecticides-fungicides-herbicides market, against 14%-28% for fungicides and 15%-26% for herbicides.

**Diversified Product Mix**—More than 250 different CPPs are used in Uganda. These products represent a broad spectrum, which is consistent with the agricultural chemicals regulations (GOU, 1993). More products are used in the country than are registered with the ACB as reported in *The Uganda Gazette* (GOU, 1998; 2000; and 2001). However, the number of active ingredients is far less than the number of products because for some of these products different importers offer the same active ingredients under different generic brand names.<sup>13</sup> An examination of the pesticide products commercialized in Uganda shows that most of these products represent a broad spectrum. This is consistent with the agricultural chemicals regulations (GOU, 1993), that call for recommendations aimed at controlling specific pests on all host crops rather than for use on specific crops except for phytosanitary and residue consideration.

<sup>12</sup>Although this estimate is commonly quoted in the country, it was generated many years ago. Nevertheless, it is generally admitted that it provides a good qualitative indication of the limited use among this group of farmers. However, there is a need for a comprehensive survey to estimate the level of use of CPPs among smallholder farmers and the impact of pests and diseases on agricultural production in Uganda.

<sup>13</sup>For example, during field visits, the team identified at least 13 cypermethrin-based insecticides, 12 mancozeb-based fungicides, and 11 glyphosate-based herbicides.

**Predominant Use by the Estate Sector**—A large proportion of the CPPs sold in Uganda is purchased by estates and large-scale farmers. Only 5%-10% of the country's smallholder farmers use pesticides in farming. Pesticides are not used in the production of food crops such as beans, maize, banana, millet, sorghum and cassava. The flower industry in Uganda is one of the heaviest users of pesticides. Twenty flower farms use more than 100 different types of chemicals to control flower pests. The cotton estates (140,000 ha) use primarily insecticides while the sugarcane (45,000 ha) and tea (30,000 ha) estates chiefly use herbicides. The flower (65,000 ha) and coffee (1.6 million ha) estates use mostly fungicides and insecticides. The tobacco estates use primarily insecticides. The use of CPPs in vegetable (200,000 ha), flower, and horticulture production is increasing largely as a result of the expansion in area cultivated.

The use disparity between estates and smallholder farmers can be explained by not only a long history of government effort to promote CPP application on export crops but also the higher market value of estate crops and a higher level of education, sophistication and capitalization of its farmers. Clearly, the smallholder sub-sector offers the largest growth area in the Uganda CPP market. However, it is also the most challenging one to develop and service. To service smallholder farmers, private operators face higher transaction costs associated with product market development in a client population with a low literacy level, dispersed across a wider geographical area and linked by a poor rural road infrastructure. Furthermore, smallholder farmers grow low-value crops (lower profitability) and have limited purchasing power. Recognizing that CPP sale and use is very knowledge intensive and health sensitive, the government's challenge is to ensure proper education of and safe use by farmers and the general public.

**A Low Use of Veterinary Products and Services**—Livestock production contributes about 16% to 20% of total agricultural GDP. The bulk of this production (about 95% of the cattle and 100% of the small ruminants) is attributed to smallholder farmers operating mixed crops and livestock. The sector suffers from high prevalence of the main animal diseases such as ticks and tick-borne diseases, rabies, and African swine fever, which are also addressed under the PMA. However, the level of adoption of veterinary products and services remains low (Table 12). Increasing the use of these products and services is critical to household food security because culturally and financially most of the population depends on livestock (particularly large ruminants) for their protein intake.

**Table 12. Adoption of Veterinary Products and Services**

	% Households Using			
	Central (n=70)	East (n=122)	North (n=67)	West (n=72)
Medicines	70.0	40.9	70.1	56.9
Vaccines	14.3	25.4	22.4	11.1
Artificial insemination	2.9	2.5	0.0	0.0
Veterinary service	30.0	36.9	25.4	44.4
Bull service	8.6	7.4	4.5	0.0

Source: IFPRI household survey.

### Main Players in the CPP Market

**Importers**—The importation of CPPs into Uganda is done both through the formal and informal sectors. The formal sector is one in which products go through the formal registration and importation processes and participants include registered private commercial importers, end-user importers, individuals, and the public sector. The informal sector includes traders not duly registered to import CPPs but who smuggle in products in smaller quantities from neighboring countries.

**Private Commercial Importers**—These include both small and large importers based on the total value of their imports. Companies such as Rhone Poulenc Uganda, Tropical Investment Ltd., Balton, Twiga, Famous Distributors, Lipsun, Bukoola General Entreprises, Universal Chemicals Ltd., Safeguard International Distributors, and Quality Chemicals, and Magric have imported over one billion US\$ of CPP products in total in the last 5 years. General and Allied, Allied Chemicals Ltd., Sekalala Enterprises Ltd., and Dembe Trading Enterprise Ltd. have imported between US\$ 500 million and one billion US\$ of CPP products in total during the same time period. Private commercial importers tend to specialize in a few CPPs while also dealing in seeds and/or fertilizers with variable intensity. As a result, there is some sort of oligopolistic competition at the wholesale level with high margins reaching as much as 30%-35% as each firm strives to specialize in products where it can dominate the market. Most of these importers are closely affiliated with at least one multinational agrichemical company it represents. In general, such representation is not exclusive.

Some of the main registered private importers have East African affiliates of their parent company, particularly in Kenya. This gives them some added flexibility because they can reduce their turnover time by securing inputs from these sources in a shorter period of time. On one hand the link to an East African affiliate is important because the cost of capital in Uganda is high. On the other hand, that link tends to facilitate the development of import strategies based on orders, thereby limiting market development efforts into rural areas. Consequently, most importers tend not to sufficiently use their clients to generate market information or feedback on their products and competitors to develop dealer networks.

The large importers of CPPs in Uganda are usually wholesalers with activities limited to Kampala. Some are also retailers, but their financial interests in the retail input sector tend to be limited. Such wholesalers-retailers make it difficult for some retailers to compete when they operate in the same market as their client retailers.

Since 1991 the main registered private importers in Uganda have formed an association called the Uganda Agrochemical and Pesticides Association, but this association has not been active. If strengthened, such an association would be very beneficial because it could devise an effective self-monitoring mechanism to protect the industry participants, farmers, and consumers. Furthermore, it could offer technology demonstration and training opportunities to its members in partnership with the public sector, create a forum for interaction and exchange of information among enterprises, represent the

interests of the industry within the country, and create useful regional and international linkages.

**End-User Importers**—The end-user importers are mainly commercial large-scale farms or estates in sugarcane (Kinyara, Luzari, and Kakira), tea (Rwenzori Commodities and Rwenzori Highland), tobacco (British America Tobacco and Mastermind Tobacco Uganda Ltd.), flowers, and horticulture. They also include associations such as the Cotton Ginners Associations. Some of these end users import directly to ensure the timely availability of the products. They have accounted for about 4% to 11% of the total value of CPP imports annually between 1997 and 2001. Very often, however, the direct importation is limited when an end user tries to import from a manufacturer represented in the region. In such cases, the manufacturing company advises the client to purchase from its regional representative.

**The Public Sector**—The share of the public sector's direct importation in the total value CPPs recorded by URA has declined dramatically over the years from about 17% in 1997 to almost zero in 2001. The bulk of CPPs imported by the public sector consists of products used to control migratory and perennial pest outbreaks. Other uses include products destined to various laboratories and livestock production.

**Small Illegal Importer**—There are a number of individuals operating outside the formal sector and whose activities are not registered and taxed. They tend to deal in various commodities in response to short-term market opportunities, thereby taking advantage of short-term surpluses and shortages. While the market share of illegal products sold in Uganda is not known, they do not yet appear to be a significant constraint to market development.

### **Domestic Marketing**

The internal distribution system for CPPs includes both wholesale and retail activities. Both wholesalers and retailers are much more diversified than importers. They trade seasonal inputs (seed, fertilizer, and CPP), veterinary products, and agricultural equipment and machinery.

At the *wholesale level*, private operators are usually importers. Their activities are limited to urban areas. Very few wholesalers have an extensive distribution network of their own. They tend to use the distribution network established by the defunct AT-Uganda and the USP to minimize risks, overhead and storage costs, and training costs associated with developing their distribution network.

At the *retail level*, dealers tend to be sole proprietors with one or two employees. Typically, they finance their businesses with personal funds and use public transportation to obtain and move products. They rent small shops with limited storage space and poor ventilation. As a result, they carry limited inventory stock and very limited range of crop inputs due to not only lack of capital but also the low level of farmers' effective demand. This segment of the marketing chain experiences a high turnover because many retailers move away from CPPs to sell veterinary products. Some of the retailers and their premises are not duly registered. Since 1987 retailers of CPPs in Uganda have been organized in an association called the Uganda Chemicals and Pesticides Association (UCPA) for promoting CPP business, but the UCPA has not been active. The dealers have been encouraged to revamp the association that would provide a forum for the exchange of ideas and contact between them and MAAIF. It would also encourage more members to register themselves and their premises.

**Sales Arrangements and Marketing Margins**—Most importers and retailers operating in the Uganda CPP market have limited personal funds. Typically, importers buy from manufacturers on credit for up to 180 days. They supply products to both end users and retailers on the basis of contract or non-contract sales arrangements. Importers sell on a cash basis to retailers or on 30- to 60-days' credit for a few credit-worthy clients. They can also give discounts depending on the quantity purchased. Retailers sell primarily for cash but in a few cases they sell on a 30-day credit to credit-worthy farmers.

Prices vary from location to location but do not necessarily reflect transport or other distribution costs. Both at wholesale and retail levels, marketing margins vary depending on the seller, the product, and the product type. However, a few companies promote name brands and logos (e.g., Twiga, Balton, and East African Seed). Generally there is price competition at the retail level, but businesses make only a limited effort to market their products by strategically reaching out to farmers. A nonsystematic random sample of sellers suggests that wholesale margins vary between 8% and 22%, against 4%-27% for retail. Insecticides tend to have the highest margins, averaging about 18% (Table 13).

While margins on fungicides tend to be among the lowest, their turnover is higher. Further market investigations reveal that when a wholesaler has been able to capture a particular market segment, the corresponding margins tend to be raised reaching sometimes as high as 30%-35%.

**Table 13. Indicative Marketing Margins for Pesticides in Uganda, 2002**

	Wholesale Margins (% acquisition cost)		Retail Margins (% acquisition cost)	
	Range	Average	Range	Average
Insecticides	11-13	10	5-27	18
Fungicides	8	8	8-20	14
Herbicides	4-22	9	4-25	13
Overall	8-22	9	4-27	15

Source: Research Team Field Visits' Survey.

### Legislative and Regulatory Framework

**The Statute and Supporting Regulations**—“The Control of Agrochemicals Statute, 1989” and “The Agrochemicals (Registration and Control) Regulations, 1993” control the importation, local manufacturing, formulation, packaging, exportation, use, storage, or distribution of all agricultural chemicals in Uganda. Both the statute and the supporting regulations deal with fertilizers and pesticides. They focus on safety, efficacy, and suitability issues. Other statutes exist that complement these two regulatory instruments, namely, the statutes of the National Environmental Management Agency (NEMA), the Uganda National Bureau of Standards (UNBS), URA, and the National Drug Authority (NDA).

Key features of the statute and supporting regulations include a mandatory registration of products, importers, dealers (identified as fumigators and commercial applicators), and the premises. The regulations also provide for a full, temporary, and restricted product registration. Product registration involves assurance of product efficacy and degree of toxicity. Any person engaged in the manufacturing, formulation, packaging, usage, or storage of chemicals shall have adequate technical knowledge of chemistry toxicology, efficacy, safety and general use and wear appropriate protective clothing. Similarly, the premise used shall be equipped with first-aid facilities. Storage building requirements include a separate building not used by humans or animals.

Applications for registration of a company or firm, a product, or a premise are made to the ACB at a fee. To be registered a product has to be tested in country for a minimum of three growing seasons (6 months for animals) at a fee not exceeding USh 2,000,000, and approval is granted or denied within 6 months thereafter.

Violations of the statute and its supporting regulations are subject to penalties involving monetary fines and/or imprisonment. In addition, the court may suspend, cancel, or revoke a certificate of registration or license.

Registration of pesticides started in 1994, and the list of registered chemicals is published in the *Uganda Gazette*. By April 2001, there were 268 registered trademarks for regular and trial categories. The statute and the supporting regulations are widely acceptable to most participants with a caveat that the regulations apply for both fertilizers and pesticides, thereby creating some ambiguity at times. Furthermore, some statements are not precise. In response to these concerns, there is an ongoing effort aimed at amending the current regulations to address these concerns. The amendments focus on stiffer penalties, separation of regulations for fertilizers particularly truth-in-labeling, and inclusion of stakeholders (e.g., NEMA and NDA) who were not in existence when the regulations were implemented. Similarly, there is an effort to develop appropriate biosafety regulations by the National Council of Science and Technology (NCST).

**Institutional Arrangements**—Regulatory agencies include both statutory and non-statutory bodies. Statutory bodies are ACB, the Agricultural Chemical Technical Committee (ACTC), the Registrar, and the Secretariat and its inspectors. The ACB is responsible for policy formulation. It ensures due registration and use of chemicals, regulates their quality and importation, and advises the Minister of MAAIF accordingly. The ACTC advises the ACB on technicalities related to the statute and supporting regulations. The Registrar maintains separate registers for agricultural chemicals, fumigators, commercial applicators, and premises. The routine operation and

enforcement of the statute and supporting regulations are the responsibility of the Secretariat and its inspectors. Inspectors and analysts are appointed by the Minister of MAAIF. There are only five agrochemical inspectors. However, when available, the Secretariat can use another 22 inspectors from the phytosanitary and national seed certification services, and district-delegated staff for regulatory activities at the border points.

NEMA, NDA, UNBS, and URA are other relevant statutory regulatory agencies in their own capacity, but they operate under separate statutes. NEMA and NDA are responsible for environmental safety issues including disposal of condemned chemicals and drugs. UNBS is responsible for defining and checking compliance with standards and testing product residues on food products. In practice, however, the UNBS has not played its critical role. The chemist section at the URA is responsible for product inspection for quality, safety, and conformity with standard custom clearance. NEMA, NDA, and UNBS have fully delegated their inspection roles to the URA chemist. If the inspection is satisfactory, URA issues a bill of entry.

Non-statutory bodies include groups whose code of conduct deals with CPPs. These are particularly the Uganda Flower Exporters Association, the Uganda Horticulture Exporters Association, and the Uganda National Farmers Federation. Other supporting institutions include research and extension services, NGOs such as SG 2000, and projects (e.g., IDEA project). Research services from both NARO and the University impact CPP marketing in that they are responsible for testing product efficacy and degree of toxicity before they are registered. The Agricultural Extension Service of the MAAIF impacts on the CPP market through its mandate to provide training and information about new technologies to farmers.

### **Constraints Affecting the Performance of the CPP Market**

A key component for the development of a well-functioning CPP market in Uganda is the government's strong commitment to market liberalization and the modernization of the agricultural sector. However, despite strong government commitment, the Uganda CPP market remains thin and underdeveloped. This is because a number of significant constraints continue to hinder the effective development of an efficient CPP market in the country. These factors make input market development in rural areas a daunting task for wholesalers and retailers. They are exacerbated by the relatively low literacy and education rates of farmers operating on small-scale

production plots and dispersed over a wide geographical area, the poor rural road infrastructures and costly legal system for dispute resolution and contract enforcement. The following factors constrain the development of the pesticide market in Uganda.

**High Cost of Capital**—CPP marketing is capital-intensive, and most Ugandan operators are not able to raise the necessary funds from their own resources. Consequently, they usually must rely on credit institutions to secure the necessary funding. Only growers affiliated with estates or large-scale farms and importers connected to multinational companies benefit from seasonal credit for inputs. At all levels of the industry and particularly at the distribution level (retail and wholesale), access to credit is a primary constraint for most operators. Most commercial banks offer credit facilities with interest rates as high as 40%<sup>14</sup> and stringent collateral requirements. Such rates require much higher output prices than the current ones for the investment to be attractively profitable for both dealers and farmers.

The commercial banks make no difference between the general trade and marketing of agricultural inputs in setting the credit terms and requirements. Given the risk associated with marketing agricultural inputs, none of the commercial banks have attempted to develop a special program for agriculture. This situation is also partially fueled by their limited experience in dealing with agriculture and a culture of default and poor credit management. The immediate consequence of the limited access to affordable credit facilities is that in most cases retailers and farmers are compelled to pay cash for their inputs, and input orders are in small uneconomical sizes.

**Lack of Market Information**—As indicated earlier, there are no reliable data on the supply of pesticides in the country primarily because there is no single organization collecting and disseminating information about input marketing in Uganda. The only input data available are imports recorded by URA. Yet the URA data set includes only products formally coming into the country, and it is not recorded in a format that easily lends itself to market analysis due to the coding scheme that URA uses. As a result, it is difficult for wholesalers and retailers to develop a market plan and strategy that would take advantage of the shortages in different marketplaces

<sup>14</sup>However, official lending rates ranged between 17% and 21%. Some importers who have established good business rapport with commercial banks are able to obtain more favorable interest rates ranging between 9% and 15%.

in the country. Most importers, wholesalers, and retailers tend to buy and sell in order to keep a limited stock, if any. At the import level, information about the input market situation in the region and abroad is needed to improve market transparency. Such information would lead to more competitive prices. Similarly, a transparent input market at home would improve market planning and strategy for wholesalers and retailers and thereby add pressure for more competitive prices in the domestic market.

**Limited Business and Entrepreneurial Skills**—Even though most of them have been established for many years, CPP dealers in Uganda tend to operate in urban and peri-urban areas. This is in part because of limited capital, low effective demand in rural areas, lack of market information, and poor rural road infrastructure. An equally important reason for dealer concentration in urban and peri-urban areas is their limited business and entrepreneurial skills. Very few wholesalers and retailers are able to show evidence of good record keeping and market planning. The wholesalers sell to existing retailers who in a sense act as stock keepers for the former. Even among the main importers and wholesalers, there is very limited effort to develop their own distribution network to expand market opportunities. As a result, there is very little competition in rural areas. Competition can be increased with the emergence and development of well-trained dealers in rural areas. Such a development would lead to lower prices and increased farmers' product knowledge as more and more dealers get involved in promotional activities to develop their markets.

**Limited Effective Demand of Smallholder Farmers**—The use of CPPs is mostly concentrated on large-scale farms and estates. Only about 5%-10% of the smallholder farmers use CPPs in crop production in Uganda. For those using CPPs, their transactions are typically of very small size. The immediate consequence under such conditions is the small market size and ensuing high prices for CPPs. There are various factors determining the limited effective demand of smallholder farmers and thereby preventing them from reaching a critical mass necessary for profitable market development activities. The most important of these factors include the following.

- Unfavorable input/output price ratios that do not justify investment in costly technologies.
- Limited purchasing power and access to seasonal input credits. Most smallholder farmers in Uganda are poorly capitalized, and thereby have limited resources

to purchase inputs from their own savings. Currently, there exists very few credit facilities available to farmers. Those that are available (e.g., Centennial Rural Development Bank) tend to charge high interest rates.

- The low productivity of most smallholder crops, which discourages smallholder farmers' investment on high-priced CPPs.

**Inadequate Staffing and Funding for the Regulatory Agencies**—Though critical to the development of an efficient and safe CPP market, the regulatory services are poorly funded and inadequately staffed. The budgetary allocation to the Secretariat responsible for the day-to-day operation and enforcement of the statute and supporting regulations is inadequate and not released on time.

The funding constraint hinders not only effective operational requirements but also the analytical capacity. There are two commercial laboratories (UNBS and Chemifa) in Uganda accredited for and capable of providing quality control and residue analysis services needed by the Secretariat. However, these laboratories tend to give a low priority to requests related to chemical control. Furthermore, there is no facility for disposing stocks of obsolete products. Currently, distributors are advised to return their obsolete stocks to the manufacturer at their expense. This does not seem to be working as desired, and stocks continue to accumulate in the country.

On the staffing side, the ACB Secretariat has only five inspectors. Although as indicated earlier it can also deploy more inspectors from the phytosanitary and national seed certification services and the districts, these are not always readily available. With such a limited staff capacity, its geographic coverage, flexibility, and ability to respond promptly to undesirable situations are very limited.

The immediate impact of the inadequate funding and staffing of the regulatory service is that in practice enforcement is very limited. As a consequence, product adulteration is common, most retail shops have poor ventilation, and they lack the necessary first aid kit. The use of protective clothing is optional partly because the current rubber clothes are not adapted. Although not verified by the team, there are reports of products in the market that are not necessarily identical to those registered. For evidence of all these violations, Container Village<sup>15</sup>

<sup>15</sup>Shopping center consisting of retail shops shaped like containers.

in Kampala offers numerous examples. Although few in number, all retailers dealing with CPPs in some locations such as Lira have not duly registered their business or premise (shops) for selling agrochemicals. Furthermore, these shops are primarily used for general commerce. There are obsolete products in the market, and there appears to be no mechanism for safe disposal or for avoiding further accumulations. The fear is that public health may be endangered particularly given that there is no residue testing on food products and many business operators, particularly at the retail level, have limited product knowledge. Training is often provided to men (husbands), while it is the women (wives) who run the shop.

### **Potential of the Private Sector in Marketing Inputs**

The GOU has liberalized the marketing of agricultural inputs. The private sector is now performing all fertilizer import procurement and marketing functions including pricing. In spite of many constraints, after liberalization the private sector has made good progress. The number of market participants is slowly increasing, even though market size, associated business risks, and other constraints have acted as deterrents to private investment. However, the potential of the private sector in input marketing appears promising based upon the following:

- The policy environment remains generally favorable for private sector participation. Through the PMA and other programs, GOU continues to provide unwavering support for market-based agricultural development in Uganda.
- There is a growing awareness of the need for maintaining and restoring soil fertility as a key to improved agricultural productivity. The GOU, donors, and NGOs are expanding programs to improve the use of yield-enhancing technologies including fertilizers. This change in thinking and perceptions opens the door for growth in input use and business.
- Improved business linkages with large Kenyan importers have already resulted in lower import procurement costs. This has led to reduced fertilizer prices at the stockist level, which will improve farmer demand. There are more opportunities to develop such linkages.
- Commercial crop production is increasing, and this is resulting in improved demand for fertilizer and other inputs not only by the estates but also by an increasing number of smallholder out-growers.
- There are already over 300 private importers, wholesalers, and stockists in the market, and they need additional training and support to become more efficient and innovative.

### III. An Action Plan for Developing AIMs in Uganda

#### Rationale for the Action Plan<sup>16</sup>

The proposed action plan for strengthening the functioning of input markets and for encouraging greater participation of the private sector is based on the rationale of shifting the supply curve to the right. The assessment of all three sub-sectors has clearly demonstrated that the private sector has not responded as expected to the liberalization of input marketing in Uganda. The assessment stressed that high interest rates, lack of marketing skills and affordable finance, and inadequate regulatory systems continued to limit their active involvement in input marketing.

This slow response from the private sector may mislead policymakers, donors, and various stakeholders to revert to the old practice of subsidizing agricultural inputs and involving the public sector in their procurement and distribution. Such a move would be premature because it would divert the attention from removing the structural constraints to the participation of the private sector. The assessment of the AIMs in Section II clearly demonstrates that deregulation and liberalization are necessary but not sufficient to encourage private sector participation.

Years of discrimination and neglect have left the private sector underdeveloped and the input markets fragmented. Rather than returning to the past, the GOU and donors should persevere and invest resources in building the necessary human capital and marketing infrastructures and in strengthening the policy environment to further facilitate the private sector participation in input and output marketing. The private sector has considerable latent potential to perform marketing activities in an efficient manner; to realize that potential, however,

structural and capacity constraints restricting its development should be removed.

#### Shifting the Supply Curve to the Right

Figure 6 illustrates the typical supply and demand curves that economists use in explaining the behavior of prices in a free market situation. The horizontal axis indicates the quantity of input (e.g., fertilizer), and the vertical axis measures the corresponding price. The demand curve D slopes downward from left to right indicating that the quantity of fertilizer that farmers demand increases as the price of the fertilizer decreases and vice versa. The supply curve S<sub>1</sub> slopes upward from left to right indicating that as the price increases, the quantity of fertilizers that traders/manufacturers supply increases. At price OP<sub>1</sub>, quantity demanded equals quantity supplied (OQ<sub>1</sub>). Therefore, OP<sub>1</sub> is referred to as an equilibrium price and point A as an equilibrium point.

Assuming that the price OP<sub>1</sub> is very high (e.g., \$470/ton of 25-5-5+5S), the quantity traded is low (e.g., 5,000

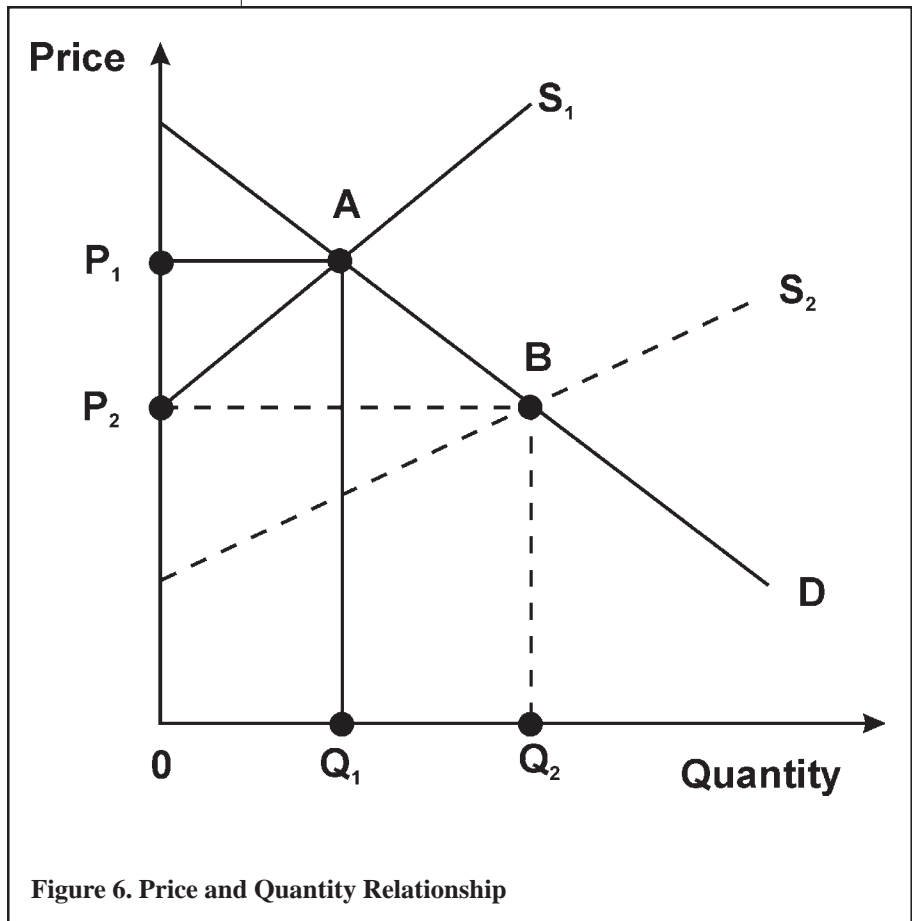


Figure 6. Price and Quantity Relationship

<sup>16</sup>This section is adapted from IFDC/DAI/MTL (2002), pp. 22-24.

tons of 25-5-5+5S). Because the resource-poor farmers in Uganda and other developing countries cannot afford to purchase fertilizers at such a high price, one possible solution is to provide a subsidy (e.g., 30%) and reduce the price to \$330/ton. At this price, the demand outstrips the supply and, therefore, some mechanism for rationing is required to allocate this limited quantity among all farmers. This solution was tried by many African countries, including Uganda, but could not be sustained due to budget deficits. In addition, it led to an inefficient use of resources, created parallel (black) markets, and induced smuggling of inputs into neighboring countries.

The position of the supply curve S1 on the vertical axis indicates that the minimum price at which the suppliers are willing to offer any quantity is high. In the case of Uganda, this is true because the market is small and suppliers incur high costs in procuring and shipping small quantities, thereby not benefiting from the economies of scale in procurement and transportation. Also, the suppliers are not sufficiently tapping into the cheapest sources in the global market due to limited access to information and finance. Because of all these constraints, the supply price is very high.

Rather than following the subsidy route, the price of fertilizers can be reduced by shifting the supply curve to the right—from S1 to S2. Such a shift in the supply curve is possible if the economies of scale in procurement and shipping can be realized and the fertilizers can be procured from cheaper sources through better access to information and finance. By shifting the supply curve to the right (point B), prices can be reduced, and the quantity of fertilizer used by farmers can be increased, thereby promoting food security at both household and national levels. Such a move also reduces the need for subsidies and ensures a higher return on the capital invested in business (because under the S2 supply situation, the fixed cost per unit sold is lower). Thus, by shifting the supply curve to the right, benefits can be created for all stakeholders—farmers, traders, and the country at large.

Can the supply curve for agricultural inputs in general and fertilizers in particular be shifted to the right in Uganda? The analysis of various constraints in this report suggests that these constraints have kept the supply curve at S1 position in Uganda. The removal of these constraints can help in shifting the supply curve to the right. Therefore, the proposed action plan embodies the measures needed to shift the supply curve to the right and thereby realize the latent potential of the private sector in supplying various inputs efficiently in a sustain-

able manner. In this context, the proposed activities include the development of human capital and improved financial services, market information system, and regulatory frameworks.

Although the primary focus of the action plan is on shifting the supply curve, which will help the farmers by reducing prices and making inputs easily accessible, technology transfer activities and output market development are expected to help the farmers in realizing more benefits and higher yields from the same amount of inputs. Thus, this activity will help the farmers in realizing more incomes by shifting the demand curve and improving nutrient use efficiency.

### **Creating a Supportive Policy Environment**

A conducive policy environment is essential for promoting development of input markets in Uganda. Several policy reforms were introduced during the 1990s. These reforms have removed unnecessary distortions such as price controls, subsidies on inputs, parastatal involvement in input distribution, and restrictions on the private sector participation in input marketing. However, there are certain issues that require attention if the private sector-based input markets develop in Uganda. These issues are elaborated below.

### **Macropolicy Issues**

Depreciation of the exchange rate and resulting inflation remain a critical constraint to the development of input markets. A depreciating exchange rate not only leads to increased prices of imported inputs but also discourages investment in input import business by increasing risks and introducing uncertainties in the investment climate. Thus, stability in the exchange rate is essential. By promoting exports and managing money supply and by rational use of foreign aid, the Bank of Uganda and the Ministry of Finance should try to generate stability in the exchange rate.

Efforts are also needed to reduce interest rates to an affordable level. Interest rates vary between 20% and 30% in urban areas and 30% and 48% in rural areas. Such high interest rates are detrimental to market development. By stabilizing the exchange rate, controlling inflation, and developing financial infrastructures, interest rates should be reduced significantly. Unless farmers and dealers can borrow funds for purchasing improved inputs, the modernization of agriculture would not be achievable.

The development of roads and other infrastructures in rural areas should receive priority in development efforts because such infrastructures facilitate the integration of

rural economies into national economies and help in reducing transaction costs. Ensuring physical security in rural areas also supports the development of well-functioning markets.

### **Market Development Issues**

Well-functioning input markets require a distortion-free policy environment, adequate human capital, access to finance, market transparency and information, and effective enforcement of sound regulatory systems. Because the GOU has removed most of the distortions in pricing and marketing of inputs, the policy environment is generally conducive for input markets. However, in the case of seed production and marketing, there is a need to remove the last policy obstacle to private sector participation in the seed market. Because USP has not been privatized, it receives hidden subsidies and public support for its operations and thereby creates distortion in the market by creating an unlevel playing field. USP should be privatized without further delay. Other pillars of market development are elaborated below.

### **Development of Human Capital-Dealer Networks**

Agricultural input distributors and dealers require marketing skills, business acumen, financial management, and technical know-how in order for input markets to function properly. However, in Uganda knowledge in these areas is very weak. Business linkages and knowledge of global and regional markets are also constrained. To create a cadre of entrepreneurs at all levels—upstream (import levels linking with global and regional markets for efficient imports) and down stream (wholesale and retails levels reaching rural areas), human capital formation efforts will be needed to create knowledge, analytical capacity, and expertise. Human capital should be created by providing training for dealers at all levels. Short training courses (of 2-3 days duration) will be needed to train potential entrepreneurs in all aspects of the marketing chain. There is much merit to the “seeing is believing” approach. Product demonstrations will be key to training dealers and farmers in product use and benefit. Training is also needed for wholesalers and importers in agri-input marketing. Training courses should focus on business planning, financial management, technical knowledge, and technical knowledge about various aspects of nutrients, products, chemicals, and seeds.

For importers and wholesalers, overseas study tours should be organized to achieve a more enduring impact on acquiring and retaining skills and knowledge. Biannual regional workshops among importers of the East

African Community (Kenya, Tanzania, and Uganda) should be organized to disseminate information about market conditions and develop business linkages so that Ugandan importers can combine their orders with large Kenyan importers and benefit from economies of scale in procurement. Training about various aspects of procurement should also be conducted.

With liberalization of the seed market, many private companies have entered the seed market. However, these companies have limited technical knowledge about seed production, and many small farmers lack necessary technical skills to grow quality seed. With new developments in maize exports, Uganda cannot afford having poor-quality seed produced by small farmers. This area falls under public goods because private companies cannot capture the benefits of training; they are unlikely to provide training for seed production, even to their contract growers. In collaboration with NARO, MAAIF and donors should organize training programs for seed growers so that quality seed could be supplied to the markets. Training programs for private seed companies should also be organized.

Training and technical assistance to USTA members through workshops and seminars, in areas that will benefit the seed traders and farmers, could play an important role. Generally, increasing awareness of the farming community and the entire population of the benefits and use of agricultural inputs will stimulate demand and lead to further development of the network system. Use of seed promotional activities and materials is another method that can reach far and wide.

Another area that requires efforts in human capital formation is the public sector. MAAIF’s ability to enforce quality control regulations for seed and CPP is limited. MAAIF also has few resources to develop and operate market information networks. Adequate resources should be allocated to train manpower for enforcing regulations and operating market information systems. Analytical capability for processing information and formulating policies and regulation is weak. In addition, overseas training and study tours should be arranged to strengthen analytical capacity.

### **Improving Access to Finance**

Limited access to funds for business development is an area that demands attention. High interest rates and stringent collateral requirements make it difficult to borrow funds from commercial banks. Although some banks

have started pilot efforts in lending funds to importers and dealers, such efforts have limited outreach. To encourage risk-averse commercial banks to expand their portfolios to include agricultural input firms, two funds should be created; these are AIIF and SIBDF. The design of the AIIF fund would be such that input importers would be able to secure a letter of credit through commercial banks by using 30% as a down payment for the needed foreign exchange. The commercial bank dealing with the importer would assume a 40% risk, and the Bank of Uganda, managing the credit guarantee fund, should bear a 30% risk. Experience from other countries indicates that well-trained and viable importers will have little risk of default. Gradually, as business expands, commercial banks may bear the full 70% risk in financing imports. Similarly, a local currency fund should be created to support the development of small input businesses. The same risk-sharing arrangement can be created for this fund. A dealer interested in starting a business should provide 30% of the capital needed to start the business, and the commercial bank should provide a commercial loan for 70% of the required funds. However, to minimize risk for the commercial bank, the SIBDF would provide a guarantee for 30% of the needed funds, thereby reducing the commercial bank's exposure to 40%. The purpose of this guarantee fund is to encourage commercial banks to engage in lending for business development in the short run and develop a good clientele for their operations in the long run. Also, the fund will help to reduce collateral requirements; stringent collateral requirements make it nearly impossible for small dealers to borrow funds for business development. Moreover, to strengthen the linkage between bankers and dealers, training, study tours, and consultation should be promoted.

### **Market Transparency Through the Creation and Operation of MIS**

There is an urgent need to improve market transparency—a key to market efficiency. This can best be accomplished through creating and developing an information unit within the Ministry of Agriculture and strengthening the market information activities presently in place to include information on input markets (e.g., prices, supply availability, import arrivals). The objective of this activity would be to provide accurate and timely information to all distributors/dealers on market conditions for all agricultural inputs.

Information is crucial for the proper functioning of agricultural inputs and product markets. Dealers, importers and other participants in the marketing chain need

information about local, regional, and global market situations for inputs and products to strengthen their bargaining power. The more accurate, detailed, and timely the information, the easier it is to develop market plans and make decisions. With the rapid progress in electronic data processing, it has become very easy now to collect, collate, analyze, and store data. Furthermore, with the widespread use of e-mail and the Internet, it has become easier to exchange or obtain valuable data and/or information that are timely and constantly updated on almost any subject at a very small cost.

Presently, the International Institute for Tropical Agriculture (IITA)-implemented Food-Net project<sup>17</sup> in Uganda is collecting, documenting, processing, and disseminating daily, weekly, monthly, and yearly output market information at national and local levels to improve the flow of market information. However, its links to the private and public sector agencies in the country are weak, and it is not providing training in market studies and agro-enterprise development to build the local capacity for its sustainable development. However, a large quantity of data and information that the project collects and disseminates is useful and should be integrated with private sector needs.

Data related to crop response rates, profitability of fertilizer use, farmers' fertilizer use by crop, and fertilizer recommendations are diffused among the agricultural research institutes and the university. But, there is no organization systematically collecting, analyzing, and disseminating information on inventories, sales, imports, distribution, and consumption of agricultural inputs and products in Uganda. The only data available are imports recorded by the Uganda Revenue Authority (URA). However, the URA data set includes only products formally coming into the country. Furthermore, it is not recorded in a format that easily lends itself to market analysis due to the coding scheme that URA uses. There is not much awareness of the international situation and the prevailing global prices of agricultural inputs, especially among the distributors. As a result, linkages with the international input manufacturers or traders are weak. Even on

<sup>17</sup>The Food-Net project is a regional agricultural research and development network focusing on market-oriented research and sales of value-added agricultural products. The project partners include ASARECA networks, national programs, universities, international agricultural research centers, NGOs, CBOs, farmers, processors, manufacturers and other agricultural sector stakeholders within the ASARECA region.

a regional basis there is a lack of information about what is happening in the neighboring countries and in Kenya in particular. Consequently, market planning in the absence of data is not easy, and incorrect decisions leading to unsuccessful business ventures are not uncommon.

Ideally, the private sector should play a leading role in developing Uganda's MIS through dealers' associations. In addition to various other responsibilities, the secretariat of trade associations works to maintain a bank of data collected on a periodic basis (e.g., monthly) from all members on a standard data sheet. Typically, this would not include confidential data or information such as companies' prices, sales plans, or costs. This data could be collected by the middle of each month and circulated to all the members soon after to allow them to be in a position to properly plan their activities. The association would also maintain awareness of the international markets by using the Internet and various trade journals. In addition, the association could develop linkages with other similar associations in and outside the region for the exchange of data and information. The association could also collect useful data and information on agriculture in Uganda and within the region (for comparative purposes).

Trade associations currently in existence have not reached this level of sophistication. Until they are well established, active, and ready to perform this critical function, the MAAIF working with the private sector (as an Agri-Input Development Center of Uganda), should perform all the necessary data collection and processing activities and disseminate the information periodically (e.g., before the end of every month). Such data and information should also be available on all modern agricultural inputs. This is an activity that needs to be established as soon as possible to improve planning efforts and, thereby, the all-round development of input markets.

A well-functioning agricultural market information system will benefit traders, farmers, government policy decision makers, international and regional trade organizations, donor agencies, and the community at large. To ensure that the information reaches the end users on time, it should be diffused at regular intervals through different media (e.g., a Uganda Agricultural Market Information Network website), the print media, radio and television. Meanwhile, input dealers in Uganda should be encouraged and organized to form trade associations and be linked with other associations in the region. As the association grows it could assume a larger share of

responsibilities in the public-private sector partnership for the management of the agricultural market information. The challenge, however, is to develop a low-cost MIS that is financially sustainable and responsive to client needs. This will take time to develop and will require government and donor support.

### **Strengthening the Regulatory System**

The day-to-day operation and enforcement of the statute and supporting regulations for fertilizers, seeds, and pesticides are the responsibility of the Secretariat, the phytosanitary services, and NSCS. Though critical to the development of efficient and safe input markets, the regulatory service provision in Uganda is poorly funded and inadequately staffed. This negatively affects their geographic coverage, flexibility, and ability to respond promptly to undesirable situations. Actions needed to strengthen these services for each market are described below.

#### **The Seed Market**

The following measures are needed to strengthen the seed quality control system:

- Adequate and timely funding from the Central Government for regulatory activities is paramount to facilitate the NSCS to undertake inspections, variety testing, and quality control activities and to monitor countrywide seed stockists.
- Clear written policies for vegetatively propagated crops, fruit trees, informal sector, and vegetable seeds should be implemented to guide further development of the seed industry. Appropriate measures to supervise production and ensure quality of products.
- Capacity building and awareness of the laws and regulations governing the seed industry should be furthered. Training and provision of technical support in the form of pamphlets, brochures, and handbooks to the stakeholders who include law enforcement officers, tax authorities, inspectors, policy makers, local council officials, seed companies, NGOs, and district and extension staff.
- Various players in the seed sector should be registered. USTA should establish a code of conduct for its members in such areas as proper seed storage, fake and noncertified seed, and withdrawal of old seed stocks. Building internal quality control mechanisms and training of staff of seed companies are required.

- The National Seed Testing Laboratory and cold room facilities need to be upgraded and staff trained. Private seed laboratories should be accredited to carry out some of these functions.
- Enacting and updating intellectual property rights legislation in line with international conventions.
- Analytical facilities need to be developed for testing fertilizer quality, chemical active ingredients, and seed quality to keep the required international standard products on the market. Items such as moisture meters, cold rooms, seed cleaning equipment, warehousing and approved fumigators should be installed.

### **The Fertilizer Market**

Although few cases of adulterated fertilizer products were reported to the team, quality control standards will need to be enforced as the size of market increases. Also the current practice by dealers of selling products in 1-kg and 5-kg bags presents opportunities for adulteration. Quality control regulations and truth-in-labeling standards should be established to ensure that fertilizer products in the marketplace are properly labeled. Such regulations must deal with both quantity (measurements) and nutrient content of the products. Enforcement of such regulations should be in accordance with market-based systems.

### **The CPP Market**

Actions necessary for strengthening the regulatory services related to the CPP market include the following measures:

**1. Amending the Statute and Supporting Regulations**—The statute and the supporting regulations are widely acceptable to most stakeholders with a caveat that the regulations apply for both fertilizers and pesticides, thereby creating some ambiguity at times. Furthermore, some statements are not precise. The existing statute and supporting regulations thus need to be reviewed and adapted to the current liberal market environment.

A review of the existing statute and supporting regulations is also needed to ensure that the regulatory framework is consistent with the regional harmonization efforts. These efforts seek to facilitate the development of a regional market to increase market sizes and thereby induce greater private investment and more effective input supply systems. The phytosanitary regulations should be harmonized, and a plant health passport-like document should be used

to reduce the spread of pests. It also involves harmonization in the area of product testing and registration and the development of a system of regional accreditation for inspectors.

Currently, the regulatory framework in Uganda provides for a full, temporary and restricted product registration. To be registered a product has to be tested in-country for a minimum of three growing seasons (6 months for animals) at a fee, and approval is granted or denied within 6 months thereafter. If regionally harmonized, the regulatory agencies would formally grant full release either automatically or after a shorter period of tests to products approved in other countries in the region depending on the case.

Another needed amendment is the inclusion of a biosafety component to the set of statutes and regulations. Furthermore, as indicated earlier, Uganda is in the early stages of developing a biotechnology program. Even though a national biosafety framework has been inaugurated, plans to formulate biosafety regulations have already been initiated by the Uganda National Council of Science and Technology (UNCST), and NARO has put in place a strategy for building biotechnology capacity, additional efforts are needed for developing skills to interact with the international private sector.

Finally, initiating routine testing of products when they are still under URA consignment would improve quality and consistency with the specifications in the registration certificate. Typically these products are kept under URA consignment for 2-3 days. An effective mechanism would have to be implemented to ensure that the testing service is informed as soon as the products are under URA control. If testing results cannot be obtained within the 2-3 day period, a temporary bill of entry can be provided whereby the product can be impounded if the test proves to be unsatisfactory.

In response to these concerns, there is an ongoing effort that needs to be supported aimed at amending the current regulations to address some of these concerns. The amendments focus on more stringent penalties, separation of regulations for fertilizers particularly truth-in-labeling and inclusion of stakeholders (e.g., NEMA and NDA) who were not in existence when the regulations were enacted. Similarly there is an effort to develop appropriate biosafety regulations by the NCST. Involving the private sector in the re-

view would be beneficial because it ensures that all aspects of the needed amendments are dealt with.

## **2. Strengthening the Analytical Capacity of the ACB Secretariat**

—The day-to-day operation and enforcement of the statute and supporting regulations are the responsibility of the Secretariat and its inspectors. However, funding constraints hinder not only effective operational requirements but also the analytical capacity. Two commercial laboratories (UNBS and Chemifa) exist in Uganda that are accredited for and capable of providing quality control and residue analysis services needed by the Secretariat. However, these laboratories tend to give a low priority to requests related to chemical control. Therefore, there is a need for strengthening the analytical capacity of the regulatory service at least in terms of laboratory for referral to ensure a speedy and timely provision of the testing services, including for testing residue levels in food products and getting organic certificates.

## **3. Increasing the Number of Inspectors**

—The ACB Secretariat only has five inspectors. Although, as indicated earlier, it can also deploy more inspectors from the phytosanitary and national seed certification services and the districts, these are not always readily available. With such a limited staff capacity, its geographic coverage, flexibility, and ability to respond promptly to undesirable situations are very limited. It is therefore desirable for the Secretariat to have its own permanent staff on the ground throughout the country rather than depend on other services. This would allow the service to be flexible enough in its ability to rapidly deploy staff in response to circumstances and thereby perform effectively.

## **4. Dealing with Obsolete Stocks**

—There is no facility for disposing of obsolete products. Currently, distributors are advised to send their obsolete stocks back to the manufacturer at their expense. This does not seem to be working as desired given that such stocks continue to pile up in the country. Although there has been no systematic inventory of obsolete stocks throughout the country, most stakeholders agree that the situation does not seem to have reached alarming proportions. Nevertheless, it requires immediate attention to minimize the risks to public safety and the environment. Typically the investment costs associated with such infrastructure are high and beyond the budgetary capacity of the MAAIF. Donor support is needed to build such an infrastructure in Uganda. Alternatively, however, Uganda can examine an option

in the region where such a service already exists, such as in Kenya, and develop a mechanism for not only disposing of current stocks but also limiting future accumulation of obsolete stocks. This is an area where a public-private partnership can be very effective, particularly if the private sector is organized into effective associations with self-monitoring mechanisms. Addressing the problem of obsolete stocks should involve not only the destruction of current obsolete stocks but also regular inventory of CPP stocks and identification of obsolete products with a mechanism for preventing further accumulation of obsolete stocks. It is also necessary to establish government guidelines to avoid accumulation of obsolete stocks in the public sector.

## **5. Regulatory Agencies for Enforcement and Education—Conflicting Missions**

—Part of the reason for the widespread violations of the statute and regulations pertaining to CPPs in Uganda is the tendency of the regulatory service to favor educating traders over enforcing the law because the industry is still very young. Proponents of this position argue that a strict enforcement of the statute and supporting regulation would likely lead to the closure of most if not all retail shops, particularly in Container Village. Such a move would be detrimental to agricultural development and economic growth, at least in the short term. Consequently, a more gradual evolution in enforcing the regulations coupled with education is needed to nurture the development of the industry. To some degree this position may be justified. But, it is important to recognize that the decision to favor education over enforcement is simply a reflection of the failure of the appropriate services of the MAAIF, importers, and manufacturers to play their critical educative role in input marketing in Uganda. Many retailers lack the necessary product knowledge to operate CPP businesses safely. Similarly, farmers and the general public lack the necessary product knowledge concerning safe use.

The issue with regard to enforcement of regulation in Uganda is a complex one. In addition to the funding and staffing constraints referred to earlier, the central question that the ministry also needs to address is whether an agency responsible for performing the regulatory role can find the proper balance between education and enforcement without jeopardizing both public health and agricultural development. Indeed, because fundamentally there is a conflict between the

two roles, it is quite difficult not to argue against this strategy, particularly when the same inspector providing advice is also responsible for enforcement. Therefore, it is recommended that the regulatory agency should focus on its statutory function of enforcing regulations and develop effective partnerships with other appropriate and separate organizations responsible for providing educational services.

### Technology Transfer Activities

The main focus of this action plan is on the supply side of the market equation. However, measures are also proposed to promote input demand by undertaking activities in the area of technology transfer because the lack of knowledge by farmers about soil fertility management and new technologies is a serious impediment to the adoption of new technologies. Demonstrating and giving training about the proper use of improved seeds, fertilizers, and CPPs to farmers may aid in the promotion of the development of input markets.

Improving farmer knowledge on fertilizer use and use benefits is essential for market development. The proposed interventions should not directly involve research but rather seek to encourage the NARO to conduct further research to establish fertilizer recommendations by crop and agroecological zone and work to disseminate information on fertilizer recommendations to appropriate government, nongovernment, and private sector organizations and farmers.

Farmers' knowledge of fertilizer use efficiency and benefits is extremely deficient in Uganda and is a fundamental constraint to fertilizer use by smallholders and to improved use by those farmers (cash crop farmers) currently using fertilizers. Efforts to eliminate this constraint can best be approached (as is presently being done on a limited scale by IDEA and SG 2000) through market mechanisms, specifically the commercial marketing system. The MAAIF should concentrate on training extension workers in critical problems and use such trained extension workers to educate dealers and farmers in basic fertilizer use techniques. Three approaches are recommended: (1) direct training, (2) fertilizer use demonstrations on farmers' fields, and (3) development/dissemination of technical bulletins on proper fertilizer use. For illustrative purposes, a brief description of the proposed activities follows.

- **Training**—Dealers are the final link in the marketing chain and, as such, best positioned to provide fertilizer use advisory services to farmers. Training efforts should

be targeted to emerging dealers. The proposed training would focus on improving their understanding of (1) nutrient requirements of various crops; (2) soil-water-nutrient relationships in crop production; (3) fertilizer products, their nutrient content, and performance characteristics; (4) technical aspects of fertilizer handling and storage; and (5) farmer economic benefits from improved fertilizer use.

- **Demonstrations**—Farm-level demonstrations are essential to stimulate demand. They provide farmers the best opportunity to learn by seeing the impact of fertilizer use on crop production. A series of demonstrations involving fertilizer use in selected crops should be conducted in selected target zones using recommended seed varieties, fertilizer use at recommended levels, and recommended management practices. Ultimately, emphasis will be on encouraging private dealers to participate in demonstrations through cost-sharing relationships, thus strengthening farmer-dealer relationships.
- **Educational Leaflets**—Educational leaflets in English and local languages are needed to improve dealer knowledge on the nutrient needs of specific crops (by area) and which fertilizers supply the most economic source of plant nutrients; both are essential to smallholder commercialization.

These efforts could make dealers new **technology transfer agents** to supply services demanded by farmers under NAADS and open new opportunities for public-private partnership.

### Development of Output Markets

Although the main focus of this action plan is on AIMs development, it is recognized that the development of crop output markets is essential to sustain the improvements in input markets. Well-functioning input markets will lead to the adoption of modern technologies and increased crop output. Unless farmers have access to markets to sell this additional output and recover their investments in inputs, they will not have a sustained interest in pursuing new technologies, as happened in 2001. Significant increases in maize production led to lower maize prices because farmers had no outlets to sell the product. This in turn led to losses because farmers could not pay the loans they borrowed and therefore reduced input use. Because of limited resources, this study could not fully assess the factors constraining the performance of output markets. However, it is suggested that crop markets be integrated by developing marketing infrastructures and

information systems, improving marketing and financial skills and resources, and linking local markets with national and global markets, as is being done for maize and horticulture crops. Developing agricultural processing and contract farming can also help to reduce risks associated with price and weather uncertainties. In this context, MAAIF's recent efforts to focus on selected commodities for export promotion are laudable, but it must be *stressed* that the GOU should not be tempted to introduce new distortions that can compromise the development of private sector-based input markets. The PMA study on competitiveness of crop production and other such efforts should pay more attention to developing output markets. In fact, well-developed output and input markets could create synergistic results for rural development in Uganda.

The marketing of agricultural produce starts on the farm because the handling of the crop at harvest time affects the marketability of the produce. Quality has been a main weakness of Ugandan produce, including coffee for which Uganda is famous. Any efforts to boost marketing of produce must start by addressing post-harvest handling problems on the farms. Extensive use of simple storage structures like cribs and drying and sorting by farmers can go a long way toward improving the quality of agricultural produce.

Another constraint in the marketing of Uganda's produce is the small quantities produced by the numerous scattered smallholders. Thus far, product aggregation has been undertaken by traders with the result that the largest percentage of trade profits accrues to them rather than to the farmers. If farmers are to ask for good prices for their produce, they need to pool their produce to raise sufficient quantities to attract buyers. ADC/IDEA Project has been supporting the formation of such produce marketing centers called Rural Agri-Markets (RAMs). Apart from aggregation of produce, RAMs should also improve the quality further by drying, sorting, and grading. They should also provide shelling facilities to their members. These RAMs should act as processing centers with simple machinery like shellers, driers, cleaners, and bagging equipment. The group will insist that certain quality parameters are adhered to. The increased volume and better-than-average quality will allow that produce to command a premium in the marketplace. The group should be able to convey to the members how to store produce in such a way that quality is maintained for as long as possible.

Similarly, SG 2000 has embarked on promoting the establishment of one-stop centers manned and owned by farmer groups in their own locations. At these centers, agricultural processing to add value to the produce is conducted. Local training, finance management, and input delivery are all expected to be handled in the one-stop centers. These one-stop centers will help improve output marketing.

Lack of appropriate, accurate, and timely market information is another constraint that needs to be addressed. Rural farmers hardly know about prevailing market conditions for their products (or inputs), and often traders do not know where to obtain commodities they want. Following liberalization of produce marketing, the GOU was supposed to provide market information, but this has not been done. As mentioned earlier, Famine Early Warning Systems Network at ADC and FOODNET at IITA/Uganda are attempting to do this. It is important to coordinate these efforts and also improve the dissemination of this information to farmers and other stakeholders.

With excellent agricultural potential, Uganda's general endowment means that there is generally enough food available in the country. This implies that the internal market is severely limited, and efforts should be directed to export markets. Luckily, a good market exists in countries surrounding Uganda (in Eastern, Central, and Southern Africa). Until recently, only *ad hoc* exports have been made to these markets through such international relief agencies as World Food Programme. However, the formation of the UGT and the subsequent execution of a supply contract of 30,000 tons of white maize to Zambia are in the right direction. UGT needs to be supported and strengthened. One of the challenges of trading in agricultural produce is the seasonal nature of the commodities. UGT needs to buy and hold stock if it is to respond to export market signals quickly, which requires substantial financial outlays. Resources will also be needed to establish standards and regulations of quality for export markets. Government and development partners should support this cause.

At the political level, efforts in forming regional trading blocks like the EAC and Common Market for Eastern and Southern Africa will enhance the chances for Uganda to exploit trade opportunities in products where it has a comparative advantage. However, more efforts are needed in infrastructure development so as to reduce transaction costs associated with transport. In the case of

landlocked Uganda, rehabilitation of the railway network would be extremely beneficial. In this regard, New Partnership for Africa's Development should play a lead role in building regional infrastructures.

### **Regional Integration of Markets**

AIMs are at their infancy in Uganda and therefore small in size. Such small size prevents the economies of scale in production and procurement and results in higher prices for various products. Developing linkages between traders in Uganda and neighboring countries could help to reduce prices for inputs such as fertilizers and CPPs. As explained in Section II, even by developing ad hoc linkages with Kenyan importers, Ugandan importers were able to reduce fertilizer prices by 30%-36% during the 1998-2000 period. Strengthening such linkages could lead to a further reduction in fertilizer prices.

Promoting cross-border trade in seed can help farmers to acquire improved seeds at lower prices and open opportunities for seed exports from Uganda. Some regional seed companies, such as East Africa Seed Company of Kenya, Seed Company of Zimbabwe, and PANNAR Seed of South Africa, are exploring possibilities of growing and exporting seed from Uganda. On the output market side also, there is a need for developing linkages with markets in neighboring countries because any significant increase in domestic production may not be absorbed in the local markets and will need to be exported to prevent the collapse in domestic prices. Obviously, development and crystallization of such linkages will need further work in terms of assessment of constraints and opportunities, and training and technical assistance for dealers to create the necessary human capital.

### **Other Technical Issues**

#### **Biotechnology**

Biotechnology offers opportunities to boost productivity and reduce the need for chemical CPPs by using improved crop varieties with built-in disease and pest resistance traits. Modern biotechnology tools such as tissue culture, micro propagation, and genetic engineering promise higher increases in agricultural yields and environmental management than would be achievable by conventional research tools. If adequately exploited, biotechnology can help Uganda accelerate economic growth through increased agricultural productivity and improve environmental management by reducing the need for pesticides and developing more biodegradable products.

Uganda is in the early stages of developing a biotechnology program. Initial steps have already been taken to develop a policy and institutional framework. A national biosafety framework has been inaugurated. Plans to formulate biosafety regulations have already been initiated by UNCST. NARO has implemented a strategy for building biotechnology capacity (Braunschweig et al., 2001). GOU is funding a 5-year initiative implemented by International Network for Improvement of Banana and Plantain (INIBAP), NARO and others to develop transgenic East African highland bananas with resistance to black sigatoka disease, nematodes, and weevils (INIBAP, 2000). At the regional level significant efforts are underway for developing a regional biotechnology program and strengthening national institutions for member countries (Alhassan, 1999). Nevertheless, there is a need for strict regulation, biosafety guidelines, public education, and funding for genetic and experimental research.

#### **Seed Production**

In addition to the market development issues identified earlier, there are a few additional issues related to seed production that warrant separate discussion. These relate to breeder seed production and pricing. Currently, NARO has responsibility for breeder seed production and supply. Not only is the supply inadequate but also the pricing is inconsistent. USP obtains free seed from NARO but private companies have to pay an arbitrary price. NARO should formulate consistent pricing so that it can recover at least the operating cost of seed production. Because the lack of funding prevents the production of breeder seed by NARO, funding should be improved and mechanisms should be established to encourage breeder seed production in the private sector. Price recovery can partially help to address the funding issue, but the GOU and donors should ensure adequate funding for breeding research. ASARECA/ECAPAPA can take a lead in harmonizing breeder seed issues in the region.

#### **Public Health and the Environment**

With limited enforcement of the CPP statute and supporting regulations, unsafe product handling and use will continue to be common in Uganda. Furthermore, low standard storage management, inadequate facilities (e.g., inadequate ventilation), and the availability of adulterated products (e.g., diluted Round Up or Furadan mixed with sand) will continue to be a concern. Under such conditions, it is difficult to make people accountable. Unscrupulous behavior can ruin the reputation of com-

panies playing by the rules. More importantly, the health of the general public and farmers may be negatively affected as a result of residue buildup in the food chain and contamination of drinking water. Even gains in factor productivity could be lost through pesticide resistance buildup and loss of natural predators. Therefore, the development of a health-friendly CPP market requires that this market be properly and effectively regulated and monitored.

However, it is important to recognize that, by itself, enforcing the statute and regulations will not be enough to ensure public safety and to protect the environment. The challenge for Uganda is to find ways to develop the CPP market in the context of decentralization through enforcement and education in a way that minimizes negative externalities. Meeting this challenge requires that the following efforts be made:

- Promoting and facilitating the use of less toxic CPPs.
- Intensifying research and extension on bio-control and IPM (crop rotations, pheromones, biological control, Bts, and biopesticides).
- Developing easier, cheaper, and low-risk regulations for biopesticides with appropriate risk tests.
- Intensifying residue testing on food products.
- Developing user-friendly, cheaper, small and low-risk packages of CPPs.
- Providing the population with adequate information/instructions for safe and effective use.
- Strengthening the capacity of the health services to deal with cases of pesticide poisoning.

### **Expected Benefits**

The implementation of the action plan will contribute to the achievement of the GOU's goal of eradicating poverty, ensuring food security, and protecting the environment by enhancing agricultural productivity through lowering prices of inputs, improving access to inputs in rural areas, and accelerating the adoption of new production technologies. With well-functioning AIMs, input consumption is expected to increase, which will lead to increased production per unit area and per capita. The development of output marketing will help commercial and small farmers to realize increased incomes, improve stan-

dards of living, and above all ensure household food security. At the national level, such developments will help to earn more foreign exchange by export promotion and import substitution.

### **Lower Prices and Timely Availability of Inputs**

The most significant benefits of the action plan will be lower prices and timely availability of inputs in rural areas. Inputs will be available to farmers near their farms. The distances currently traveled by farmers to purchase inputs will be drastically reduced because the new cadre of dealers will be located much closer to the villages. It is possible that input prices for seed and fertilizers may decrease by 20%-30%. Reduced cost of transportation and travel by farmers will provide an added benefit.

Overall, the developed marketing system will provide the following:

- Timely supply of fertilizer products and other inputs in convenient proximity to farmers.
- Appropriate product mix (i.e., grades compatible with crop and soil requirements with emphasis on the most economic products).
- Appropriate packaging (i.e., 5-kg bags for smallholders, 50-kg bags for adopters).
- Credit services at all levels in the supply system.
- Dealer/stockist providing advisory services to farmers.
- Competitively priced products.
- Widespread, integrated, and competitive network of dealers.

### **Better Access to New Technologies and Higher Incomes**

As input and output markets become more competitive, Uganda's farmers will have better access to a full range of seed and other technologies necessary for a diversified and productive agricultural sector. Consequently, the income farmers would receive from agricultural production will rise as their productivity and marketing opportunities improve. Eventually agricultural transformation will begin to take place. As this transformation expands, more and more people will move out of agriculture into rural non-farm income-generating activities, and income levels from wage employment and services will increase.

### **Enhanced Food Security**

Increased use of modern inputs will aid in promoting food security at both the household and the national levels because farmers will be producing more grains and legumes. Economic and efficient use of inputs by farmers will certainly contribute to national granaries. Even the resource-poor farmers will be able to increase their crop production by using inputs in larger quantities.

### **Environmental Protection**

The soils that feed the crops that feed the nation are the most important natural resources of Uganda. These natural resources should be sustained and preserved for future generations. This can happen only when the nutri-

ents removed from the soils are adequately replenished and reserves of nutrients are stored in the soils. By promoting the increased use of mineral fertilizers and soil fertility-enhancing practices, the action plan will contribute to the protection of the natural resource base.

### **Foreign Exchange Earnings and Savings**

The action plan will contribute to enhancing the foreign exchange earnings through export promotion and food import substitution. By diversifying the cropping pattern toward legumes and groundnuts, the action plan will aid in reducing reliance on a few crops for foreign exchange earnings.

## IV. Institutional Arrangements for Implementing the Action Plan

### Holistic Approach and Sequencing of Activities

Important policy and organizational reforms have been implemented in Uganda to allow the private sector to assume responsibility for agricultural inputs marketing after the government withdrawal from their direct procurement and distribution in the 1990s. Despite these reforms and the economic program, total fertilizer consumption remains one of the lowest in the world (less than 1 kg of nutrients/ha) and input prices have been the highest. Furthermore, the seed industry remains dormant. Wholesale and retail activities are concentrated in urban centers. Public health is endangered by inappropriate handling and use of chemical products.

Many of the changes made have focused on policy reforms. USAID's IDEA project and SG 2000 have made progress in developing the dealer network, but their efforts are limited and need scaling up to cover wider geographical areas. Clearly, as is the case in many other countries that have adopted this reform path, policy reforms are necessary but not sufficient for the development of well-functioning input markets, especially in those economies where the public sector monopoly dominated. This is largely because such an approach does not consider issues related to other components of the agribusiness system. The agribusiness system comprises the manufacture, production or procurement of inputs; the marketing of these to farmers (including the provision of technical advisory services to farmers); and the use of these inputs by farmers in crop production to enhance agricultural productivity and farm income (Figure 7). It also involves the sale and value-added sorting, grading, storing, processing, and marketing of foods and fibers as food products for livestock or human beings or as inputs for other industrial manufacturers.

Farmers and farm production are at the center of the total system with both vertical and horizontal dynamic linkages among all the sub-components and the facilitating services required for

each of the sub-components. The performance of an agricultural input supply system is only as robust as the weakest link in the total agribusiness system. As a result, to ensure that these links are strengthened, a holistic approach to promoting sustainable input marketing systems is imperative.

Developing input markets in Uganda will require concurrent efforts to stimulate demand for inputs, eliminate constraints to market development, and foster sustainable development of the private sector. The development process can best be addressed through direct interventions (e.g., technical assistance and training aimed at technology development, nurturing business development and establishment of business linkages, credit system development, improving information flows, and human capacity building). Key activities to establish an open and freely competitive fertilizer market and increase private sector participation and investment include (1) policy analysis and government reform of restrictive practices, (2) fostering trade including forging business linkages with established importers/markets in Kenya, (3) stimulating demand through technology transfer and improved awareness among smallholders, (4) credit system development, (5) human capacity building to improve performance of marketing functions, and (6) improving market transparency and regulatory systems.

Therefore, to realize the full benefits of the activities proposed in this plan, they should be implemented in a holistic manner so that the synergy of various activities could be captured. Developments in the financial sector,

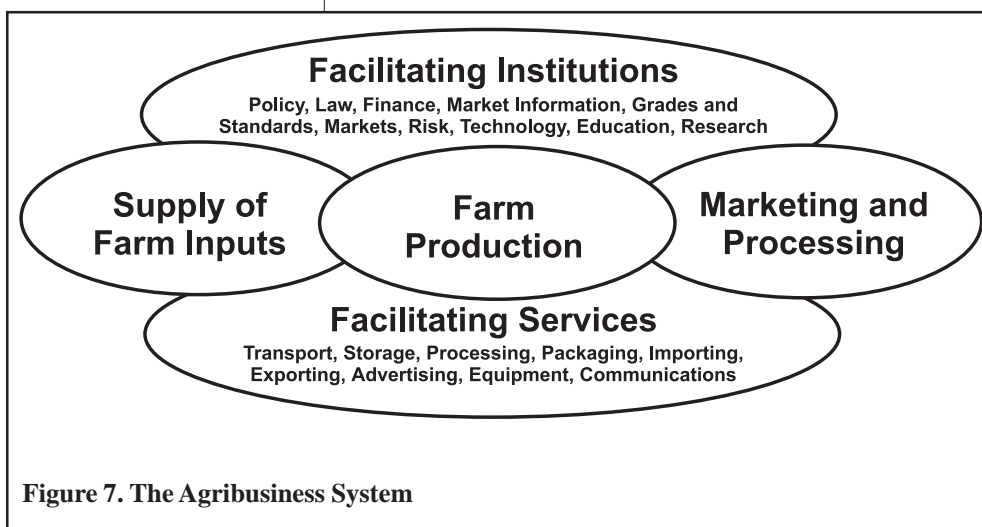


Figure 7. The Agribusiness System

market information, monitoring and regulation in the marketplace, and human capacity building should support activities in policy reform. Without financial resources, trained entrepreneurs cannot put their training to work. Likewise, laws and regulations about truth-in-labeling should be fully enforced so that unscrupulous traders do not compromise the good reputation of law-abiding traders and the quality of the products they sell. To integrate various segments of the market efficiently, these traders should also have access to the information about national, regional, and global markets.

### **Public-Private Partnership**

Years of civil war, political instability, and economic mismanagement resulted in high inflation, food insecurity, and absolute poverty in Uganda. Economic reforms delivered a strong agricultural growth (particularly during the second half of the 1990s) and enthusiastic participation of the private sector in input supply. However, they eventually failed to yield the expected results in part because the reform process failed to build the necessary institutional and infrastructure support for competitive markets. It has now become clear that the private sector cannot develop input markets on its own to an efficient level without the public sector support through appropriate policies and institutions.

Both the public and private sectors have interlinked roles to play, and they need to work together as partners, with each party bringing its strengths to the relationship. For input market development, as in other sub-sectors of the economy, both the private and public sectors need a greater understanding of which functions remain in the public domain and which ones in the private domain. Working in partnership in developing input markets facilitates discussion as to the main issues and how they might be resolved successfully. Furthermore, such a partnership helps achieve the following:

1. Offering the opportunity to develop a common agenda and to exchange information and data.
2. Facilitating the development of input markets in an efficient and cost-effective manner for both the public and private partners by offering the opportunity to best leverage their combined resources and creativity.
3. Enabling the MAAIF to devote more of its resources to core functions—the delivery of essential public services and regulations—and thereby allowing for better use of public resources.
4. Increasing the efficiency of the public sector by allowing it access, in an orderly and disciplined man-

ner, and benefit from the private sector expertise with respect to the efficient execution and administration of certain functions.

5. Ensuring that preferences of the private sectors are reflected in the choices and design of interventions.
6. Transferring useful expertise and skills to the private sector, thereby creating economic opportunities in the private sector.
7. Improving the implementation, transparency, and accountability.

However, it is important to understand that public-private partnership and communication is not a single act or that of a few meetings. It is and should be a continuous process. Furthermore, it is not and would not always be easy to bring both public and private interests together as equals. What is critical is the parties' willingness to come together and discuss issues and try new ideas with the understanding that everything is not going to be a success. Successes breed second-generation problems that need to be addressed also. The occurrence of problems throughout the process usually does not offset the benefits of collaboration. This rule fails only when one side is trying to take advantage of the other.

In Uganda, there are several opportunities for public-private partnership in both the short and long terms. These include:

1. Partnership in developing and managing financially sustainable information services.
2. NAADS and trained dealers working together to share demonstrations and extension responsibility in technology transfer.
3. Encouraging retired extension officers to work as input dealers and financial intermediaries between rural banks and farmers.
4. Developing financial arrangements to promote business development.
5. Providing training and technical assistance for seed production through USTA, seed growers' associations, and MAAIF. USTA can provide training to seed growers to improve the quality of seed production.

### **Implementation Arrangements**

The implementation of the action plan will require activities in several areas—seed, fertilizers, CPPs, and policy areas. Although a holistic approach is recommended for implementing core activities, it is possible

that different entities may implement some of these activities. For example, issues dealing with seed production can be implemented by an organization specializing in foundation and certified seed production, whereas capacity building for input markets can be done by another specialized organization. Nevertheless, a general coordinating oversight is needed to ensure integrity and usefulness of the action plan. It is therefore recommended that the PMA Secretariat should have the overall responsibility for the implementation of the project. With the new organizational structures of PMA and NAADS in place, PMA should coordinate the donor funding needed for the implementation of the plan.

### **Resource Requirements**

Uganda will need a 5-year program to implement the recommendations of the action plan. The preliminary estimate of the needed resources is included in Table 14. The implementation of the action plan will require US \$10 million in operating costs, US \$7 million in input import fund, and US \$1.6 million in local currency for input business development fund. In designing the project activities, special attention should be paid to implement the action plan to derive maximum benefits from the synergy of various components.

### **Government Commitment and Policy Consistency**

It is essential that the GOU in general and the MAAIF in particular continue to endorse and implement the cur-

rent policy of non-interference in the marketplace. Furthermore, it should also take the lead in creating the necessary marketing infrastructures and institutions needed for well-functioning markets. A strong commitment by the GOU should be reflected in marshaling the necessary resources to implement the action plan.

### **Donor Support**

Given the development challenge of eradicating hunger and poverty and protecting human health and the environment, Uganda's dependence on external support is unequivocal. As indicated earlier, the implementation of the action plan will also require resources and most likely resources may come from more than one donor. Under such circumstances, PMA's role becomes critical as a coordinating agency for pooling resources from several donors and organizing the implementation of the action plan. Since many donors are following a "basket approach" in Uganda to pool donor contributions for budget support, it is critical that MAAIF and PMA work with donors to secure necessary funding for the action plan. Donor support will also be crucial in sustaining the private sector-based approach to input distribution. Donors must refrain from direct distribution or involvement in input supply and even when human or strategic considerations (in case of emergency situations) demand that donors take an active role in input supply, **such well-intentioned interventions should be made in a market-friendly manner.**

**Table 14. Resource Requirements for 5-Year Programs**

Activity	Responsibility	Resources Needed
		('000 \$)
<b>A. Project Operating Costs</b>		
1. Policy Environment —Macro —Sectoral	MFPED PMA/MAAIF	500
2. Human Capital Development —Public —Private	MAAIF/NARO/PMA Autonomous Project Entity (such as IFDC/IDEA/SG 2000), Seed Growers Association, Input Dealers Association, and NGOs	5,000
3. Finance	MFPED/Bank of Uganda/PMA, Commercial Banks, Project Entity	1,000
4. MIS	Project Entity, MAAIF/Associations	1,000
5. Regulatory Systems/ Contract Enforcement	MAAIF/Project Entity/Uganda Bureau of Standards/Ministry of Justice and Consumer Affairs	1,500
6. Technology Transfer	Project Entity/NAADS, NARO, MAAIF/ NGOs/Private Sector	500
7. Output Market Development	PMA/MAAIF/Private Sector	NE <sup>a</sup>
8. Regional Integration of Markets	Market Research Council/MAAIF/EAC, NGOs, and Private Sector	500
9. Infrastructural Development	Ministry of Works, Housing, and Communication/MAAIF	NE
<b>Total</b>		<b>10,000</b>
<b>B. Capital Funds Costs</b>		
1. Agricultural Input Import Fund	Bank of Uganda/MFPED	7,000
2. Small Input Business Development Fund (in local currency)		1,600 <sup>b</sup>

a. NE = not estimated; supplementary to NAADS funds.

b. US\$ 2.8 billion @ US\$ 1,750/US \$1.

## V. Linkages with Donor and National Programs

### USAID/Uganda's Strategic Objectives and the Action Plan

The proposed action plan will contribute directly to the achievement of USAID/Uganda's Strategic Objective (SO) 7: "Expanded Sustainable Economic Opportunities for Rural Sector Growth" (Figure 8). In other words, SO-7 will assist Uganda in reducing poverty and sustaining economic growth by expanding economic opportunities and increasing employment, income and the viability of enterprises. SO-7 will be achieved through four key intermediate results (IR): Increased food security for the vulnerable (IR 7.1), increased productivity of agricultural commodity and natural resource systems (IR 7.2), greater competitiveness of enterprises (IR 7.3), and a stronger enabling environment (IR 7.4). In its IR 7.2 the SO-7 identifies increased market access and efficiency as a critical component. The SO-7 also identifies strong private-public-civil society partnerships as an essential element of the strategic approach.

Clearly, SO-7 supports the PMA and the development of an action plan to revive the agricultural sector and ensures economic empowerment of lower income farmers, especially women. The action plan contribution to IR 7.2 and IR 7.3 is direct because the main thrust of this plan is the expansion and strengthening of the private markets for the provision of agricultural inputs—fertilizer, seed, and CPPs—to Ugandan farmers. Because most of Uganda's farmers are smallholders, the main target group of beneficiaries will be the rural poor. The strengthened private sector's timely provision of these inputs at lower prices will increase land and labor productivity in farming, thus contributing to enhanced food security, economic opportunities, and agricultural development for rural households.

By making agricultural inputs such as fertilizer more available and more affordable to smallholders, the intensification of farming on land already under cultivation will be encouraged. This, in turn, will discourage the process of extensive agriculture: the practice of bringing into cultivation new plots in more fragile lands. The activity will also contribute to soil fertility by helping reduce the widespread problem of nutrient mining, thereby indirectly contributing to the sustainable management of natural resources.

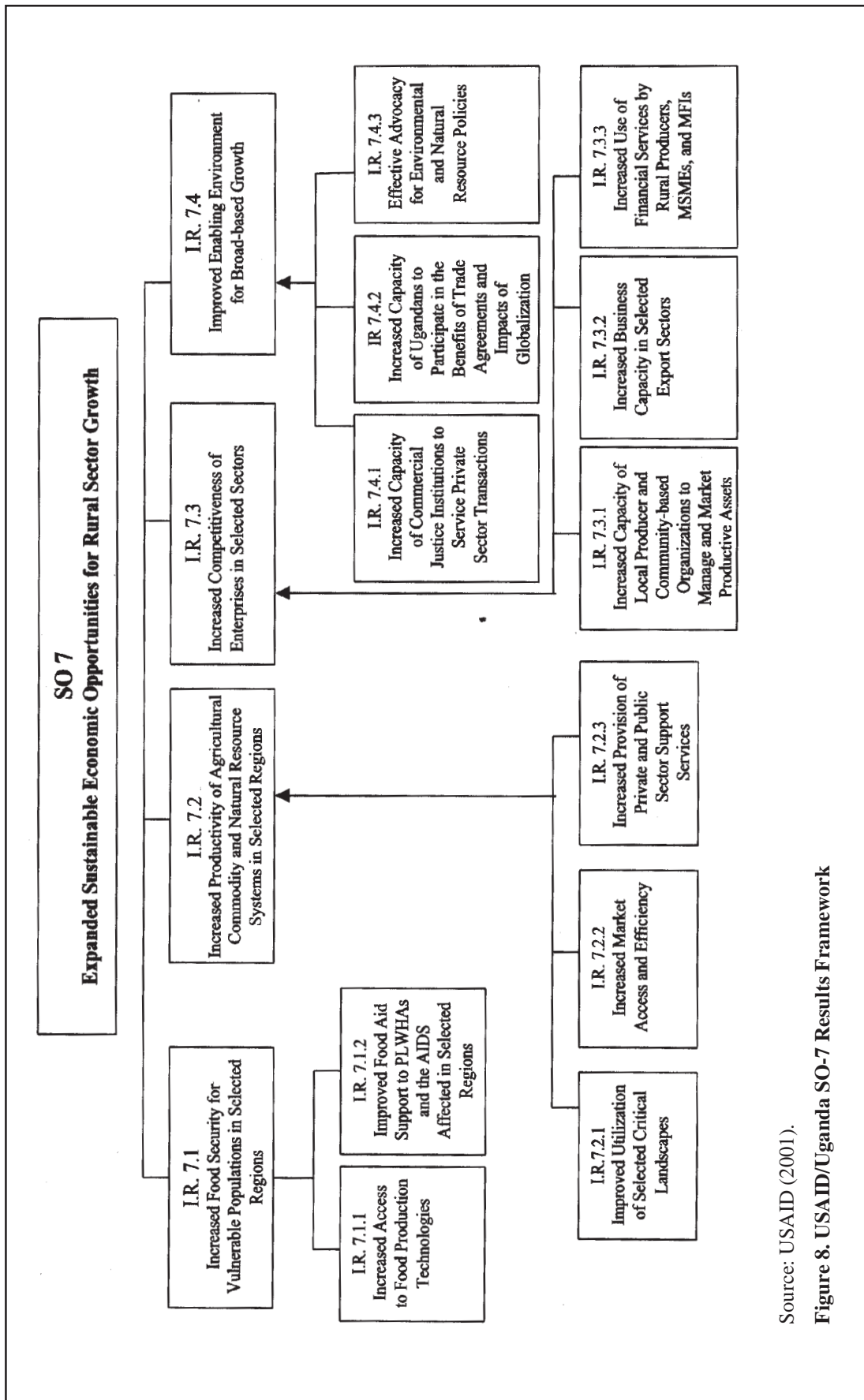
The activities proposed directly address the factors that constrain the effective participation of the Ugandan pri-

vate sector in the agricultural inputs market. By working with enterprises to provide technical and financial counseling through direct technical assistance, training programs and workshops, and linking enterprises with NGOs and other projects or initiatives involved in farmers' association development, technology transfer, and commercial banks, they will be more competitive and provide solid advice and value-added services to their clients and expand their businesses. They will also be more qualified for commercial loans needed to finance and expand their businesses. Successful trained entrepreneurs will become important change agents. As they make products available to farmers at their doorstep at competitive prices, they keep the farmers informed of the changes in agricultural technology and promote the proper and safe use of products. With proper skills and knowledge, their entrepreneurial initiative and drive create a constant search for improvement that leads to customer satisfaction. Such a cadre of strong, skillful, and knowledgeable entrepreneurs is necessary to ensure the widespread availability of agricultural inputs at convenient places and times and at competitive prices in Uganda.

### PMA and the Action Plan

As explained earlier, the GOU has prepared the PMA that provides the blueprint for developmental activities in the agricultural sector. The PMA has identified seven pillars for focused attention. One of these pillars relates to marketing and agroprocessing. However, this pillar focuses on output marketing. The issues related to input supply are not articulated in the PMA. By providing a set of actionable programs, the action plan complements the PMA efforts because without well-functioning input markets, output markets cannot be sustained. The action plan's emphasis on technology transfer will support PMA's emphasis on education, extension, and technology development. Likewise, private sector-based extension services proposed by the action plan will complement the demand-driven NAADS activities. Innovative ideas proposed to finance the development of small businesses can contribute to PMA efforts in rural finance.

The activities proposed, when considered together, constitute a holistic approach. Such an approach will simultaneously create a supportive policy environment, build human capital, improve access to finance for suppliers and users of agricultural inputs, implement effective regulatory systems, develop a market information



Source: USAID (2001).

Figure 8. USAID/Uganda SO-7 Results Framework

system, and generally strengthen agricultural technology transfer to farmers. However, the action plan recognizes the need for strong private-public-civil society partnerships to (1) develop a common agenda and to exchange information and data, and thereby operate off the same base; (2) leverage their combined resources and creativ-

ity; (2) ensure that preferences of the stakeholders are reflected in the choices and design of interventions; (4) take advantage of useful expertise and skills of all stakeholders; and (5) improve the implementation, transparency and accountability.

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