PD-RAU-976
48631

AGENCY FOR INTERNATIONAL DEVELOPMENT

# PROJECT IDENTIFICATION DOCUMENT FACESHEET (PID)

1. TRANSACTION CODE: A = Add, C = Change, D = Delete — [A] Revision No. ____ | DOCUMENT CODE: 1

2. COUNTRY/ENTITY: SUDAN

3. PROJECT NUMBER: 650-0081

4. BUREAU/OFFICE: A. Symbol: AFR | B. Code: 06

5. PROJECT TITLE *(maximum 40 characters)*: PRIVATE SECTOR SEED INITIATIVE*

6. ESTIMATED FY OF AUTHORIZATION/OBLIGATION/COMPLETION
- A. Initial FY: 87
- B. Final FY: 91
- C. PACD: 93

7. ESTIMATED COSTS ($000 OR EQUIVALENT $)

| FUNDING SOURCE | | LIFE OF PROJECT |
|---|---|---|
| A. AID (U.S. DOLLARS) | | $9,000,000 |
| B. Other U.S. | 1. | |
| | 2. | |
| C. Host Country (Sudanese Pounds) | | LS41,000,000** |
| D. Other Donor(s) | | |
| TOTAL | | $9 MILLION, LS 41 MILLION |

8. PROPOSED BUDGET AID FUNDS ($000)

| A. APPROPRIATION | B. PRIMARY PURPOSE CODE | C. PRIMARY TECH. CODE 1. Grant | C. PRIMARY TECH. CODE 2. Loan | D. 1ST FY 87 1. Grant | D. 1ST FY 87 2. Loan | E. LIFE OF PROJECT 1. Grant | E. LIFE OF PROJECT 2. Loan |
|---|---|---|---|---|---|---|---|
| (1) ARDN | 113 | 074 | | 2,500 | | 9,000 | |
| (2) | | | | | | | |
| (3) | | | | | | | |
| (4) | | | | | | | |
| TOTALS | | | | 2,500 | | 9,000 | |

9. SECONDARY TECHNICAL CODES *(maximum 6 codes of 3 positions each)*: 076

10. SECONDARY PURPOSE CODE:

11. SPECIAL CONCERNS CODES *(maximum 7 codes of 4 positions each)*

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| A. Code | | | | | | | |
| B. Amount | | | | | | | |

12. PROJECT PURPOSE *(maximum 480 characters)*

To increase crop yields through the use of improved seeds provided by the private sector seed industry.

13. RESOURCES REQUIRED FOR PROJECT DEVELOPMENT

Staff: USAID/S: Project Development Officer

REDSO/ESA: Regional Legal Advis
Regional Environment Officer

PD&S: $60,000
LS 30,000

CONTRACT : PDO
Economist
Marketing Expert
Seed Specialist

Funds

* Project title has been changed from Private Initiative Seed Technology

** Depending on whether the official, commercial or free market rate is used, the GOS contribution would be worth, respectively, the equivalent of $16.6 million, $10.0 million or $7.3 million.

14. ORIGINATING OFFICE CLEARANCE
- Signature: John W. Koehring
- Title: Director, USAID/Sudan
- Date Signed: MM DD YY: FEB 28 1987

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

16. PROJECT DOCUMENT ACTION TAKEN: [ ] S = Suspended, A = Approved, D = Disapproved, CA = Conditionally Approved, DD = Decision Deferred

17. COMMENTS

18. ACTION APPROVED BY
- Signature
- Title

19. ACTION REFERENCE

20. ACTION DATE: MM DD YY

# SUDAN - PRIVATE SECTOR SEED INITIATIVE PID

(650-0083)

## TABLE OF CONTENTS



## ANNEXES

## PROGRAM FACTORS

I. A. Conformity with Recipient Country Strategy/Program

The agricultural development strategy of the Government of Sudan (GOS) places a high priority on increased agricultural production from existing cropped land to meet the growing demand for food, to increase foreign exchange earnings and to improve farmers' incomes. In addition, following the 1983-1985 drought, which resulted in widespread food deficits in many of the traditional rainfed farming areas of central and western Sudan, food security is now also a primary GOS objective. During the drought, stored grain and seed reserves were severely depleted and livestock herds were drastically reduced by starvation, disease and an increase in off-take rates. Donors provided over one million metric tons of food grain and other emergency food supplies in 1984-1985 to assist in alleviating mass starvation, malnutrition and suffering among the affected, mostly traditional farm families and rural non-farm people.

The GOS has for some time recognized the major role improved seeds can play in helping Sudan reach its objective of food self-reliance. The importance of improved seeds was highlighted by the Prime Minister himself in January 1987 in a speech delivered in Khartoum to the Annual Review and Programming Meeting of the Senior Scientists and Board of Directors of the International Center for Agricultural Research in Dry Areas (ICARDA). Noting the overwhelming importance of agriculture to Sudan and indicating his government's intention of increasing agricultural production, the Prime Minister ranked Sudan's agricultural priorities in the following order: (1) seed improvement, (2) pest management and (3) better extension services.

Government-sponsored programs for seed improvement go back to the beginning of agricultural research in Sudan in 1902. Expanded official support for seed research over the years led eventually to the creation in 1967 of the semi-autonomous Agricultural Research Corporation (ARC), which is responsible for seed research, testing, and development, focusing on the introduction of new seed varieties and the production of breeder seeds. The GOS's National Seed Administration (NSA) - originally established in 1964 as the Plant Propagation Department, the name was changed in 1982 - has responsibility, through its Plant Propagation Administration (PPA) and Seed Certification Administration (SCA), for the maintenance and multiplication of all foundation and registered (certified) seed, other than cotton, for government schemes, mechanized farming corporations and other seed users.

Up to now, all seed improvement efforts in Sudan have been carried out by the public sector and directed towards filling the need for improved seed for primary export crops - cotton, groundnuts and sesame - and for basic food crops - sorghum, millet and wheat. Private sector involvement of any sort in the seed industry was minimal until the ARC's Subcommittee for the Release of Varieties released the first Sudan-developed hybrid sorghum variety (HD-1) in 1983. The new locally developed variety attracted the interest of a number of Sudanese and expatriate private sector seed firms, several of which invested capital and resources in producing HD-1 sorghum seed. Increased private sector seed production led to the organization of the Sudanese Seed Growers Association in January 1986.

The interest of Sudanese businessmen and investors in private sector seed production was further sparked by visits in 1985 and 1986 by representatives from U.S. and European seed companies and by experts from International Agricultural Research Centers (IARCs). At the same time, some GOS politicians and officials began speaking publicly in favor of private sector participation in the production of improved and hybrid seeds. This positive development could signal the beginning of a real shift in GOS thinking away from the public sector monopoly of the 1960s and 1970s towards support for a private sector role in the seed industry. The present government does not seem to have ideological problems about working with the private sector.

B. Relationship to A.I.D. Strategy Statement

USAID/Sudan is currently operating under an FY 86 CDSS that was prepared and submitted to AID/W in 1984. The FY 86 CDSS reordered A.I.D. priorities for agriculture in Sudan by concentrating A.I.D. resources and inputs on the private sector, reaffirming the need for a more explicit rainfed agricultural strategy, and focusing attention on western Sudan. The last two elements of the strategy have received attention under the Western Sudan Agriculture Research Project (650-0020), the Kordofan Rainfed Agriculture Project (650-0054) and the Western Sudan Agriculture Marketing Road Project (650-0069). In addition, along with emergency food grain imports, the severe drought of 1983-1985 led to a number of A.I.D.-financed seed activities.

Since the onset of the drought in 1983, A.I.D. has disbursed over $18 million in foreign exchange and local currency in Sudan on seed activities. The local currency equivalent of $10 million was used in 1985 for the local procurement and distribution of early maturing varieties of sorghum and millet seeds for planting by drought-affected farmers in western Sudan. This humanitarian effort was supplemented by the equivalent of $2.5 million in local currency assistance for improved seed production by the NSA, for private sector seed production activities, and for seed procurement by the Agricultural Bank of Sudan. The remaining $5.6 million, in U.S. dollar assistance, was used to finance the offshore procurement of wheat, sorghum and groundnut seeds to replenish depleted country seedstocks.

A.I.D. involvement with drought-related seed activities stimulated thinking at USAID/Sudan about ways that seed assistance might be used to help Sudan increase basic food grain production and build reserves needed as a protection against future droughts. USAID/Sudan's conclusion was that assistance for improved seeds, which would increase production without requiring major changes in traditional farming practices, was the quickest and least expensive way for Sudan to achieve food self-reliance. In support of that finding, the Private Sector Seed Initiative Project will help make improved seeds more readily available to farmers by increasing private sector seed production and distribution, while helping to improve the efficiency of GOS seed support activities.

The proposed project, by focusing on private sector seed production, will complement earlier public sector-oriented seed projects in Sudan funded by other donors. Over the past 10 years, the GOS has received seed improvement assistance, apart from A.I.D., from the Food and Agricultural Organization (FAO), the United Nations Development Program (UNDP), the FAO/Iraqi Fund, the

African Development Bank (AFDB), African Development Fund (AFDF), and the Government of Austria. Beginning in 1975, FAO/UNDP provided about $1 million in technical assistance, training and commodities to strengthen the seed industry in Sudan by reorganizing the PPA to improve its seed production and by setting up a national seed certification and quality control administration, the SCA. A follow-on project financed by the AFDB/AFDF in 1981, and implemented by FAO, provided a loan of $9 million to expand the seed industry in Sudan. The main objectives of this project were to substantially increase the production of quality seeds and increase the number of skilled seed industry personnel.

Additional strengthening of the public sector side of the seed industry came from projects that provided facilities of potential use to private sector seed producers. In 1979, the FAO/Iraqi Fund project, which provided funds to the PPA for the development of an irrigated groundnut and sesame seed multiplication farm, established a groundnut seed processing plant. Similarly, at Sennar, the Government of Austria has financed construction for the NSA of a modern, large-capacity seed cleaning and processing plant, complete with storage facilities. Opened in early 1984, this plant successfully underwent its first large-scale test in 1985, when it cleaned and processed over 7,500 metric tons of sorghum and millet seed for the A.I.D.-financed Western Sudan Seed Reserve Initiative Project.

## PROJECT DESCRIPTION

### II. A. Perceived Problem

Sudanese agriculture has not been able to feed the nation's population for most of the past several years. The most publicized part of the problem has been the devastating 1983-85 drought, which caused sharply lower yields or total crop failures in most parts of the country. Better rains produced a much improved harvest in 1986, but other problems continue to plague the agricultural sector, casting doubts over its long-range ability to feed a population growing at 2.8 percent a year, let alone produce crops for export. Among those problems, one of the most serious is low crop yields.

Average production per feddan for most crops in Sudan, particularly food grain grown under rainfed conditions (sorghum and millet), is very low. Sorghum production seldom exceeds half a ton/hectare under rainfed conditions, compared to average yields in the U.S. of about 3 tons/hectare. Irrigated sorghum in Sudan does only marginally better with production averaging less than one ton/hectare. The continuous deterioration in the quality of planting seed used by farmers, combined with declining soil fertility resulting from poor cultivation practices, particularly in the rainfed traditional sector, has resulted in crop yields declining at a rate of about 2-3 percent per year. To compensate for lower yields and to meet the constantly growing demand for food grain, farmers usually open and clear new land every year at the expense of land used for forage and fuelwood. Not only has this encouraged desertification, but it has also increased the cost of production. Increased production costs have led to high floor prices for food grain, making Sudanese food grain exports noncompetitive in world markets at the existing overvalued FX rate.

Among the various factors affecting crop productivity in the Sudan, the use of poor quality seed by farmers is one of the most serious. Research and extension results during the past decade have clearly demonstrated that the use of quality seeds which belong to a suitable variety would increase crop productivity by 20-30 percent without any additional inputs. With additional inputs, production from improved varieties, particularly hybrids, could be as much as 300 percent higher than present yields.

Farmers do not have access to quality seeds for a variety of reasons:

(1) The GOS's National Seed Administration, which is in charge of multiplication and certification of seed varieties developed by research breeders, is able to meet less than 10 percent of the demand for improved sorghum seeds, and an ever lower percentage for other crops. And what improved seed is produced is mainly distributed to public sector agricultural schemes and to large mechanized farms. Overmanned and underfunded, the NSA lacks the resources and motivation to significantly increase its production of improved seeds.

(2) The private sector, at present, is not a substantial alternative source of seeds. Seed imports by the private sector are restricted by a shortage of foreign exchange, while local production is hindered by a lack of agricultural inputs and the use of less than optimal agricultural practices. In addition, private sector seed growers have found it difficult to compete against the low prices at which the NSA sells the seeds it produces.

(3) The present distribution system for seeds is rudimentary, with most improved seeds being obtained directly from PPA stations. There is no marketing network to bring improved seeds to small farmers. Inadequate extension services keep many farmers ill-informed about the benefits of using improved seeds and inhibit the growth of demand.

Not having access to improved seeds, most farmers in Sudan are forced to use poor quality seeds for planting. Consequently, average crop yields are very low, production costs are relatively high, and constant pressure exists to open new lands.

## II. B. Project Goal and Purpose

The goal of the project is to increase agricultural production in Sudan. This goal will be achieved by implementing this project in conjunction with other USAID and other donor-supported agriculture, energy and infrastructure projects. These projects will encourage agricultural production by supplying a variety of inputs, among them better access to credit, improved storage facilities, cheaper and more reliable water pumping, and improved transportation links.

The purpose of the project is to increase crop yields through the use of improved seeds provided by the private sector seed industry. Use of improved seeds alone will result in significantly higher crop yields. If other inputs, such as fertilizer, are added, production levels would be higher still.

II. C. Expected Achievements/Accomplishments

By the end of the project in 1993, it is expected that the following general conditions will exist:

1. Private sector growers will be producing an increased quantity of improved seeds.

2. The GOS's NSA will be more efficient in carrying out its seed regulation and certification functions.

3. An expanded and improved distribution network will make quality seeds more readily available to farmers.

4. Extension services will be teaching farmers the correct way to use improved seeds.

By the project completion date, a functioning private sector seed industry, including joint ventures between Sudanese growers and international seed companies, will be in place, producing a substantial proportion of Sudan's certified seeds. A more efficient NSA will be focusing its attention on seed regulation and seed certification and reducing its production of certified seeds. The production of foundation seeds will be shared between the NSA and the private sector growers. All of these achievements will directly contribute to the project purpose of increasing crop yields through the use of improved seeds provided by the private sector seed industry. Results of the project will be readily measurable in the records of the Ministry of Agriculture, the agricultural schemes, mechanized farms, and individual farmers.

II. D. Project Outline

The Private Sector Seed Initiative Project will address a number of constraints currently facing the seed industry in Sudan ranging from insufficient seed production to poorly developed distribution networks. The project will put most of its resources into helping the private sector, which needs assistance in seed production, processing and distribution. At the same time, the project will help the public sector improve its capability to carry out selected seed activities such as regulation and certification. The project recognizes that both the private and public sectors have a role to play in the seed industry and seeks to strengthen them within their respective areas of responsibility.

1. Private Sector

The project will provide the private sector with technical assistance, training and a financing facility for foreign exchange and local currency. The project's aim will be to increase the capabilities and production capacity of the private sector seed growers. The private sector has already shown its strong interest in developing the seed industry by its quick production response to a perceived demand for hybrid sorghum and its organization of the Seed Growers Association. To allow the largest number of seed growers to be reached on an equal basis, the project will funnel as much of its assistance to private sector producers as possible through the Seed

Growers Association, with which the contractor selected to implement the project will coordinate the scheduling of technical assistance and training.

Technical assistance to the private sector under the project will cover all major aspects of the seed industry - production, processing, marketing and distribution. For production, technical assistance will focus on helping seed growers expand output through better land preparation and cultivation practices. The aim will be to produce a consistently good product that can command a premium price on the market. Technical assistance for processing (cleaning, sorting, treating and packaging) will seek to ensure that seed handling is carried out to the highest standards. No new seed processing equipment should be needed as the Plant Propagation Administration has underutilized capacity at a number of its seed farms. Agreement will be reached with the PPA prior to project authorization allowing its seed processing facilities to be used by the private sector at a reasonable price on a timely basis.

To complete the seed cycle, the project will supply technical assistance to improve marketing and distribution, which are poorly developed at present. Better marketing, including higher standards of packaging, advertising and consumer education, is needed to inform farmers about improved seeds and devleop a wider customer base. Technical assistance will also be needed to devise ways of improving the distribution network, so that more farmers have access to improved seeds. Seed growers will be advised on the best ways to set up and expand distribution networks.

The second major element of project support to the private sector is training. Arranged by the contractor and channeled through the Seed Growers Association, training for seed producers will be made available in Sudan, the region and the United States. The project will fund in-country seminars and training sessions, bringing in U.S. seed experts to work with local producers, and will send seed growers to other African countries and to the U.S. on study tours and for short-term training. Particular emphasis will be given to exposing seed producers to successful field operations and practical management techniques, from production through distribution.

Finally, the private sector will be the beneficiary of a financing facility that will make foreign exchange and local currency available to seed growers. Foreign exchange will be made available for private sector producers to import seed inputs, such as foundation seeds and equipment, in accordance with A.I.D.'s procurement and environmental regulations. The seed producers will purchase with Sudanese pounds, at the highest legal exchange rate, the foreign exchange required for the imports, with the proceeds going into a special revolving fund which will make local currency loans for seed-related activities except for the importing of seeds to sell directly to consumers. The revolving fund will be managed by one of the commercial banks, with money being loaned at positive rates of interest for activities that meet financial and business criteria agreed upon by USAID and the bank.

The project will establish the local currency loan window by initially putting a fixed amount of money from counterpart generations into the financing facility. After that, infusions of pounds into the facility

will come from loan repayments and the payment of pounds for dollar-denominated commodities.

2. Public Sector

The project will make technical assistance, training and commodities available to the NSA for three of its present activities - regulation (control of seed imports and exports), certification and the production of foundation seeds. The project's aim will be to make the government's involvement in those three areas more efficient and more responsive to the needs of private sector producers. The NSA's fourth area of involvement - seed multiplication - will not be supported by the project as that activity should be carried out by the private sector. A small amount of funding will also be available under the project for selected construction activities directly related to the NSA's regulation, certification and foundation seed roles, such as building or improving laboratories or storage facilities.

In many countries, certification and foundation seed production are carried out completely within the private sector. Putting those activities exclusively in private hands in Sudan at this time, however, is not a viable option because of the present limitations of the private sector seed producers. The government, at the Sudanese seed industry's current state of development, has a role to play in certifying improved seeds in order to guarantee their quality and protect the consumer, and in producing foundation seeds to ensure that seed stocks are available for multiplication.

The project will supply technical assistance to the NSA to improve its managerial and technical capabilities with regard to regulation and certification. Outside experts can advise on ways of overcoming bottlenecks and establishing smooth running procedures in both areas. The government, prior to project authorization, will be required to guarantee that in its regulatory role it will not impede the importation of seeds or plant material apart from the usual checks for plant diseases. Regarding certification, the government will have to agree to carry out surveillance of private sector seed crops on a timely basis so that seeds can be promptly certified. New varieties, whether developed in Sudan or brought in from the outside, should be approved for multiplication after two growing seasons.

As with technical assistance, training for NSA staff will focus on improving the efficiency of regulation and certification activities. The project will provide selected NSA employees with short-term training in Sudan, in neighboring countries and in the United States. The training will focus on skills that will make the NSA a more effective partner of the private sector in developing a modern seed industry.

Procurement of commodities will be used in support of the NSA's regulation, certification and foundation seed functions. It could be used, for example, to supply machinery for field work or to upgrade laboratory equipment. In supplying commodities, the project will pay close attention to what is provided because of the serious problems that recurrent costs, maintenance and spare parts pose for the government. No equipment will be supplied without a firm commitment from the GOS, backed by a financial plan,

that government funds will be provided on an ongoing basis for maintenance and spare parts. Similarly, any renovating or building of facilities to improve the NSA's regulation, certification and foundation seed capabilities will take place only after A.I.D. is satisfied that the GOS will properly maintain the new or upgraded structures.

3. Other Organizations and Government Entities

Improved seeds, once available, will come into widespread use only if farmers believe the seeds are worth the extra cost, get the additional output they are promised, and find the crops grown suitable for eating. To achieve those results, the project will provide local currency support to non-governmental organizations carrying out extension activities. Those organizations will work with private sector producers to test seeds under a wide variety of growing conditions and teach farmers correct cultivation practices. The GOS's Food Research Center in Shambat is available on a contract basis to work with private sector growers to ensure that improved seeds have the proper characteristics to produce food that has a taste, color and texture acceptable to consumers.

## FACTORS AFFECTING PROJECT SELECTION AND FURTHER DEVELOPMENT

### III. A. Social Considerations

1. Context

Agriculture is the most important economic sector in Sudan, employing about 70 percent of the labor force. Agricultural activity is divided among three very different subsectors: irrigated, mechanized rainfed and traditional rainfed. In terms of farmed area, the mechanized rainfed and the traditional rainfed sectors each account for 46 percent of the land under cultivation, with the irrigated sector accounting for the remaining 8 percent. Almost all land brought under cultivation during the past six years has been in the mechanized rainfed sector.

Mechanized rainfed farming is highly capitalized, with farms, usually of several thousand hectares, owned by corporations or wealthy individuals. Farm work is carried out by wage-earning employees, with seasonal labor being hired at weeding and harvesting times. People engaged in agriculture in the traditional rainfed sector are largely small farmers working their own land. They tend to have few financial resources, little access to credit and difficulty obtaining needed agricultural inputs. The irrigated sector is made up of large government-owned agricultural schemes worked by tenants, who are supplied with agricultural inputs by the schemes.

Farmers in the three subsectors have differing access to seeds. In the irrigated sector, the agricultural schemes produce many of their own seeds and supply them to their tenant farmers. The mechanized rainfed farms buy seeds from the PPA and seed importers. Farmers in the traditional rainfed sector, however, usually just set aside a portion of each year's harvest for planting as seed the next season. At present, the improved seed that is available goes overwhelmingly to the mechanized rainfed and irrigated sectors.

2. Beneficiaries

The primary beneficiaries of the project will be the private sector seed producers and the NSA. The private seed growers will receive the technical assistance, training and financing needed to establish themselves as significant producers of improved seeds in Sudan. The NSA, while relinquishing its production role, will have its regulation and certification capabilities strengthened, allowing it to carry out those two functions, on which its responsibilities center, more efficiently.

The secondary beneficiaries of the project will be the farmers of Sudan, who will be able to increase their crop yields, and thus, hopefully, also their incomes, through the increased use of improved seeds. The benefits will differ among the three subsectors. With their better management and good access to funds, mechanized rainfed farmers stand to benefit most from the availability of improved seeds. Mechanized rainfed farms can buy large quantities of seeds at one time and will be sought out by seed producers as preferred customers. The irrigated schemes will benefit to a somewhat lesser degree because they have poorer access to funds than the mechanized rainfed farms and already have a substantial investment in producing their own seeds. Traditional rainfed farmers will also benefit, though less than the other two subsectors, because of their lack of funds, limited knowledge about improved seeds and isolation from seed distribution sources.

Indirect beneficiaries of the project will be all consumers in Sudan. Larger, more consistent crop yields should stablize food prices, which have fluctuated sharply over the past several years, causing great hardship to consumers. Food prices, in general, should be lower relative to what they would have been if improved seeds had not been available. Agro-industry in Sudan will also be helped by having a more assured supply of agricultural produce available for processing.

3. Participation

Participation of beneficiaries in the project should be relatively easy to achieve for farmers from the mechanized rainfed and irrigated sectors. With their greater resources and higher level of organization, those two sectors should respond quickly to the availability of improved seeds. Traditional rainfed farmers will respond more slowly and will be harder to reach, but there is evidence that they, too, would be willing participants in the project.

A study of traditional agriculture in Northern Kordofan conducted in July and August 1984 by researchers from the University of Kentucky showed that traditional farmers were receptive to new technology, when it was available. It was found that farmers in the area surveyed had tried twenty-four new varieties of seeds during the past few years. When a seed was found to be superior (early maturing and high yielding), it was adopted by most farmers in a given village within three years.

As food producers and consumers, women as well as men will benefit from the project. In some ways women will be the main beneficiaries: they are the chief growers of certain crops, such as some types of vegetables, and are responsible for shopping for food and preparing meals. These meal-centered

tasks will be easier to accomplish if food is more readily available at cheaper prices. In the traditional sector, men and women work the land together, the men clearing and preparing the fields and the women planting the seeds. Controlling weeds with the use of small hoes is a joint responsibility. Near the home, women usually plant a small area with cash crops such as groundnuts, vegetables and karkade.

4. Feasibility and Impact

To make sure that the traditional rainfed sector benefits to the greatest extent possible from the project, special efforts will be made to reach traditional farmers. Project development will have to take into account the difficulties encountered in dealing with that sector: the great distances involved, the diverse growing conditions and the lack of technical expertise on the part of the farmers. To help overcome those problems, attention will be given to setting up a widespread distribution network for improved seeds and expanding extension services.

Sustainability will be achieved through putting private sector seed producers on a sound economic footing. They will have their own financial resources, generated by profits, to continue the expansion of seed activities in Sudan.

III. B. Economic Considerations

1. Appropriateness of Project

At present, Sudan's comparative advantage rests in the agricultural sector based on its developed natural resources, available capital stock, and current level of technology. Due to good rains and a substantial expansion in the area planted, total output of cereal crops increased to record levels in the last two years. However, yields are at pitiful levels and are only one-third of Kenya's and less than one-seventh of the United States'. Part of the reason for the poor yields is the lack of improved seed varieties that will thrive under Sudan's climatic and soil conditions.

In the past, the Government of Sudan has been looked on by both local farmers and the donor community as the source for improved seed varieties. Unfortunately, after more than 20 years of activities, the government supplies less than 10 percent of the potential seed market for the most important crop in Sudan, sorghum, and from zero to two percent for all other crops. The seed stocks for groundnuts, sesame, and millet are more than 20 years old.

By increasing yields through the provision of improved seeds, Sudanese farmers will benefit from a greater output from the same level of effort. This will result in an increase in their real income. Yield increases will also free land for other uses if more output of a particular crop is not needed. Additional economic benefits from the project will be the increase in food security for the country, the lowering of the cost of food relative to what it would have been without the project, the potential increase in foreign exchange earnings due to an increase in the capacity to export, and the linkages created with other industries like the feed industry, the food processing industry and the industries supplying inputs to agriculture.

2. Alternative Approaches

The basic goal of the project is to increase the output of agricultural commodities. This could be accomplished in various ways including: greater output of improved seeds; increased access to other agricultural inputs, machinery and extension services; or improved irrigation. The advantage of focusing on seeds is that this will minimize the number of people that will have to be immediately reached by the project but will result in a maximum number of ultimate beneficiaries. The final beneficiaries are consumers, the intermediate beneficiaries are farmers, and the immediate beneficiaries are seed producers. It is more cost effective to reach a small number of seed producers than it is to deliver services to a large number of farmers. Such an approach also minimizes the amount of foreign exchange needed by Sudan to increase agricultural output. Yield increases of from 20 to 30 percent are expected through the use of improved seeds alone without any additional inputs.

There are basically two alternative approaches to increasing the availability of improved seed varieties in Sudan. One is to work through the GOS and the other is to work through the private sector. Because the GOS has performed poorly in the past in providing new seed varieties in adequate quantities and because A.I.D.'s policy is to promote the private sector, the basic approach chosen by this project is to work through the private sector. However, some support will be given to the NSA for certain of its activities including certification, regulating seed imports and exports, and producing foundation seeds.

The private sector has demonstrated an ability to produce seeds, albeit on a limited scale. There are about twelve seed producers who use selected foundation seeds and undertake some approved cultivation practices like roguing. They clean the seeds after harvesting and try to avoid admixture. One of them has their seeds tested and certified by NSA seed specialists. In 1986, these twelve producers cultivated about 850 feddans in order to produce hybrid sorghum seeds, hybrid forage seeds, improved forage seeds and vegetable seeds. At present the private sector is more involved with the distribution of seeds. In a marketing study undertaken for the purpose of this PID, the researchers estimated that there were about 20 seed wholesalers and about 68 retailers in the Sudan, excluding the south. By establishing the Seed Producers Association, the private seed growers have proved their seriousness in expanding their activities.

3. Economic Analysis

Seeds account for less than five percent of the costs of producing most food crops. An improved seed variety can improve yields by a minimum of 20-30 percent if no additional inputs are used and can double or triple output for some varieties if additional inputs, particularly fertilizer, are added. Even though improved seed varieties will cost more, their use is economically justified from a social point of view as long as the increase in real costs is less than the increase in real output.

From the farmer's point of view, a new seed variety will only be adopted if it increases his revenue by more than his costs. Since an increase in output will result in some decrease in price, it is always certain that the adoption of a seed variety by a farmer will be socially justifiable. This is because the increase in real output will always be greater than or equal to the increase in the farmer's revenue. The objective of the project is, therefore, appropriate from an economic point of view.

Various eonomic constraints will have an impact on the potential success of the project. Some of these constraints are peculiar to the seed industry itself while others relate to the overall macroeconomic environment in Sudan. In developing the project paper, particular attention will be paid to constraints posed by the regulatory environment, by an undeveloped marketing and distribution system, by GOS subsidization of public sector seed production, and by the overall macroeconomic environment in Sudan.

a. Regulatory Environment

The GOS is preparing new seed legislation to regulate the seed industry. Some private sector seed producers are concerned that certain aspects of the new legislation will make it difficult for them to operate effectively. An evaluation of the proposed legislation will be undertaken in the project paper.

Seed merchants have complained of delays in clearing seeds from port. Such delays resulted in seeds being delivered after the planting season had passed. Those delays, along with poor storage facilities, resulted in low germination rates during the following season. Some merchants have flown in seeds to avoid the problem, but this is financially unprofitable for many types of seeds. The project paper will examine this problem and make recommendations.

b. Undeveloped Marketing and Distribution System

In the past, private sector seed producers acted as if seeds would sell themselves. Unless the project contributes to the development of marketing and distribution skills, the private sector will do no better than the GOS in supplying the needs of the country. The project paper will propose a training program for marketing and distribution.

There is some question about the adequacy of processing, storage, and packaging facilities for seeds. Some seed producers have indicated that they will locate their operations near existing government seed stations in order to utilize the government's facilities. Whether this is feasible and efficient for all crops and locations will be a question examined in the project paper.

c. GOS Subsidization of Public Sector Seed Production

Private sector seed producers accuse the GOS of subsidizing the cost of seeds produced by the NSA and maintain that a continuation of such subsidization will make it impossible for the private sector to compete for customers. Representatives of the NSA state that they want to leave the

production of certified seeds to the private sector. An evaluation of the NSA's seed pricing policy and its plans for future seed activities will be made in the project paper.

d. Macroeconomic Environment

In an effort to control inflation, the Bank of Sudan has adopted a restrictive credit policy which has fallen disproportionately on the private sector. From December 1982 to September 1986, real credit extended to the private sector fell by 43 percent. The project paper will assess the credit needs of private sector seed producers and the ability of existing financial institutions to serve those credit needs given the Bank of Sudan's restrictive regulations.

Sudan's exchange rate is severely overvalued and has made it almost impossible to profitably export most agricultural exports including sorghum, a crop which offers the best potential seed market for seed producers. Seed producers are primarily interested in growing only hybrid varieties because seeds for open pollinated varieties can be saved from a farmer's own output. Sorghum is the largest crop in Sudan and hybrid varieties are available. In the past two years, Sudan has produced sorghum far in excess of domestic requirements. However, if it is unprofitable to export the crop, market prices will fall dramatically, and farmers will lose interest in growing sorghum. Were this to happen, the potential seed market in Sudan would be seriously reduced. In the project paper, an assessment will be made of what the seed market would be if there were a competitive exchange rate and what it would be if the current overvalued exchange rate were to continue.

The overvalued exchange rate has resulted in a shortage of foreign exchange. This has restricted the private sector's ability to import spare parts, equipment, and agricultural inputs. An assessment of foreign exchange needs for expanding seed output will be made in the project paper.

Besides examining the above economic constraints in the project paper, a cost-benefit analysis will be conducted. The private sector has indicated a willingness to share its data on the cost of producing seeds with the Mission. The NSA has already done so, although their data leaves out several cost components (e.g., interest and management expenses). This data can be adjusted using reasonable assumptions.

III. C. Relevant Experience with Similar Projects

A.I.D. has been actively involved in a number of seed activities in Sudan over the past several years, particularly since the onset of the drought in 1983. These activities have included local procurement, processing and distribution of 7,200 MT of sorghum and millet seeds, importation of hybrid sorghum parental line seeds, overseas procurement of improved groundnut and wheat seeds, importation of hybrid sorghum seeds from the U.S. and Argentina, and financial assistance to two private sector seed producers and the Agricultural Bank of Sudan.

The most significant recent development in the Sudanese seed industry has been the local development of a high yielding hybrid sorghum variety, Hageen Dura

No. 1 (HD-1). A.I.D. contributed to this effort by having 650 MT of HD-1 seed produced in the U.S. and Argentina and by providing technical assistance to the NSA on its hybrid sorghum production program. Bred by the GOS's Agricultural Research Corporation, HD-1 field trials produced yields 85 percent higher than local varieties under rainfed conditions and as much as 300-400 percent more than local varieties in irrigated areas.

Coming onto the market in 1983 just as the drought was gaining intensity, HD-1 received a great deal of attention from both public and private sector seed producers. The area devoted to the production of HD-1 certified seeds went from 45 feddans in 1983 to 2,689 feddans in 1985 before dropping to only 450 feddans in 1986.

There were several reasons for the sharp decline in HD-1 certified seed production. Several other hybrid sorghum varieties were introduced into Sudan around the same time that HD-1 was released. Due to poor promotion and marketing and inadequate extension services, traders and farmers did not differentiate between the various hybrid sorghum varieties but referred to all of them as hybrid. When some of these hybrids did not live up to expectations, it was widely believed that it was HD-1 that had failed to perform, and farmers quickly lost interest in the locally bred hybrid.

A further problem arose when the Agricultural Bank of Sudan (ABS) entered the grain market as a purchaser in early 1986 in order to raise low sorghum prices after a bumper harvest. The ABS bought only sorghum produced from local varieties and refused to purchase any grain produced from hybrid seeds. An ABS circular later reversed that buying policy, but only after great damage had been done to HD-1's reputation.

A third difficulty, which further depressed the price of HD-1, was that though HD-1 was easily ground in modern mills and proved very suitable for making composite flour, it proved harder to grind than local varieties when ground manually in hand mortars or in stone mills, the usual ways of grinding grain in villages. The lesson to be learned from the HD-1 experience is that simply making a new hybrid seed available is not enough to ensure its acceptance and widespread use. There must be adequate marketing and extension, and its food characteristics must be acceptable to local consumers.

The other seed support projects A.I.D. has been involved with were mainly concerned with procuring seeds to make up for lost production because of the drought. During 1984-85, sorghum and millet seeds bought by A.I.D. were distributed in western Sudan, while A.I.D.-procurred wheat seeds were supplied to the irrigated areas of central Sudan.

A.I.D.'s experience in giving financial assistance to two private sector companies to produce HD-1 and other improved seeds was not very successful. The seeds they produced were more expensive than those grown by the NSA and, therefore, at least in the case of HD-1, were difficult to sell. The private sector producers claimed that the NSA was subsidizing the price of its seeds, while the NSA maintained that the private growers' need for higher prices resulted from their inexperience and inefficiency. USAID/Sudan intends to take a close look at the NSA's real costs in producing its seeds and, prior to project authorization, receive guarantees from the GOS that NSA seed prices

will fully recover costs. There should be a free market in seeds, with seed producers free to set their own prices as long as production costs are covered.

III. D. Proposed Implementing Agency

The GOS entity that will be most directly involved in the project is the Ministry of Agriculture and Natural Resources. The Ministry of Agriculture will appoint a coordinator to manage the GOS's participation in the project. To ensure inpartiality in dealing with public and private sector seed producers, the GOS-appointed coordinator will not be from the NSA.

III. E. A.I.D. Support Requirements and Capability

Project management and technical direction will be the responsibility of a direct-hire officer in USAID/Sudan's agricultural division. By the end of 1987, and for the foreseeable future, this division will be staffed by two direct-hire agricultural officers, one local-hire agricultural officer, and two local-hire agricultural assistants. There is a strong possibility that a second local-hire agricultural officer will be hired. The staff projected for the end of 1987, and for some time thereafter, will be capable of managing the project.

III. F. Estimated Costs and Methods of Financing

| Source of Funds:<br>Use of Funds: | AID Grant<br>U.S. Dollars | GOS<br>Sudanese Pounds |
|---|---|---|
| 1. Technical Assistance | $ 2,850,000 | LS 1,450,000 |
| Long Term (72 pm) | (1,150,000) | (750,000) |
| Short Term (NSA) (25 pm) | (500,000) | (200,000) |
| Short Term (Private Sector) (60 pm) | (1,200,000) | (500,000) |
| 2. Training (Short Term/Observational) | 620,000 | 295,000 |
| NSA (54 pm overseas, 36 pm local) | (270,000) | (145,000) |
| Private Sector (60 pm overseas, 30 pm local) | (350,000) | (150,000) |
| 3. Commodities | 3,280,000 | |
| NSA | (280,000) | - |
| Private Sector | (3,000,000) | - |
| 4. Financing Facility | - | 25,000,000 |
| 5. Construction/Renovation | - | 2,800,000 |
| 6. Extension | - | 6,000,000 |

| Source of Funds: Use of Funds: | AID Grant U.S. Dollars | GOS Sudanese Pounds |
|---|---|---|
| 7. Evaluation | 150,000 | 50,0000 |
| 8. Audit | - | 150,000 |
| Subtotal | 6,900,000 | 35,745,000 |
| 9. Contingency (15%) | 1,175,000 | 5,362,000 |
| 10. Inflation (5% FX) (Local inflation cannot be estimated with any accuracy) | 930,000 | - |
| Total | $ 9,005,000 | LS 41,107,000 |
| Rounded Total | $9,000,000 | LS 41,000,000 |

---

GOS local currency contribution from PL 480 and CIP generations. For the GOS contribution, the Sudanese pound amount governs, not a dollar equivalent figure.

III. G. Design Strategy

Upon PID approval, USAID/Sudan will use PD&S funds to bring to the Mission a PP design team composed of an economist, a marketing expert and a seed specialist. The design team will stay for a month, during which time it will gather and analyze information and integrate its contribution into the PP. USAID/Sudan will prepare scopes of work for these specialists. The project committee responsible for developing the PP will be drawn from USAID/Sudan's project, agriculture and economics offices. The services of someone with a project development background either from within A.I.D. or from the outside will be obtained to coordinate and oversee the development of the PP on a day-to-day basis. If coming from outside A.I.D., this person will be paid with PD&S funds.

Project paper design issues are listed in Annex B.

The approximate implementation schedule is:

| | | |
|---|---|---|
| 1. | March 1987 | PID approval |
| 2. | April-May 1987 | PP preparation<br>PIO/T for selecting contractor prepared in final |
| 3. | June 1987 | Project authorized/USAID/Sudan |
| 4. | July 1987 | Grant Agreement signed |

III. H. Recommended Environmental Threshold Decision

A copy of the PID has been forwarded to the REDSO/ESA Regional Environmental Officer for review and preparation of an Initial Environmental Examination (IEE). The IEE will be completed prior to the start of work on the PP, and any guidance it supplies concerning environmental issues will be incorporated into the project paper.

The project does not involve any environmentallly sensitive issues. Seed inputs imported by private sector seed producers will be governed by A.I.D.'s procurement and environmental regulations.

III. I. A.I.D. Policy Issues

The following A.I.D. policy issues need to be resolved:

1. Do private sector seed producers have to pay for services of outside consultants as well as commodities supplied under the project, or may they be given short-term technical assistance and training completely at project expense?

2. What will become of the money in the revolving fund at the end of the project?

3. Is the Bumper's Amendment applicable to the project?

III. J. Gray Amendment Considerations

The PP will take into consideration the use of Gray Amendment organizations for project implementation. They will be considered for use as the contractor, as subcontractors, or as suppliers of technical assistance and training. Before PP design work begins, AID/Sudan will request the AID/W Minority/Small Business Advisor to advise the Mission about the availability of Gray Amendment organizations with expertise in the seed industry.

Annex A

PRELIMINARY LOG FRAME

| | NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATIORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|---|---|---|---|---|
| GOAL | To increase agricultural production in Sudan. | 1. Increased production.<br>2. Import and export of food grain. | 1. Ministry of Agriculture records.<br>2. Ministry of Commerce records. | More and better agricultural inputs available to farmers. |
| PURPOSE | To increase crop yields through the use of improved seeds provided by the private sector seed industry. | 1. Increased production on land using improved seeds.<br>2. Regional Ministries of Agriculture records.<br>3. Ministry of Agriculture records. | 1. Records of individual farmers and farming corporations. improved seed varieties. | 1. GOS continues to import basis agricultural inputs.<br>2. Farmers willing to accept conditions.<br>3. No major adverse weather.<br>4. Project evaluation. |
| OUTPUTS | 1. Private sector growers producing increased quantity of improved seeds.<br>2. More efficient GOS system for seed regulation and certification.<br>3. Increased availability of seeds through improved distribution network.<br>4. Extension services teaching farmers how to use improved seeds. | 1. More private sector improved seeds available on the market.<br>2. Seed regulation and certification proceeding smoothly.<br>3. More farmers have access to improved seeds in more localities.<br>4. Well-organized extension services operating. | 1. Site inspections.<br>2. Consultant reports.<br>3. Contractor reports.<br>4. Evaluations. | 1. Private sector allowed to participate freely in seed production.<br>2. GOS plans to focus its attention on regulation and certification.<br>3. Other donors continue to operate extension services. |

Annex A

PRELIMINARY LOG FRAME

| | NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|---|---|---|---|---|
| INPUTS | Technical Assistance 2.350 Mil.<br>Training .620 Mil.<br>Commodities 3.630 Mil. | 1. Arrival of long-term technical advisor.<br>2. Short-term TA consultancies carried out.<br>3. Private sector growers and GOS staff trained.<br>4. Private sector and GOS receive commodities. | PIO's.<br>Reports.<br>Site visits.<br>GOS project review meetings. | Contractor selected, arrive on time and carries out wor in timely fashion. |

ANNEX B

PROJECT PAPER DESIGN ISSUES

1. To what extent can the Seed Growers Association be developed into an implementation agent for the private sector portion of the project?

2. How will the financing facility making foreign exchange and local currency available to private sector producers for seed inputs be structured, and how will it operate?

3. Where in the Ministry of Agriculture will a coordinator be appointed to manage GOS participation in the project?

Design issues directly related to economics are covered above in Section III.B., Subsection 3, Economic Analysis.