

TANZANIA SEED MULTIPLICATION

AID PROJECT IMPACT EVALUATION REPORT NO. 55
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by

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SUMMARY

Tanzania is a large and diverse nation poor in natural resources other than land. Rainfall is unpredictable in quantity and timing. Most of the population is involved in subsistence agriculture, but there is a large farm sector currently operated primarily by the state. Food security and exports of cash crops to obtain foreign exchange are current major concerns. Per capita income is among the lowest in the world.

Tanzania became independent in 1961. The seeds project, which began in 1970, was planned in 1969 and coincided with the start of the Second Five-Year Plan and a reorganization of

government, both generating much optimism. The project's purpose was to institutionalize the production and distribution of high-quality improved seeds in order to increase total food crop production and the income of small farmers.

No organized seed system was in operation at the time. The project was designed to develop the type of program found in developed nations and included plans for a stringent seeds law and implementing regulations, a testing and enforcement component, a three-stage multiplication process, and a nationwide distribution system.

Major project implementation modalities were a high level of technical assistance for production of foundation seed, development of quality measurement laboratories, and carrying out of formal and on-the-job training for persons designated to fill key positions in the program.

The strategy was to produce all foundation seed on large-scale, highly mechanized government farms with sophisticated equipment.

It was recognized that many linkages would have to be established with other institutions, and it was assumed that related institutions such as those for research, extension, and credit would be willing and able to act in concert with the seed institutions.

Most specific project objectives were achieved, the more outstanding being the following:

1. Seeds legislation and regulations were enacted and are being enforced.
2. A system for producing and distributing high-quality seeds to small and large farmers is in operation.
3. Farmers, large and small, are using the seeds and are increasing total production while improving their welfare.
4. Recipients of long-term training were well selected, performed well in training and have proven upon return to be competent and dedicated.
5. A system for establishing linkages within the seed industry is specified in laws.

On the other hand, the overall system is working far below its capacity and thus inefficiently. The fact that only four thousand tons (less than 5 percent of capacity) of certified food crop seeds were sold in 1982 provides some indication of the low level of activity.

The project suffered the following drawbacks:

1. In spite of the positive contribution of the seed program, total food crop production has declined since the early 1970s due to overall economic policies, rapid institutional change, and deterioration of the national infrastructure.
2. Related institutions for extension and credit did not perform as assumed. The seed project was not adjusted nor was any effort made to influence the performance of these institutions. As implementation of the seed program proceeded, project personnel increasingly turned their efforts inward, toward self-sufficiency.
3. The strategy of producing foundation seed on large completely mechanized farms with large and sophisticated equipment was never modified in spite of warning signs. Sustainability of the project is now threatened due to unavailability of spare parts and trained service personnel.
4. Sustainability is also threatened by the failure to institutionalize training for a second generation of personnel for the project.
5. The goal of establishing viable seed institutions was never changed and in one sense should not have been changed. The planned size and sophistication of the seed institutions, however, should have been modified and some resources devoted to other uses.

Lessons to be learned from the project are as follows:

1. Levels of mechanization should be kept to the essential minimum required and be as simple as possible.
2. The fundamental goal of establishing essential institutions on a "bare bones" basis should not be changed during the life of the project, but implementation should be modified as experience is gained from the project and as external conditions change.
3. Problems of distribution and marketing should be addressed prior to the initiation of production activities.
4. Assumptions in project design regarding requisite actions by related institutions should be carefully evaluated during the approval process and diligently pursued during implementation.
5. Project designers should be cautious in relying upon related institutions to perform assorted services, e.g., the extension service will "sell" farmers on using good seed. Such institutions may have different agendas and priorities than are frequently assumed in project design.
6. When a project is planned for an economy with strong public sector control, it should be realized that free market mechanisms such as price will not be able to perform the coordinative and allocative functions they perform in a market economy. Project design must be adjusted accordingly.

7. Exaggerated claims for potential project impacts may create initial enthusiasm but, over the long run, will hurt project credibility and sustainability.
8. Where critical institutional and infrastructure support systems are weak, or missing, project personnel should take special care to compensate in design and implementation plans.

ACKNOWLEDGMENTS

The team received gracious assistance in its work from Tanzanian officials and the USAID Mission to Tanzania. This assistance facilitated the evaluation and made working and living conditions pleasant.

The Mission provided the team with the relevant materials and suggested names of persons who should be contacted for first-hand information. Travel arrangements were made and transportation provided by the Mission under very difficult conditions. Mr. Adolph Kapinga, an economist with the Mission, was assigned to work full time with the team.

Officials in the Ministry of Agriculture, various parastatals, and the Sokoine University were generous with their time and candid in their remarks. Special thanks are due to Mr. Michael Mashelle and Mr. Ralph Mizambwa of the Division of Extension and Technical Services, Ministry of Agriculture, who contributed significantly to making the field work productive.

PROJECT DATA SHEET

1. Country: Tanzania
2. Project Title: Seed Multiplication
(Original -- Seed Multiplication and Distribution)
3. Project Number: 621-0092
4. Project Implementation:
 - a. Project Paper: November 1969 (Revised six times with principal amendments in 1973, 1977, and 1980)
 - b. Project Authorized: January 1970 (original)
 - c. Project Agreement: May 1970 (original)
 - d. Final Obligation: FY 1980
 - e. Final Input Delivered: December 1982
 - f. Final Disbursement: December 1982

5. Project Funding:

a. AID	\$ 6,854,000
b. Government of Tanzania	\$ 7,653,000
Total	\$14,507,000

Notes: (1) AID total does not include commodities (farm and irrigation equipment) purchased under Agricultural Support loans (015,016, and 017) totaling \$1.72 million.

(2) Government of Tanzania-owned counterpart generations under PL 480 Title I sales were allocated as budget support to the seed program until 1980. Firm data are not available for this period. Since 1980 counterpart has been allocated to support local purchases of equipment.

(3) Government of Tanzania funding is as presented in 1980 Project Paper amendment.

(4) Host Country Exchange Rates:

(a) Name of Currency: Tanzanian Shilling (T.Sh.)

(b) Exchange Rate at Time of Project:
T.Sh. varied from 7.14 to 9.69 = U.S.\$1.00

6. Mode of Implementation:

a. Project Agreement between USAID/Tanzania and the Government of Tanzania.

b. AID financed contract with the Experience, Inc. (AID/afr.-752 and AID-afr.-1175). Collateral support provided through centrally funded activities by Mississippi State University, Oregon State University, and the University of Missouri.

7. Evaluations:

a. Regular Evaluations:

PAR 74-2 dated June 1974
PAR 75-1 dated February 1975
PAR 76-2 dated March 1976
PAR 77-1 dated March 1977
PAR 78-4 dated May 1978
PES 80-1 dated February 1980

b. Special Evaluations:

Tanzania Seed Industry Survey
(Work Order No. 7 Contract AID/Afr.C-1139,
April 1979)

8. Responsible Mission Officials During Life of Project:

- a. Mission Directors: Charles J. Nelson, William D. Green, Vernon C. Johnson, Richard L Podol (Acting), Howard L. Steverson, James E. Williams (Acting), Barry M. Riley (Acting), Arthur M. Handly
- b. Agricultural Development Officers: Oleen Hess, Jack Cornelius, Paul Russel (Acting), Peter Shirk (Acting), Michael Fuchs-Carsch, Joseph Goodwin, Kenneth Lyvers
- c. Project Officers: Jack Cornelius, Henry C. Wiggin, Staley Pitts, William Jadwin, Peter Shirk, Burt Behrens, Ronald Harvey

9. Tanzanian Government Officials During Life of Project:

- a. Project Director/Coordinator: Michael Mashelle
- b. Assistant Coordinator: Ernest G. Mosha, Ralph C. Mizambwa
- c. Director of Agricultural Extension and Technical Services: C.Y. Mpupua, Salim Khamisi

GLOSSARY

Abbreviations/Acronyms

ARI	-	Agricultural Research Institute
CDC	-	Commonwealth Development Corporation
GOT	-	Government of Tanzania
IDRC	-	International Development Research Center
MATI	-	Ministry of Agriculture Training Institute
MOA	-	Ministry of Agriculture
NAFCO	-	National Agricultural and Food Corporation
NMC	-	National Milling Corporation
PMO	-	Prime Minister's Office
TanSeed	-	Tanzania Seed Company

- TanWatt - Tanganyika Wattle Company
- TARO - Tanzania Agricultural Research Organization
- TFA - Tanganyika Farmers Association
- TOSCA - Tanzania Official Seed Certification Agency
- TRDB - Tanzania Rural Development Bank
- USAID - United States Agency for International Development
- USAID/T - United States Agency for International Development Mission to Tanzania

Definitions

- Breeder seed** - Seed of a variety produced or developed by a plant breeder under conditions which have ensured that the special characteristics of the variety have been maintained and which provide the source for the initial and recurrent increases of seed of the pedigreed grades; or if of foreign origin, that the seed is certified by a recognized certification agency as being of breeder's grade.
- Certified seed** - The approved progeny of breeder or foundation seed managed to maintain satisfactory genetic identity and purity, the production of which is supervised and approved by the Tanzania Official Seed Certification Agency which provides the source for the initial and recurring increase of seeds; or if of foreign origin, that the seed is certified by a recognized certification agency.
- Composite seed** - Composites are open-pollinated varieties selected from the random combination of a large number of recognized breeding lines that in theory have good combining quality and genetic characteristics desired for a specific location.
- Contract growers** - These are individual farmers, cooperatives, parastatal organizations, or seed farms which contract with TanSeed to grow certified seed.
- Foundation seed** - The approved progeny of breeder seed

produced by seed growers (Foundation Seed Farms) authorized by the Tanzania Official Seed Certification Agency for production of this grade and which have been managed so as to maintain genetic purity and identity which provides a source for the initial and recurring increase of seeds; or if of foreign origin the seed is certified by a recognized certification agency as being of foundation grade.

- Hybrid seed - A single, double, or triple cross of selected inbred lines, normally with wide variability in genetic background, that attempts to enhance certain predetermined characteristics such as yield, insect or disease resistance, stalk strength, etc., and attain hybrid vigor or heterosis.
- Hybrid single cross - Seed obtained by crossing two unrelated homozygous strains to obtain uniform and enhanced trait expression of the first generation.
- Hybrid double cross - Seed obtained by crossing four unrelated homozygous strains or two unrelated single cross hybrids to obtain uniform and enhanced trait expression in the first generation heterozygote.
- Hybrid three-way cross - Seed obtained by crossing three unrelated homozygous strains to obtain uniform and enhanced trait expression in the first generation heterozygote.
- Inbred line - Seed derived from a relatively homogeneous line produced by inbreeding and selection.
- Parastatal - An institution totally or partially owned by the government, which operates with some autonomy from the government but reaucracy.
- Seed multiplication - The process used for increasing the breeder seed in the quantity required while maintaining the original genetic characteristics.

I. THE PROJECT SETTING

Tanganyika was granted independence in 1961. Julius K.

Nyerere was elected President. In 1964 Tanganyika merged with Zanzibar to become Tanzania. In his inaugural address Nyerere spelled out the type of economic system that he intended to put into effect. He had evolved a variation of socialism that he believed was ideal for Tanzania (see Appendix C).

Tanzania is poorly endowed with natural resources except for land, which is relatively fertile by tropical standards. Rainfall is bimodal with the "long rains" coming between February and May and the "short rains" in November and December. Variability in timing and volume is extreme.

The country has very diverse agro-ecological zones, relating largely to elevation, soil type and rainfall. In very general terms, four major zones can be delineated: (1) the hot and humid coastal plains, (2) the hot arid zones of the central plateau, (3) the high moist lake regions, and (4) the temperate highland areas. This variation permits production of a wide variety of crops but it also poses problems in that research, extension, input delivery and marketing programs must be adjusted to meet the requirements of each zone.

At independence Tanzania was primarily an agricultural country. Little has changed. According to the 1960 census, the agricultural sector accounted for 90 percent of total employment and 40 percent of wage earnings. It generated about 85 percent of all export earnings but contributed only 40 per cent of the GDP.

Trained manpower was extremely limited, with only 77 university-trained nationals. None was trained in agriculture. Insufficient trained manpower continues to be a major constraint on the agriculture sector.

There were two distinct farming systems at independence. The majority of farmers practiced subsistence agriculture using traditional methods. A second system involved large-scale commercial farming of cash crops--sisal, coffee, tea, cotton, wheat, tobacco, cashews, and pyrethrum. These large farms used only 1 percent of the land but generated 40 percent of the exports. This dual system has continued to this date.

Ownership of most of the large farms, however, has been transferred to the Government and they are now operated by several parastatals. Limited large-scale private farming continues, but its existence is threatened in a number of ways.

When the Seed Multiplication and Distribution Project was being planned in 1969, small farms were beginning to increase marketable production of both food and cash crops. It seemed clear that this trend would continue due to increased commercialization of the traditional farming sector and falling production on the large-scale farms. The project was designed to play a major role in accelerating small-farm production.

The project was designed in the context of initiation of

Tanzania's Second Five-Year Plan. This and subsequent plans were strongly influenced by the Arusha Declaration of January 1967 (see Appendix C), which stated that Government policy and programs would be based on a socialist model of development stressing public ownership and control, equity, and self-sufficiency.

The Second Five-Year Plan directed particular attention to disparities between incomes in agriculture and other sectors and called for rapid development of agriculture in order to correct this inequity. Substantially increased rural investments were planned. Great disparity in social services was also noted and rural development was made a high priority with major investments planned, particularly in education, water supply, and health.

The principal policy mechanism for correcting inequity in income and services was "villagization." In a relatively short time span in the early 1970s, most farmers were moved into villages. Government adopted a decentralized administrative structure with regions and districts being given primary responsibility for planning and implementation of development activities. The village became the basic economic and social unit for the country's development. The village unit was, in theory at least, made responsible for planning and executing agricultural and rural development plans, with advice and direction from district and regional offices. Concurrent with the village-based program, farm supply and marketing cooperatives were abolished in 1975 and their functions turned over to the villages. Also, extension workers were transferred from the Ministry of Agriculture and assigned to parastatals and to the regional and district offices responsible to the Prime Ministers's office. Responsibility for providing farm inputs and marketing services was assumed by newly established parastatals.

Tanzania entered the Second Five-Year Plan with heady optimism, justified by performance since independence and anticipated benefits from changes in organization and structure. It was in this context that the project was launched in 1970. Specific problems the project was designed to address were inadequate food security from domestic sources, inadequate agricultural raw materials for industry, and a critical shortage of agriculturally derived foreign exchange.

II. PROJECT DESCRIPTION

The general purpose of the project was to improve the quality and increase the quantity of improved seed for Tanzania. This was to be achieved by building seeds institutions.

A single type seed program is accepted throughout the world. Its components are (a) research to develop seeds that lead to improved crop performance, (b) a staged multiplication

process from production of breeder seeds (research product) to foundation seeds to certified seeds that faithfully reproduce the qualities of the breeder seeds, and (c) a distribution system that gets the seeds to farmers. Two complementary institutions required to make such a program work are (a) a national seed law that sets forth rules governing seed production and distribution and provides authority to enforce these regulations and (b) laboratories for testing and ensuring quality at every stage of the process.

The Government of Tanzania (GOT), with assistance from USAID, committed itself in 1970 to establishing a seed program as outlined above. The project was to concentrate on three components in its first 5-10 years: (a) developing and adopting a seeds act and regulations, (b) developing a seed multiplication program, and (c) developing a seed company responsible for distribution of seeds.

The ultimate goal of these activities, as stated in the 1970 project paper, was "to double cereal and food legume production in Tanzania and go beyond self-sufficiency to surplus production for export during the ten year life of the project."

The major project activities planned for the first 5 years are briefly described in the following paragraphs. Experience Incorporated was selected as the AID contractor to assist the Tanzanians in implementing these activities.

A. Seeds Act and Regulations

The objective of this component of the project was to assist Tanzania to develop a "sound" seeds act including implementing regulations.

B. Seed Multiplication

The component had two objectives: (1) to develop two foundation seed farms, one in a high-altitude zone and a second in a low-altitude zone; and (2) to develop five farms to produce certified seed, each in a different agro-ecological zone. Each farm was to be large (at least 400 hectares), self-contained, practice highly mechanized production, and be fully equipped with seed handling, drying and storage facilities. These farms were to be operated by the Ministry of Agriculture. Initial crops/seeds to be multiplied were maize, rice, sorghums, millets, food legumes, and wheat. Most USAID project funds for technical assistance, training, and commodities were allocated to this component.

C. Seed Distribution

The objective of this component was to develop a joint Tanzanian Government/private entity to distribute seeds nation wide. A very broad role was envisioned but was not explicitly spelled out in project documentation. AID assistance to the distribution system was to be limited to minimal technical assistance, primarily from the contractor's project director.

D. Technical Assistance and Training

The original design (1970) called for 66 person years of long-term technical advisory services as well as short-term consulting. While most were to be used directly on the seed farms, provision was made for limited technical assistance to the Extension, Research, and Entomology and Pathology Plant Protection units of the Ministry of Agriculture (MOA).

In addition, 32 person years of participant training in the United States was called for, mostly leading to the B.S. degree. Short-term training was also prescribed, primarily in farm mechanics or seed testing. The majority of the training was designed to provide manpower which would operate the seed farms after project assistance was completed.

E. Project Implementation

The above plan for USAID assistance, in particular technical assistance and training, was closely adhered to. The project was amended substantively in June 1973. As revised, the project called for four foundation seed farms and no certified seed farms. All project responsibility for seed distribution was dropped.

Life of project funding was again extended by USAID in January 1978. While enthusiasm continued to be expressed in the Project Paper amendment concerning the potential of the project, the tone was less idealistic. Its more moderate goal was "to assist Tanzania achieve self-sufficiency in the food crops subsector."

The expected outputs set forth in the 1978 extension were as follows:

1. three functioning foundation seed farms with a fourth under development;
2. foundation seed production adequate for national needs;
3. seeds act and regulations competently enforced;
4. Tanzania Seed Company operating nationally with appropriate seeds and equipment;

5. seed testing/certification laboratory established and operating effectively;
6. seed certification program completely implemented;
7. seed multiplication program staffed and managed by Tanzanians;
8. Tanzanians trained to operate the seed certification system;
9. an improved research system and seed multiplication and distribution system on Zanzibar; and
10. an operational plan underway for procuring spare parts and replacement equipment.

This revised plan continued to rely heavily on U.S. technical assistance (28 person years). All except 1.3 person years involved long-term personnel working directly on the seed farms. Overseas training (in the United States) continued to be emphasized with 14 individuals scheduled to obtain B.S. degrees, 9 to achieve M.S. degrees, and 5 to receive short-term training.

This second phase (1978-1982) progressed as planned with the following exceptions. After a year's effort failed to establish the feasibility for a seeds program in Zanzibar, this project element was dropped. Following an official U.S. visit by President Nyerere in 1977, the issue of six additional seed farms was raised. However, an outside team of U.S. seed industry experts subsequently recommended against such action. In 1980, following a detailed soil analysis and after 4 years of bad production experience, the fourth seed farm site was dropped.

In spite of many instances of inability to secure fertilizers, chemicals, and parts when needed, the basic project strategy of employing large-scale, highly mechanized, high technology production on the seed farms never changed. Instead, plans called for funding and maintaining an inventory of supplies, including spare parts, to meet anticipated maintenance needs.

The contract with Experience Incorporated was completed as scheduled in December 1981 with the departure of the last three technical personnel. USAID/T extended the project through 1982 to complete participant training in the United States, development of the Dabaga Seed Farm infrastructure and the buildup of the parts inventory.

III. PROJECT IMPACTS

The project was by design limited in scope, and its components are finite and easily measured. It is sound agricultural development strategy to emphasize seeds because (1)

they are an essential farm input, (2) they are inexpensive (per unit) relative to other inputs, (3) they package very sophisticated research in an immediately usable form, and (4) they often encourage the adoption of other crop production technologies.

A. Building Seed Institutions

When USAID financial assistance was terminated, the essential seed institutions called for in project documentation were operating. Thus, the immediate objective of the project has been achieved.

1. Seeds Law and Enforcement

A national seeds law was enacted and regulations were written. These are being enforced by the GOT for the major food crops. Several evaluations have questioned whether the law establishes unduly high standards for the Tanzanian situation.

The top officials responsible for this program component received long-term training appropriate for their duties and have considerable tenure in their positions. Performance of official duties is satisfactory but is severely restricted by the lack of transportation, communication, and distribution -- constraints which affect every aspect of Tanzanian life.

The Tanzania Official Seed Certification Agency (TOSCA) was created within the MOA and was given responsibility for guaranteeing quality control through enforcement of the seed law and regulations. Its main operations are a field inspection service and laboratory testing. Field inspectors have the requisite training and supervision but are seriously hampered by transportation problems.

2. Foundation Seed Farms

Three seed farms are operating and, with the exception of foundation seed for hybrid maize, are producing all the foundation seed required by TanSeed. The Commonwealth Development Corporation (CDC)-supported parastatal that is the major distributor of food crop seeds. Responsibility for maintaining inbred hybrid maize lines was assigned to TanWatt, a CDC-supported parastatal, rather than the project-supported seed farms.

The seed farms have capacity well beyond current requirements and are producing certified seed as well as foundation seed. This is a sound use of excess capacity. The seed farm managers, assistant managers, and agro-mechanics have appropriate training, have several years of on-the-job experience and are dedicated to their work. According to the

accounting system used, the farms are paying their own way; however, it should be noted that the accounting system makes no provisions for either loan amortization or equipment depreciation.

From an equipment maintenance perspective, however, disaster looms on the horizon. All seed farms were equipped with state-of-the-art equipment which necessitates continual acquisition of parts and supplies. The state of the Tanzanian economy makes such purchases extremely difficult. When a piece of equipment fails, it generally sits idle. It is only a matter of time, therefore, until most pieces will be inoperable.

The team believes that the concept of large-scale, mechanized farms was never adequately thought through. It is our conclusion that a mechanized approach is basically sound because it improves quality control and makes efficient use of highly trained manpower. A different plan for mechanization should have been used, however. The equipment should have been smaller and less sophisticated. The majority of the seed handling and drying equipment on all except one farm has only briefly, if ever, worked and yet seeds are being produced satisfactorily. A similar situation exists in the seed laboratories. The bid specifications should have called for using, where possible, in-country equipment distributors with service capability. This would have helped ensure that equipment worked on delivery and that repairs could be made in a reasonable time. The results of not following this course of action are illustrated by the arrival of a new corn picker that did not work and for which it took 2 years to get an operator's manual. A new plow arrived with a broken hydraulic hose, and was still unused 2 years later. In addition to purchasing equipment in-country, to the extent possible, all personnel should have been conditioned not to be totally dependent on parts from the United States. Many parts are interchangeable between brands and some truck parts work on farm equipment. It should be possible to have simple pieces fabricated locally, and such a capability should have been encouraged if it did not exist.

3. Distribution System

The importance of a system for distributing seeds to farmers was recognized from the beginning but basically no project support was given to this activity, for reasons never clearly stated. The GOT created TanSeed, a parastatal started with GOT and CDC funds, and made it the exclusive distributor of major food crop seeds. TanSeed has built seed cleaning, processing, and packaging facilities, has found contract growers to produce certified seed (the foundation farms are major contractors), and has a system for distribution to farmers that is working about as well as other systems in the country. In keeping with the GOT policy on equity, TanSeed is attempting to distribute seed to all regions and all types of farmers at the same price.

Delivery of seed is often late, frequently supply and demand do not coincide, and costs are very high. Currently the marketing margin is about 300 percent which makes seeds -- which are not subsidized -- very expensive for farmers. A remarkably good job of maintaining quality is being done under very difficult conditions. The high cost is due partially to the equity considerations included in GOT's territorial pricing and distribution policy.

Physical distribution problems are difficult for many reasons and have been intensified by frequent institutional changes. At first local cooperatives were to be the primary distributors. Then it was villages. Then the primary distribution units were serviced by several supply and marketing parastatals. Current plans are to use local cooperatives once again. In addition, regional and district offices of the Prime Minister have played roles ranging from buying and distributing TanSeed products to producing their own seed. While TanSeed has problems with machinery and equipment, these are less severe than on the farms and laboratories.

A good system for estimating effective annual demand for seed has not been developed and this has resulted in an excess production of seed. This has added significantly to costs. The system that has been used is to have District and Regional Development Offices submit estimated requirements. These estimates often reflect aspirations rather than precise needs. TanSeed will have to learn through experience how to make more precise the estimates it receives.

TanSeed has undertaken very little marketing promotion, assuming either that the product needed no selling or that this would be done by extension agents. Within the last year limited promotion activities have been undertaken, including some radio advertising.

4. Research

The seed project recognized that the success of the seed program depended on the existence of a strong food crops research program. Though not a component of the project, it should be noted that USAID and other donor programs provided support for such research through parallel assistance to various agricultural research programs throughout the life of the project.

Coordination and direction of crop research is the responsibility of the Tanzania Agricultural Research Organization (TARO), a parastatal under the Ministry of Agriculture. Research is conducted through seven agricultural research institutes (ARIs) that are located in different agro-ecological regions. Each ARI has a discrete, crop-specific mission.

The quantity and quality of Tanzania's agricultural research program have been frequently criticized. In response

to some of these criticisms, the GOT established TARO in 1981. Undoubtedly much of the criticism is justified. The fact remains that a functioning research program for basic food crops is operating reasonably well in spite of the many constraints imposed by the economy. A staff of young scientists has been trained and is working with dedication. Results are being accomplished, including new crop varieties. Productive linkages have been made with international research programs and organizations, and research priorities are being established and coordinated.

5. Extension

In the project design, it was assumed that the MOA extension service would play a major role in promoting among small farmers the benefits of using improved seed varieties. This has not happened. Extension effectiveness has been constrained by the adverse economic conditions and budgetary constraints affecting all GOT programs. It has also been affected by institutional changes.

Agricultural extension was exclusively an MOA responsibility when the project started. About midway through the project, the extension service was divided, part being placed under the Prime Minister's Office (PMO) and the rest assigned to crop parastatals. Extension personnel assigned to the PMO were given a wide variety of duties, including enforcement of Government policies. Those assigned to parastatals concentrated on the narrow concerns of these crop-specific parastatals. As a result of this confusing division, extension service morale and effectiveness declined substantially. We note parenthetically a favorable development -- extension services are once again to be reorganized with full responsibility for directing activities given to the Directorate of Extension and Technical Services in the MOA.

A major flaw in the project design, therefore, was the assumption that the extension service would be a primary vehicle for getting farmers to use improved seeds. The link between production of new seeds and their use by farmers was very weak at the time of project design and continues to be so.

B. Agricultural Production

Ambitious goals for increased production were set forth in project design documents. Current reports on the subject claim that food production per capita has declined since the late 1970s, although such an assessment is complicated by lack of reliable statistics, the growth of sales through parallel markets, an increase in on-farm consumption, and leakage across borders. Nonetheless, the actual performance of the food sector, in contrast to what was expected, does not mean that the seed program was a failure. It does illustrate, however, a case in which the success of a specific and limited-scope project was dependent on a range of related and supportive programs and activities. Further, it demonstrates that unfavorable economic

policies and too rapid a change in rural institutions can limit the impact of a "successful" project.

USAID, World Bank, and GOT documents cite a long list of reasons for the poor performance of the agricultural sector. The more prominent are (1) pricing policies unfavorable to farmers, (2) inappropriate marketing policies, (3) lack of infrastructure, (4) excessive reliance on the public sector, (5) too rapid institutional change, and (6) inadequate investment in agricultural transport and marketing. Important external constraints are the world oil situation, droughts, the war with Uganda, the depressed world economy, the breakup of the East African Community, and the weakening of the world commodity markets. Indeed, these conditions have had unfavorable impacts on all Tanzanian institutions.

In spite of these unfavorable conditions, the seed program has had a positive impact on the farm economy. In 1982 TanSeed sold 5,380 mt of certified seed. These seeds should have been sufficient to plant approximately 500,000 acres. For all seeds except those for hybrid maize, farmers can replant certified seed for 2 to 4 years without serious loss of basic genetic characteristics. Presumably many farmers have used their improved seeds in this manner and have shared them with neighbors.{1}

Worldwide experience indicates that improved seed alone can increase yields over traditional varieties by 10 to 20 percent. This is the experience in Tanzania according to a recent analysis by USAID/T of the results of selected agronomic research in Tanzania. Worldwide experience also indicates that an investment in high-quality, expensive seeds often motivates the adoption of a technology package which doubles or triples production. Again this seems to be the case in Tanzania. If these assumptions are correct, the seed program has probably had a significant impact.

It is interesting to speculate on possible results of the project had conditions been more favorable for agricultural production. Data do not permit development of a demand schedule, but limited evidence supports the belief that demand is inelastic. Also, there have been few market surveys to provide an indication of farmers attitudes and preferences concerning seed.

There are indications that large farmers appreciate and will buy quality seed. Following the breakup of the East African Community a decision was made not to produce hybrid maize. The subsequent outcry from growers, plus substantial smuggling of hybrids across borders, led to a reversal of this decision. A second bit of evidence comes from the Tanganyika Farmers Association (TFA), a cooperative whose roots predate independence, which serves large farmers in the most productive areas of the country. This organization serves as a distributor for TanSeed and continues to enjoy good sales of seed.

The situation with regard to small farmers is more com

plex. Small and traditional farmers operate in the context of collective village decision-making. Villages collectively decide whether to purchase seed and how to allocate them to farmers. Little useful data exist on how this process operates and with what effects.

In spite of the problem of assessing the extent to which channeling seeds through villages limits or encourages adoption, the team believes there is enough qualitative evidence to conclude that were quality seed available when needed, many farmers, including small farmers, would purchase seed were it offered at a "reasonable" price. Those farmers who intend to produce only for home consumption probably would not buy seed because of their adverse reaction to risk. For a substantial number of farmers with a market orientation, however, there is genuine interest in improved seeds. This was a valid assumption at the time of project design and continues to hold to date. The limited acceptance of seeds by farmers is due more to the high price of seeds, lack of timely delivery of seeds, low official producer prices for crops sold, and so on, and not to any fundamental resistance to use of improved seeds.

{1} A major weakness of this evaluation stems from the team's inability to obtain comprehensive data at the farm level on the use of certified seed. This was due to the fact that seeds find their way to farmers through a variety of mechanisms, not all of which are easily traced. Moreover, users of the seeds are located over a wide geographical area encompassing differing agro-ecological settings. Credible data on the extent and nature of use of certified seeds was simply not available. Nor, in the time available, could meaningful data have been obtained by a field survey, given the characteristics of the population that would have had to be surveyed. Instead the team relied on the observations of knowledgeable officials for information on farmers' use of seeds.

C. Manpower

Formal advanced training in the United States and on-the-job training by counterparts were a major component of the project. This component deserves the highest rating. A total of 45 people received training in the United States, 22 at the B.S. level, 3 at the M.S. level, and 20 for nondegree training ranging from 2 to 9 months. The short-term training was primarily in farm mechanics or seed technology. The fact that all except one of the degree candidates completed degrees, each from a first-rate university, speaks for the selection process. All of the trainees returned to Tanzania and, at least initially, went to work in some phase of the seed program.

Much of the technical assistance was used to provide on-the-job training. There was a U.S. counterpart farm manager and agro-mechanic at the four farms for extended periods of time, and the seed laboratories were provided with short-term consultants. It is a tribute to the project design and

implementation that it was recognized that academic training does not fully qualify a person to actually manage a farm or repair equipment under field conditions. The performance of the present staff indicates that the on the job training was well done. It is an even greater tribute that only 3 of the 45 trainees have since disassociated themselves from the seed project or related projects in parastatals and the Ministry of Agriculture. The training provided by the project has thus proven a valuable national resource. It will clearly provide benefits to the seed industry, the agricultural sector, and Tanzanian society at large for years to come.

One serious concern for the future exists, however. There is apparently no formal or on-the-job training being offered to produce the next generation of managers and/or technical personnel. This has serious implications for the long-term sustainability of the project.

D. Impact on Other Seed Production Systems

No organized means of providing improved seed to small farmers for basic food crops existed when the project began. Each cash crop parastatal handled seed for its own crop either through an in-house production program and/or imports. TFA had a local seed production program and also imported seed. TFA policies limited membership to farmers with 10 acres or more (most were considerably larger) and confined distribution to those geographic areas where many of its members operated. Thus, it reached a limited number of farmers. Large private estates depended upon imported seed and selective reuse of farm-produced seed. Large-scale state farms that produced food crops apparently had no organized seed procurement program. In addition, a very limited quantity of vegetable and flower seeds was shipped in by European trading firms.

The USAID-assisted seed program entered a vacuum with respect to development, production, and distribution of improved varieties of crop seed for the small farmer. The system that was developed continues to be one of the few in existence with a focus on food crops for both small- and large-scale farms. Regional Development Directors were given wide authority under the decentralization plan of 1972. Five regions have established seed farms. Questions are frequently raised about their quality, their impact on TanSeed, and the legitimacy of their existence. The reason given for their creation is that TanSeed seed was unavailable in the area in which these "illegitimate" farms have been established. At any rate, their impact has been minor and their continued existence is in doubt.

TFA was forced out of seed production activities and now serves only as a distributor of seeds. This restriction on the role of TFA resulted from GOT attempts to emphasize the public over the private sector and in no way reflected the GOT position on the USAID-assisted seed program. In fact, TFA's willingness to act as a distributor of seeds was one factor permitting it to

continue to exist as a private sector cooperative. Finally, it should be noted that foreign exchange constraints keep even the largest private farmers from obtaining seed abroad.

Consistent with its socialist orientation, the GOT has not evidenced interest in seeing a private sector seed system develop. Proposals to turn over all program functions except breeding and enforcement to an existing parastatal (TanSeed), or some other parastatal, are under active discussion. Also being considered is a proposal to invite TFA to become a partner with TanSeed and incorporate under this partnership ownership of several of the best foundation seed farms. Implementation of any such reorganization is presently hampered by the deteriorating economic situation.

E. Linkage Within the Seed Industry

The project design called for several types of seed institutions. Breeding and production of breeder seed was to be the responsibility of the agricultural research institutes. These were under the MOA at the time the project began but have subsequently become part of an overall research parastatal, the Tanzania Agricultural Research Organization (TARO) that reports to the MOA. The foundation seed farms and enforcement agency (TOSCA) continue under the MOA. The distributor (TanSeed) is a parastatal under joint ownership of the National Agricultural and Food Corporation (NAFCO) and CDC. This division of responsibility among seed institutions follows a pattern common throughout the world based on the assumption that specialization is necessary to maintain quality control throughout the system.

The necessity of ensuring linkages between seed institutions was recognized in the Seeds Act of 1973. It called for a Seeds Production Committee to be appointed by the MOA. This Committee gives advice on all aspects of the seed program and is the final authority on which seeds are to be produced and certified for distribution. Committee membership draws from all components of the seed industry, the Sokoine University, regional authorities, extension services, research institutes, and even consumers (represented by the Food and Nutrition Institute). This Committee has actively assumed its responsibilities. Given communication and transportation constraints, linkages between various seed institutions is remarkably effective. The team noted that substantial communication, cooperation, and mutual respect exist among the institutions.

F. Relationship of Seed Institutions With Other Agricultural Agencies

Seeds, in spite of their productive potential, are a minor input in the agricultural sector and a very small component of the total economy, in both developed and developing countries. This implies that the seed programs and institutions must adjust

to larger agricultural policies and agencies, not the reverse. It also means that a seed program must pursue linkages with other institutions and in selling its product. The importance of this does not appear to have been sufficiently recognized in the project.

The project implementation plan called for minimal input to or liaison with other institutions. Though MOA and USAID/T knew that USAID and other donors were supporting directly related research, this was never formally acknowledged in the Project Paper and amendments. Two years of technical assistance and 5 years of counterpart services from the MOA were devoted to developing an extension program for seeds; then the effort was terminated before improved seeds were available for distribution. The original Project Paper also called for an unspecified amount of assistance to a seed distribution effort. Funds were not provided, however, and the distribution component was dropped from the proposal entirely in the first Project Paper revision in 1973.

Actions taken relative to other institutions indicate, therefore, that persons working with the seed program failed to realize how crucial the performance of related institutions was to the successful achievement of the seed project goals. It was evident by 1975 that such complementary institutions were not performing as it had been assumed they would. The key questions, therefore, are: (1) did the seed program devote sufficient effort to making other institutions aware of its role, and (2) did the seed program make adjustments when other institutions and policies did not perform as expected?

The team believes that insufficient effort was devoted to enabling other institutions to make full use of the seed program. This was partially due to an implicit but unstated assumption in project documents that good seed needed no selling.

Project personnel also did not view seed from the same perspective as did either farmers or related institutions; that is, as one element in a broad/integrated package of inputs and services. This bias was also reflected in the technical assistance provided and in overseas training. Personnel were very well trained in seed technology, but we found no evidence of technical expertise or training in seed marketing or distribution. Training also failed to include management training, particularly in how to relate to and influence the behavior of related institutions. The rationale for limiting technical services and training exclusively to seed technology is not clear. One bright spot, however, was the establishment of effective links with GOT research facilities for carrying out varietal research.

The extension service could have been encouraged to do more on seeds, regardless of its organizational status, if someone had provided narrative and visual materials, seed samples for demonstrations, and recognition for outstanding work on seeds. No element of the seed program, including TanSeed, felt that it had such responsibility, however.

With regard to the question of the seed program making adjustments in light of the actions (or lack of action) of other institutions, one distinctive feature of the project was that it followed very closely the original plan and achieved almost all of the Output and Purpose end-of-project indicators. The team questions whether this was the best course of action. The core objective of establishing viable seed institutions should have been (and was) consistently pursued, but there should have been adjustments in goals and implementation strategy. For example, it should have been clear by midway through the project that the seed farms had more capacity for producing foundation seeds than would be needed for the foreseeable future. Indeed, the contractor indicated in its final report that the farms had the capacity to produce 97 thousand tons of certified foundation sorghum, maize, and wheat seeds (20 times the amount used in 1982). It also should have been clear that securing adequate parts for the type of equipment imported would pose problems regardless of availability of foreign exchange. Some modification of approach should have been possible without significantly affecting the functioning of the basic seed institutions.

By 1977 there was ample evidence that related GOT institutions were not performing as has been assumed in the project design and that good seeds would not automatically "sell" them selves. There were opportunities to amend implementation strategies, particularly in the 1977 and 1980 revisions. It might have been possible to change the perspective and attitude of personnel assigned to the project without changing any documentation. Such a course of action was recommended in the 1975 evaluation and the 1979 Seed Industry Survey. USAID/T also had an opportunity to foster linkages and to support the seed program through other projects it was operating or developing.

IV. CONCLUSIONS

Institutions necessary to produce and distribute high-quality seeds have been created and are operating, generally more effectively than many other Tanzanian institutions. Most end-of-project indicators have been met. However, the sustainability of the institutions established is in question due to problems of obtaining essential spare parts and supplies for farm and laboratory equipment. When purchased, this equipment was U.S. state-of-the-art. The very long overseas supply line intensifies the difficulty of obtaining supplies and replacement parts.

The seed program has made a positive contribution toward achievement of the goals of increased total production and increased income for small farms, but the results fall far short of the goals stated in project documents. This achievement is not reflected in either total agricultural production or farmers' real income, which most published data indicate have declined. The situation would have been worse without the seed program. In retrospect, however, the anticipated impact of the project was unduly optimistic. Moreover, the influence of

factors outside the scope of the seed program which nonetheless have influenced its impact was largely ignored or greatly discounted during implementation.

Manpower training, which combined formal and on-the-job approaches, was of high quality and produced a valuable resource for the country. One atypical feature of this training is the fact that persons returning from formal training are actually working with the project and continue to be committed to and employed within the project or closely related activities.

The project was designed to establish individual seed institutions (research, multiplication, distribution, quality control, and enforcement) under different administrative units. The fact that such a system required linkages and coordination was recognized and mechanisms for achieving coordination were mandated in the National Seeds Legislation. In fact, there is excellent coordination between most seed institutions.

A program for producing and distributing improved seeds to small farmers did not exist prior to the project. A system is now in place and operating, albeit at a low level of efficiency. Given the economic environment and political orientation of the country, this system is unlikely to undergo radical changes. It appears, however, that the system in place could function reasonably well with some fine tuning if and when the general economy begins to recover.

The seed project did not recognize the extent to which its success was dependent on the performance of related, non-seed institutions. Of greater importance was the failure to realize that seeds, regardless of their importance, are a small input to the total farm economy; therefore the seed component must exercise initiative in establishing essential linkages and in selling its product to other institutions and small farmers. Also, the seed program has to accommodate itself to changes in other institutions in matters not relating to quality.

Finally, the project was implemented as originally designed with few changes. This was done in spite of problems encountered -- parts procurement, and so on, -- and major changes in the economy and related institutions throughout the life of the project. While the goal of establishing sustainable seed institutions should not have changed, implementation plans should have been modified at several stages of the project to take into account these developments and their impact on the project's success.

V. LESSONS LEARNED

1. Overall levels of mechanization and sophistication of specific equipment and facilities should be kept to the bare minimum required.

Equipment utilized in mechanized operations should be of adequate scale and sophistication to perform the tasks for which mechanization is required but should be as small and minimally sophisticated as possible to accomplish those tasks. Moreover, to the extent possible, equipment should be purchased which offers the best possibility for being repaired and serviced in the country in which it will be used.

Only those operations which limit production and quality (e.g., seedbed preparation) should be mechanized -- not the entire production and processing process. The fact that some operations are being successfully done by hand (e.g, maize harvesting) demonstrates that not all operations need be mechanized.

2. The fundamental goal of establishing essential institutions on a "bare bones" basis should not be changed during the life of the project, but implementation should be modified as experience is gained from the project and as external conditions change.

The strength of this project lies in the fact that the institution-building goal was persistently pursued; however, project implementation should have resulted in scaled down, less sophisticated seed institutions and more attention should have been devoted to other institutions, policies, and economic factors as their impact on the project became evident.

3. Problems of distribution and marketing should be explicitly analyzed and addressed as part of project design and implementation in projects that produce either a farm input or consumer product.

It is a mistake to assume that marketing is a second generation problem or that a product, no matter how good, will sell itself. While projects may not necessarily need to explicitly include a marketing component, they do need to ensure that the marketing function is adequately undertaken by some entity.

4. Assumptions in project design regarding requisite actions by institutions which complement the project, and which are central to its success, must be acted upon in project implementation and not be left dormant in project design statements.

In this project, certain assumptions were made in project design documents concerning the complementary roles which were to be performed by other institutions. During implementation, project officials took little initiative to ensure that this complementarity was forthcoming. If anything, they abandoned

trying to foster these linkages and concentrated on internal project management concerns.

5. Project designs should not assume that other institutions which are critical to the success of the project will undertake, or can perform, ambitious assignments; indeed they may not even try.

This project assumed that extension would and could sell small farmers on the adoption of improved seeds in a short time frame. Likewise, it assumed that the Tanzania Rural Development Bank (TRDB) would solve credit problems and that TanSeed would solve distribution problems parallel with the development of the seed multiplication process. Obviously, this has not happened. In retrospect, such assumptions would have been unrealistic under the best of conditions and are not supported by experience elsewhere, even in developed nations. Nor was it sufficiently recognized that such institutions may have different, even conflicting, agendas and priorities.

6. When a project is located in an economy with strong public sector control, it should be recognized that free market mechanisms such as price will not be able to serve the coordinative and allocative functions they perform in a market economy.

Where free market assumptions prove invalid, project designs may require modification. This project implicitly assumed that prices would reflect demand for seed. This has not proved to necessarily be the case. With care, other measures for estimating demand can be developed which may be as reliable as market prices. Indeed, the latter can also be misleading for future production.

7. Every effort should be made to keep expected goals and outputs realistic.

This project, for example, specified at various times that the seed program would lead to doubled production of food crops, self-sufficiency plus exports, and so on. Such results were unrealistic. Unfortunately, such goals are sometimes taken seriously and become assumptions on which further plans are based. The team realizes that there always is, and should be, enthusiasm for a project in project design. Also, there is competition for funding for projects. Nonetheless, exaggerated claims can engender severe criticisms when projects do not produce as anticipated.

8. Institutional and infrastructure support systems common

in much of the developing world are frequently relatively undeveloped in Africa. This condition should be recognized in project identification, design, and implementation stages and planned for accordingly.

In this project, lack of adequate support systems made complete achievement of project goals virtually impossible. A poor transport network (complicated by the vast distances separating the most productive areas) meant that seed distribution problems were almost insurmountable. Critical shortages of manpower existed in complementary institutions. Marketing development had reached only rudimentary stages. In short, much that can be taken for granted in other parts of the developing world was not in place when the project began but was required for it to meet all its objectives. We note, parenthetically, that had a strictly private sector approach been utilized, it also would have been severely hampered by these constraints.

This condition raises the question of whether development of a complex seed system should have been undertaken in the first place. The IADS publication, "Key Macro-Policy, Technical, and Socio-Economic Issues in Agricultural Inputs and Credit," suggests (p. 36) that in contexts like that of the project such an approach to input development is inappropriate. The team believes, however, that the situation poses a dilemma. One approach is to strive for an ideal system and to try over time to meet its standards. A second approach is to strive for a less ideal system and to try over time to upgrade it. Either approach will probably work if all involved understand the limitations of the particular approach taken. Such limitations were neither implicitly nor explicitly recognized in project documents.

APPENDIX A

METHODOLOGY

The evaluation was undertaken over 4 weeks in June 1983 by a team of four persons whose backgrounds and experience are described in Appendix F. With the exception of 2 days of briefing in Washington, D.C., the time was spent in the field. For logistical reasons, the team traveled together as a unit throughout the study.

AID documents dealing with the project, including evaluations and special studies, were reviewed. Reports by the Tanzania Government, the U.S. Government, the World Bank, and the Food and Agriculture Organization (FAO) that related to the operation and impact of the project were analyzed. A number of additional publications were read for background information and insight into institutional structure and performance. Secondary materials that were most useful are cited in the bibliography. Project documents

are not cited.

The team spent 8 days outside of Dar es Salaam visiting the facilities and personnel of institutions directly concerned with seeds--research institutes, the agricultural university, seed laboratories, foundation farmers, certified seed growers, and TanSeed. The views of the Tanganyika Farmers Association, a private sector cooperative, were also obtained.

Regional Agricultural Development Officers and Extension Officers were contacted. It was possible at each stop to have meaningful interviews with key persons -- usually the senior officials. Those interviewed were exceptionally candid and frank in their views and the team appreciated this candor.

The team was unable to interview small farmers in any systematic manner because of general problems of inaccessibility and, more important, the time-consuming protocol necessary to arrange for and to visit individual villages. Also, because the purchase of seeds involves a collective decision, a representative sample of farmers would have had to come from several randomly selected villages or from selected representative villages.

Senior officials in the Ministry of Agriculture in Dar es Salaam who are involved in the seed system were interviewed as were officials of parastatals directly concerned with seeds -- TOSCA and TRDB. The managing partners of TanSeed (CDC and NAFCO) were interviewed. World Bank officials, who are involved in several supporting activities, were also interviewed.

APPENDIX B

LESSONS FOR PROJECT DESIGN AND IMPLEMENTATION

by Michael S. Zak

1. Project Cost and Recurrent Expenditures

From the project documentation it was not possible to determine the cumulative investment in the project by either USAID or the GOT, nor was it possible to determine from other records available at the USAID Mission total AID or GOT support to the project.

Recommendations:

USAID and host country financial inputs by project seem to be incompletely recorded and documented at the field level. An agency review of this circumstance to determine its extent and severity and possible corrective measures seems warranted.

2. Project Logical Framework (Log Frame)

The original logical framework (log frame) remained virtually unchanged throughout the 10-year funding life of the project. Important assumptions as to the broader Tanzanian environment did not reflect realities being reported in Mission planning and program documents. As a result, over time, the log frame assumptions proved increasingly unrealistic. It is not clear whether those responsible for project design and implementation were trained in and/or utilized log frame methodology as an integral element of project management.

Recommendation:

A project's logical framework should reflect the realities of a project's goals, purposes, outputs, and inputs throughout a project's life. Accordingly, project managers should be required to revise the log frame as major developments in the host country or AID environment (or other factors) warrant. The continued validity of the existing log frame, or a revised version, could usefully be appended to the Project Evaluation Summary (PES). Finally a determination should be made regarding training on log frame use.

3. Project Documentation

During the life of the project there were 12 project agreements, exclusive of amendments. With one exception these provided only for funding of USAID inputs. None contained a clear articulation of specific targets, or of responsibilities of USAID and the GOT for implementation and evaluation.

When USAID shifted over to its current project documentation system in the late 1970s, the documentation for this project did not follow suit.

Recommendation:

The current USAID documentation system requiring a brief description of the project (Annex to the Agreement) and project objectives normally should preclude this type of problem. USAID should require that Agreements or project implementation letters contain the essential elements of the evaluation plan or protocol.

4. Project Evaluation Findings and Incorporation of Findings in Project Paper Revisions and Implementation

We were able to identify at least six internal and external evaluations during the life of the project. While evaluations were used in project redesign documentation, it was not possible to track all major evaluation conclusions and recommendations (such as lessons learned) in such documentation.

Recommendations:

It would be useful for all parties were Missions/Offices obligated to systematically record actions taken on PES recommendations. Project design or redesign should reflect as an annex principal PES findings and conclusions and actions taken on evaluations. USAID/Washington (Bureau for Program and Policy Coordination, Center for Development Information and Evaluation and other Bureaus) should develop guidance for inclusion in Handbook 3, with cross-references between design requirements and the Evaluation Annex.

Further, a useful adjunct to periodic project implementation reports now being submitted to USAID/Washington would be to record actions taken on evaluation findings.

5. Participants in the Evaluation Process

Evaluations during project life tended to use in-house Mission resources, AID/Washington staff, and contractors. We saw no evidence of host country participation in the evaluation process. As a result, an important learning dimension/opportunity to USAID and the host country was lost.

Recommendation:

Missions should be encouraged to employ host country personnel as integral members of evaluation and design teams.

APPENDIX C

SOCIOPOLITICAL CONSIDERATIONS INFLUENCING PROJECT SUCCESS{1}

by L. Richard Meyers

All projects are influenced by the socioeconomic and sociopolitical contexts in which they are set. This appendix briefly describes salient characteristics of the project's sociopolitical environment which have had significant impacts throughout the project's 11-year lifespan.

I. POLITICAL ORIENTATION

A. African Socialism

Tanzania has adopted a socialist model of development aimed at achieving both economic growth and equitable distribution based on the principles of self-reliance and democratic participation. The philosophical underpinning for this approach was enunciated in the Arusha Declaration of 1967. At the heart of this philosophical rationale is the concept of the traditional extended family system in which productive activities and their returns are shared communally and equitably. The objective is the creation of a society in which the individual functions without exploiting or being exploited by others. Such an approach implies that government's primary concern is as much with distributing the fruits of growth as with growth itself. Policy implications of this approach have entailed a steep progressive tax, subsidized prices of staple foods, relatively high minimum wages, and so on. Parallel to these actions, the government has devoted considerable resources to providing social services for the mass of its citizens.

{1} This appendix quotes extensively without formal citation from USAID/T Field Budget Submission and Country Development Strategy Statement.

B. Self-Reliance

This concept has several connotations. On the one hand, it refers to the way in which the Tanzanian peasantry, operating at the village level and through the political party apparatus, are to increasingly gain through local effort ("hard work is the root of development") control over their economic and political destiny, thus reducing centralized control.

A second aspect involves reducing Tanzania's dependence on the outside world through transformation of the production and consumption structure into a self-sustainable socialist system based on the use of domestic resources for domestic needs. Perhaps most significant, in terms of practical implications, has been the "Basic Industries Strategy" adopted in 1975 which was designed to industrialize the economy in 20 years, thus lessening Tanzania's dependence on the industrialized world.

Pursuit of such an investment strategy has, of course, not been without its cost to the agricultural sector.

II. "VILLAGIZATION"

Nyerere's oft-cited essay of 1967 entitled "Socialism and Rural Development" provided the philosophical foundation for a program of rural transformation that has become the centerpiece of Tanzania's rural development efforts, namely the creation of Ujamaa villages. He described the basic values embodied in the Ujamaa concept: communal work and ownership of land, equitable distribution of basic necessities, and respect for the rights of each member of society.

Nyerere believed that moving peasants into villages was necessary to achieve economies of scale in production and savings in the cost of delivering economic and social services. It would also help guarantee equal opportunity, minimize exploitation, and facilitate socialist mobilization.

Ujamaa villages were established beginning in 1968, initially on a voluntary basis. This involved resettlement into common villages where common services could be provided and people could work communally. By 1972, over 2 million people or 15 percent of the population were living in villages. New villages were given priority for provision of social services. Dissatisfaction with the speed of resettlement led to a directive in 1973 that all Tanzanians be required to live in villages by 1976. A village was defined as a site acceptable to the Party, with clearly defined boundaries and with sufficient agricultural land for at least 250 families. In 1975, the Villages and Ujamaa Act was passed which provided the legal basis for villages to become registered corporate bodies capable of entering into legal contracts. This act set forth legislation concerning the registration, recognition, and government of villages.

Operation Vijijini ("villagization") had by the end of 1976 resulted in the resettlement, sometimes by force, of an estimated 13 million people into some 8,000 villages. Modifications in the program were inevitable. Requirements for communal farming were temporarily postponed in favor of privately cultivated adjacent plots or "block farms." Also, limited government resources meant that not all new villages received a full complement of social services.

III. DECENTRALIZATION

Decentralization has been a major component of Tanzania's self-reliance strategy and is designed to place the planning and control of development at the local level. In 1972 the bureaucracy was reorganized. Certain local government structures (city and district councils) were abolished and significant

numbers of central government officials were sent out to the regions and districts.

Regional government authorities were given responsibility for local planning and implementation. Technical ministry personnel were brought under the Prime Minister's Office. This meant functional managers (such as regional and district agricultural development officers) continued to receive technical direction from their ministry but were directly responsible to the regional and district authorities rather than central government as before. Thus, Regional Development Directors or Regional Commissioners could utilize technical people as they saw fit, for example, order an extension agent to move people into villages.

At the village level, Village Councils were created in 1975 with broad responsibilities for management of village affairs ranging from security to planning to welfare concerns. Village Councils were made corporate bodies capable of entering into all manner of legal arrangements. The village was deemed a cooperative society (cooperative unions were disbanded by the 1975 Villages and Ujamaa Act).

IV. ROLE OF THE POLITICAL PARTY

It is important to note the role of the political party in the development process. The party embodies a national political movement as well as a political party. The party and bureaucracy have in the past been intertwined and shared power and responsibility from the village to the national level. Currently, officials hold offices parallel to government officials at all levels. Policy directives come from the party. The party strongly influences decision-making at the regional and district level regarding particular development projects, use of reserved funds, the location of specific activities, placement of staff, and so on. In short, its influence on the administration of development programs is pervasive.

V. PUBLIC SECTOR GROWTH

Tanzania's economic history since independence has been marked by major growth of the public sector. Key sectors of the economy such as banks, insurance companies, external and wholesale trade and import manufacturing firms have been nationalized. There has been a spectacular growth in the size and scope of parastatals -- from just under 70 in 1967 to almost 400 in 1981. This growth was largely motivated by the Government's desire to place under public control economic and commercial functions previously undertaken by the private and cooperative sectors -- crop marketing and processing, agricultural and industrial production, tourism, banking, and retail distribution.

Parastatals in agriculture alone are involved in organizing aspects of the following range of agricultural functions:

marketing (including sole rights to buy grains domestically and to import them -- National Milling Corporation [NMC]), production, credit, inputs, research, extension and education, transport, and retailing. Moreover, a significant characteristic of Tanzanian public sector growth has been the tendency toward public sector monopolization in the agricultural economy.

The performance of parastatals has been the subject of much criticism from outside as well as within Tanzania. Some of their more outstanding problems include too broadly defined functions; poor management, partly as a result of insufficient and inadequately trained manpower; overstaffing at junior levels; weak accounting systems; insufficient equity as well as working capital; lack of attention to maintenance; and liquidity problems (preventing, for example, timely payments to farmers for crops purchased). There is general consensus that parastatals have been relatively inefficient providers of services. Government and other interested parties, notably, the World Bank, continue to differ, however, on ways to make them more efficient, and especially over the potential role of the private sector in the provision of services.

VI. CONCLUSIONS

It is not possible in this brief appendix to trace the many ramifications, direct as well as indirect, of developments outlined above on the Seed Multiplication Project. Nonetheless, important emphases and their consequences that should be highlighted are as follows:

1. Emphasis on Industry. Not enough attention has been paid to the agricultural sector² (services, infrastructure, etc.) nor has there been sufficient investment. These might have led to greater farmer interest in increased production and use of improved seeds. Presently, the Government is placing much greater emphasis on agriculture.
2. "Villagization." While the evidence is neither conclusive nor easily generalizable, it appears that the physical disruptions involved in resettlement and the subsequent ecological problems of nucleated settlement have not in the aggregate created sufficient financial and material incentives for peasants to increase marketable production.
3. Decentralization. Placing local functional Ministry personnel under the control of regional and district authorities made for less effective delivery of technical services. Perhaps most important for the seed project was the resultant demoralization of the extension services that occurred and the weakening of its ability to promote the use of improved seed. The GOT's recent decision to place extension once again under the MOA indicates its intention to strengthen the capability of the extension services.
4. Parastatals. Problems in agricultural parastatal performance

have led to decreased price incentives for farmers (increased price of seed and lowered price for their products), untimely delivery of inputs and collection of crops (storage losses), oversubsidized credit followed by repayment problems, and so on. All of these factors have had a major negative influence on farmers willingness to use improved seeds.

{2} "No matter what explanation we may have for the poor state of agriculture, and indeed that of the national economy, one thing is very clear: We have for too long been neglecting agriculture." "Comment" column, Tanzania Daily News, June 28, 1983.

APPENDIX D

SEED PRODUCTION IN TANZANIA

by Dr. Bruno Ndunguru

A seed program is an integral element of the national strategy for agricultural improvement and aims at producing and supplying high-quality seed of improved varieties at the right place and price. Hagan et al. (1979) have classified the seed industry in Tanzania into three major divisions, namely, traditional, commercial, and the improved (certified) seed. A high percentage of the seed planted in field crops is traditional seed. The farmer uses some of his current production for the following year's seed stock. This type of seed is normally of an unknown heritage. However, the fact that it has evolved time in the existing conditions means it is fairly adaptable, especially when no other inputs are involved. For any improved seed to be accepted by peasant farmers, it will have to prove superior to the traditional seeds not only in terms of yield but, more important, in its ability to be a consistent yielder in the farmers' fields, often under adverse conditions.

The structure and functions of the major components of the improved seed industry in Tanzania are presented in Figure E-1. Plant breeders located at the Agricultural Research Institutes are involved in the development of new varieties as well as the testing and adaptation of improved seed varieties. These research institutes are under the Tanzania Agricultural Research Organization, which is a parastatal under the MOA. Some breeding work on food crops is also carried out by the Sokoine University of Agriculture at Morogoro and the Uyole Agriculture Center at Mbeya.

Before a seed variety is released by breeders it goes through a seed release committee, a subcommittee of the Seed Production Committee. This committee scrutinizes the technical aspects of the seed such as growth habit, maturity, plant characteristics, as well as the agronomic package it requires, for example, spacing, fertilizer requirements, pest and disease control, harvesting, processing and storage techniques, germination, and purity. The Seed Production Committee is empowered

to designate, add, delete, or recommend a new variety for release. The Committee's composition includes researchers (breeders, agronomists) foundation seed farm managers, TOSCA, TanSeed and the staff from the Directorate of Extension and Technical Services, MOA.

The Seed Production Committee has had to reconcile pressures from the plant breeders who have been keen to release their seeds on one hand, and the foundation seed farm managers and the extension staff on the other hand who have not been keen to change the type of seeds as often as the breeders want. Several varieties of maize, sorghum, rice, millet, soybean, bean, simsim, greengram, sunflower, and cowpea seeds have been released.

On the whole research that was supposed to assist the seed industry has performed fairly well on most crops, and the quality of the breeder seed has been reasonable, although improvements are still needed. For example, with maize it has been argued that the development of composites has been at the expense of development of hybrids which are required for higher potential areas. This has resulted in the importation of hybrid seed in certain years. Similarly, the development and maintenance of the inbred lines does not seem to have kept pace with the hybrid requirements. It has, however, been pointed out that, around Arusha, for example, the composite UCA performs just as well as any hybrid available. This fact, plus the fact that a farmer does not need to buy new composite seed each year, means composites have an overall advantage and emphasis on them is justifiable.

Crop breeding takes a long time and breeders take pride in the varieties they develop. Hence, the seed industry would be better served if individual breeders would remain in one station long enough to see development of a variety through to its conclusion. Frequent staff turnovers are very disruptive.

The breeder seed is transmitted to the foundation seed farms for multiplication under carefully controlled conditions. The seed crop is guarded from all possible contamination (that is, natural pollination occurring in cross pollinated crop and physical admixture at harvesting or later stages). Isolation standards for each seed crop have been established and these are considered as minimum distances. Roguing (weeding out) of off-type plants, other variety plants, and other objectionable plants and weeds is undertaken. The fields are inspected by the Tanzania Seed Certification Agency to ascertain that the seeds have not lost their desired characteristics. Plant breeders assist with the roguing of undesirable plants.

Presently there are three foundation seed farms in Tanzania, namely, Arusha, Dabaga, and Msimba. It is the responsibility of TanSeed to indicate to the foundation seed farms the amount of foundation seed required each year. The foundation seed farms are owned and operated by the MOA.

The foundation seed farms harvest, clean, process, pack,

and deliver the seed to TanSeed. In general, the manner in which the foundation seed has been handled by the foundation farms is adequate. To date most of the foundation seed required is produced on time and the quality is reasonable.

The foundation seed is bought by TanSeed and the latter contracts with growers to produce certified seed. TOSCA has set up qualifications for contract seed producers and is obligated to carry on such educational work as may be necessary to train seed production personnel and producers. Qualifications for acceptance of growers' seed usually include adaptation of growers' land, equipment, and storage facilities. In addition, honesty, integrity, and cooperation on the part of growers is essential to conduct a successful seed production program.

Foundation seed farms are among those contracted to serve as certified seed growers. Although certain evaluations have recommended the discontinuation of this practice because of management problems that could arise in keeping the lines of breeder seed pure and the possibility of seed mixups, the team is of the opinion that since the foundation seed farms have capacity well beyond current requirements, using them to produce certified seed makes sense. There have been reports of seed mixing in Iringa Region, but it was difficult to ascertain whether the mixing occurred on the foundation seed farms or on other contract growers' farms.

TanSeed makes an annual assessment of the country's seed needs to determine the amount and kind of each seed to be grown as foundation and certified seed. These requirements are presented at the annual meeting of the Seed Production Committee along with the proposed prices for each kind of seed.

During the course of the growth of the certified seed, TOSCA is assisted by the National Seed Testing Laboratory in field inspections and quality and purity control procedures. TanSeed also has its own personnel who supervise and inspect these activities.

Although the responsibility for maintaining good quality seeds is shared by all those involved in the seed industry, the National Seed Testing Laboratories and TOSCA play an important role as they are directly concerned with certification. The laboratory equipment at Morogoro, which is highly sophisticated, is not working whereas the laboratory in Arusha, which is simply equipped, is working. The cold room at Morogoro, for example, has never worked and this has not affected overall performance of the seed laboratory. In spite of all this, the labs are performing well with the volume they handle. If the volume were increased, then the equipment not working would be a more limiting factor. These laboratories, in addition to performing purity and germination analyses, also conduct phytosanitary inspection and certification of seed lots as well as field inspections.

There is very close integration and coordination between

the activities of TOSCA and those of the seed laboratory. The Officer in Charge of the National Seed Laboratory in Morogoro is also the Chief Certification Officer.

It is the feeling of the team that the present arrangements which enable the National Seed Laboratory and TOSCA to operate under the MOA should be continued. Both laboratories, however, require more staff and training, particularly the inspectors. The necessary logistical support, such as transport during the peak periods, also needs to be improved.

In general, considering the number of crops which TanSeed and TOSCA handle as well as the long distances involved, the system works reasonably well. The few problems which occur can be rectified by strengthening the transportation system as well as that for supervision and/or inspection.

APPENDIX E

STATISTICAL INFORMATION ON TANZANIA

The information presented in this section is included to give readers unfamiliar with Tanzania general information on the country and its agricultural sector. All data, regardless of source, are dated and of limited reliability. Some of the figures presented for a given subject may not be identical to those found in our report. The data are adequate, however, to indicate major trends and conditions.

Table E-1. Facts About Tanzania{1}

Category	Quantity
Land Area	945,050 sq kms
Total population (mainland and Zanzibar-1978)	18,012,810
Number of peasant farmers (1971-72)	2,435,000
Number of peasant farmers with less than 0.5 ha	788,000
Number of peasant farmers with more than 0.5 ha	1,647,000
Area used for maize production (1971-72)	
Pure crop	423,000 ha
Mixed with one crop	449,000 ha
Mixed with two or more crops	109,000 ha
Maize Yield (1971-72)	1,717 kg/ha
Area used for millet production (1971-72)	
Pure crop	163,000 ha
Mixed with one crop	125,000 ha
Mixed with two or more crops	57,000 ha
Total area of peasant farms (1971-72)	3,069,000 ha

Total workers on peasant farms (1971-72)	5,679,000
Number of large-scale farms (1971-72)	2,794
Total area of large farms	957,200 ha
Ujamaa farming: (1971-72)	
Number of villages	2,501
Total area farmed	3,518,900 ha
Total number of households	385,385
Area operated per Ujamaa household	11.2 ha
Net area sown per Ujamaa household	6.1 ha
Number of public primary schools (1979)	9,794
Number of students in primary schools (1974)	3,197,000

 {1} Source: Statistical Abstract 1973-79, Bureau of Statistics,
 Ministry of Planning and Economic Affairs.

Table E-2. Profile of Peasant Agriculture,
 Tanzania 1978

	Zone I	Zone II	Zone III	Zone IV
Features	Highland	Western	Coast	Central
			Semi-Arid	
1. 90% rainfall probability (MM)	Above 1500	500-1000	500-1000	500 less
2. Altitude (meters)	Above 1500	500-1500	0-1250	300-1500
3. Dominant export crops	Coffee, Tea Pyrethum Oilseeds	Cotton Tobacco	Cashewnuts Coconuts	None
4. Dominant food crops	Plantain, Hybrid Maize, Beans, Irish Potatoes	Cassava, Maize, Peas Sweet Potatoes	Rice, Composite Maize, Cassava	Sorghum Millet
5. Livestock	Dairy, Pork Use Small Ruminants	Intensive Poultry, Fish	Intensive Use Grazing Lowland	Extensive
6. Most representative areas	Highland Areas Kilimanjaro Arusha, Tanga Mbeya, W. Lake	Mwanza, yanga, Tabora	Mtwara, Lindi Coast, Morogoro Tanga	Dodoma Singida Arusha Iringa

7. Total rural population (millions)	3.5	5.0	3.8	2.7
8. Average farm size (ha)	.95	1.35	1.10	1.20
9. Size of holding cultivated under export crops (ha)	.45	1.00	.90	0
10. Percentage total holdings cultivating less than 1 ha	85	45	65	40
11. Total number of holdings (000's)	580	1000	950	600
12. Number of people per holding	6.0	5.0	4.0	4.5
13. Proportion of holding with access to export crops	60	50	40	0
14. Area cultivated (000's ha)	550	1350	1050	700
15. Effective area cultivated (000's ha)	910	1820	1520	910
16. Income per holding from export crops (T.Shs.)	1300	1200	600	0
17. Income per holding from major food crops (T.Shs./day)	1200	600	750	450
18. Total income per holding (T.Shs./year)	2500	1700	1350	450
19. Return to labor for export crops (T.Shs./day)	18.75	5.50	7.00	0
20. Return to labor for major food crops	17.50	7.00	8.50	5
21. Equivalent monthly wage of head of holding (T.Shs./mo)	870	300	370	120

Note: The minimum monthly wage in urban areas in 1978 was T.Shs. 380/-.

Source: Tanzania Country Development Strategy Statement FY 1982, USAID, January 1980, p. 8.

APPENDIX F

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L. Richard Meyers is currently with the Directorate for Human Resources, Bureau for Science and Technology, USAID, Washington. He has a Ph.D. in rural sociology from Cornell University. His career includes 4 years of experience as a volunteer in rural Botswana and several years in Kenya working in the Ministry of Economic Planning and Development. In Kenya he worked at both district and national levels assisting district-level officers formulate 5-year district development plans.

Bruno John Ndunguru is currently Senior Lecturer and Head of the Department of Crop Science at the Sokoine University of Agriculture, Morogoro. His formal training includes a B.S. in agriculture from the University of Sokoine and M.S. and Ph.D. degrees in plant and crop physiology from the University of Reading. His entire professional career has been devoted to teaching and research at the University of Sokoine. He is a member of the Council of TARO and the Seed Production Committee of MOA, as well as a member of the Board of Directors of Uyole Agriculture Centre. He is currently project leader for four IDRC- and USAID-supported research projects, including one on farming systems. He has been involved throughout his career in work directly related to Tanzanian seed institutions.

APPENDIX G

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