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INTERNATIONAL UNION FOR CHILD WELFARE
UNION INTERNATIONALE DE PROTECTION DE L'ENFANCE
UNIÓN INTERNACIONAL DE PROTECCIÓN A LA INFANCIA
INTERNATIONALE VEREINIGUNG FÜR JUGENDHILFE
الاتحاد الدولي لرعاية الطفولة

650 0045 / 41



1920 - 1946 - 1979
IUCW / UIPE



IYC / AIE
1979



Action
For every child
a tree
Un arbre, un enfant

REQUEST FOR US AID PARTICIPATION

Project Title: Rural Gum Arabic Replantation

Sahel Program of the Jawama Farmers, Sudan

Project Location:

North Kordofan, Sudan, general area of triangle formed by Bara,
El Obeid and Um Ruwaba

PVO Name and Location:

International Union for Child Welfare, Geneva, Switzerland

Central Headquarters:

Box 41, 1211 Geneva 20, Switzerland

Contact Person:

Elsbeth Zurcher and Peter Patzig, Program Coordinator

Date of Submission to US Aid:

22 January 1980

Total OPE Request:

\$ 500,000



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April 3, 1980

ACTION MEMORANDUM FOR THE DIRECTOR

From:  James Graham, Design Officer

Problem: Your approval is required to authorize a grant of \$497,174 from the FN appropriation during FY 1980 to the International Union for Child Welfare (IUCW) for the execution of the Rural Gum Arabic Reforestation Project (650-0045).

Discussion: (A) The IUCW has submitted an unsolicited proposal for a project in Gum Arabic reforestation activities in Northern Kordofan Province. It is expected that approximately 14,000 feddans of land will be replanted with gum arabic seedlings during the initial two years of the activity which will be supported by project funding. The Forests Administration of the Government of Sudan, and the Government of Sudan in general, have indicated support for this project. The project is also consistent with CDSS objectives of directing activities toward traditional agricultural producers located in the lesser developed regions of Sudan--in this case, the West.

The direct beneficiaries of this project will be the 5,600 farm families who will participate in planting gum arabic trees on their land during the initial two years of the project. Also benefitting from the project will be the local Forests Administration, which will be provided refurbished nursery facilities to undertake the technical aspects of the project.

(B) A.I.D. funding for this project will be drawn from the FY 1980 FN appropriation in the amount of \$497,174. A.I.D. funds will be released to cover expenses in FY 1980 and in FY 1981. Such releases will take into account A.I.D. cash management procedures. Additional funding for the project is to be provided by the EEC, Enfants du Monde (Swiss member of IUCW) and the Government of the Netherlands.

	<u>FY 80</u>	<u>FY 81*</u>	<u>Total</u>
Technical Assistance	36,000	36,000	72,000
Commodities	54,800	-	54,800
Other	223,662	146,712	370,374
Total A.I.D.	314,462	<u>182,712</u>	497,174
Other Donors	200,879		334,372
Host Country	<u>304,000</u>		<u>608,000</u>
Grand Total	<u>819,341</u>		<u>1,439,546</u>

*2nd year disbursements related to CP D(2) below.

As the Host Country contribution to the project constitutes 42% of the total, Section 110(a) of The Foreign Assistance Act is satisfied.

(C) Socio-Economic, Technical and Environmental Consideration:

This project has been reviewed and found to be sound from the social, technical, economic and environmental points of view. Construction activities are simple and low cost, and are being funded by other donors. Consequently, 611(a) requirements are satisfied. The most important issue noted concerns the ex-farm price for gum arabic production, which appears currently too low to encourage large-scale participation by farmers. The GOS is in the process of reviewing this price level, and findings will be made available during the first year of the project. The IEE indicates that the project will contribute to soil stabilization by increasing ground cover. There are no issues in Sudan in regard to human rights at this time.

(D) Conditions precedent which have been proposed for this project include: (1) assurances that other donor funding is available, and (2) prior to disbursing 2nd year funds, the Grantee will furnish in form and substance satisfactory to A.I.D., documentation indicating that the GOS has initiated pricing policies designed to increase farmer interest in gum arabic production. Implementation of project activities will be done by the IUCW jointly with Forests Administration officials in the project area. A.I.D. inputs will be monitored from USAID/Sudan. The implementation plan in the project proposal has been reviewed and found to be appropriate.

(E) The Mission Review Committee met on March 6, 1980 and concluded that the projects should be prepared for authorization. A Congressional notification has been transmitted to A.I.D. Washington for submission to Congress.

(F) The USAID employee principally responsible for monitoring of this project is the Agricultural Development Officer.

Recommendation: That you sign the attached PAF II and IEE and, thereby, authorize the proposed project.

PAF II

Part II

Name of Country/Entity - Sudan Name of Project: Rural Gum Arabic
Reforestation
Number of Project: 650-0045

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended and pursuant to Africa Delegation of Authority No. 140, I hereby authorize a grant to the International Union of Child Welfare (IUCW) of not to exceed four hundred and ninety-seven thousand one hundred and seventy-four United States Dollars (\$497,174) to help in financing certain foreign exchange and local currency costs of goods and services required for the project.

The purpose of the project is to provide, through IUCW, funding for a pilot reforestation/gum arabic production activity in the vicinity of Umm Ruwaba east of El Obeid. The project will assist local forestry department agents in furnishing gum arabic seeds and seedlings to local farmers who will plant them on their land in order to regenerate both ground cover through reforestation and gum arabic production.

In the Project, A.I.D. will finance expatriate technical assistance, provision of locally constructed transport for nursery redevelopment, procurement of planting supplies and related material and support for operating costs.

I approve the total level of A.I.D. appropriated funding planned for this project not to exceed the aforementioned Four hundred and ninety-seven thousand one hundred and seventy-four United States Dollars (\$497,174) to be provided during FY 1980.

I hereby authorize the initiation of negotiation and execution of the Grant by the Officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegation of Authority subject to the following essential terms, covenants and major conditions as A.I.D. may deem appropriate.

(a) Source and Origin of Goods and Services

Except as A.I.D. may otherwise agree in writing, all goods and services financed by A.I.D. under this project shall have their source and origin in the Cooperating Country or in countries included in the A.I.D. Geographic Code 941.

(b) Conditions Precedent:

(1) The Project Agreement shall contain a condition precedent to disbursement providing in substance as follows.

The Grantee will furnish, or cause to be furnished, in form and substance satisfactory to USAID, documentation confirming other donor commitments to funding the remaining costs of the five year project.

(2) The Project Agreement shall contain a condition precedent to disbursement of second year funding as follows:

The Grantee will furnish, or cause to be furnished, in form and substance satisfactory to USAID, documentation indicating that the GOS/Gum Arabic Corporation has initiated revised pricing policies designed to increase farmer interest in gum arabic production.

Date

Title

INITIAL ENVIRONMENTAL EXAMINATION

Project Location: Sudan
Project Title: Rural Gum Arabic Reforestation
Funding: \$497,140
Life of Project: Two years
IEE Prepared By: PVO staff (IUCW)
Date: January 22, 1980
Environmental Action Recommended: Negative Determination
Concurrence: R&DSU/EA per Nairobi 5250
Date: March 18, 1980
Executive Decision by Mission Director

Approved _____

Disapproved _____

Date _____

A - PROJECT BACKGROUND

I) History of Proposal Development:

Originally proposed as a [REDACTED], the project's objective was [REDACTED] to have a more [REDACTED] on the fundamental problems of the people as [REDACTED]. Through experience with another IUCW Sahel program in Senegal, and through contact at the provincial level with the people living in the Sudan Sahel, it became clear that [REDACTED] at the village level would be an effective start. Studies made by University of Khartoum as well as those by Social Affairs working groups at provincial level indicated the effect of marginal Sahel existence and the resulting migration of farmers to the cities.

II) IUCW's prior Experience:

IUCW has community development/agriculture training/reforestation programs mainly in Senegal, Cameroun, Peru, Bangladesh and Zaire. IUCW is now conducting a US Aid supported farmers training program in Cameroun. In addition, [REDACTED]

III) Government's Plans Related to Project:

The Sudan has many very well worked out desertification programs which have never been implemented. Many of these are under DECARP (Desert Encroachment Control And Rehabilitation Program), [REDACTED] is part of the Transnational Sahel Green Belt Program (under DECARP) which extends throughout the breadth of Africa, south of the Sahara between 12° - 15° N. This is part of the [REDACTED]

B - PROJECT PURPOSE AND DESCRIPTION

I) Project Purpose and Target Group of Beneficiaries:

The general objectives of the project are to tend [REDACTED] [REDACTED]. Emphasis is placed on increasing the living standard of the people in this arid region which will have the direct effect of tending to stem the tide of migration to the cities and other areas already heavily populated. This will help to secure the future generation of farmers in this area.

Resulting [REDACTED] (1969 - 1975) and from population and animal (cattle, camel, goat, etc.) increases, [REDACTED] of land used for agriculture and grazing, and the [REDACTED] (Acacia Senegal) for firewood are [REDACTED]. Life is very often marginal which means that villagers themselves become marginal as desert encroachment limits grazing areas for animals and depleted agricultural output as soil deteriorates. As life becomes unbearable, entire villages disappear allowing the desertification process to advance further south. Of the 0.5 million population (mainly subsistence farmers of Jawama tribe) benefiting from this project, nearly half are children under the age of 15. The smaller part of the population is nomadic owning large herds of cattle and camels. The Government encourages nomads to settle in this area.

The significance of Gum Arabic to the population of North Kordofan lies not only in the fact that it has been [REDACTED] [REDACTED] and is beneficial to both the producing and consuming countries, but also because it is [REDACTED] providing income to the farmer at a time when it is most needed. Through the years the tree has acquired even greater importance through [REDACTED] [REDACTED] [REDACTED], providing [REDACTED], [REDACTED] and in facilitating further periods of agricultural cropping. It is apparent that the Gum belt of Sudan acts as [REDACTED] between the desert proper in the North and the good agricultural soils in the South.

Any deterioration in this belt will seriously induce severe social-economic and ecological imbalances which explains why the Sudan Government gives high priority to the restocking of the Gum belt.

The proposed project is a [REDACTED] to restore such social-economic and ecological balances and is trying to achieve this in the most direct and simple way; that is by [REDACTED] and full participation of the rural population. The strategy developed for the implementation is merely a [REDACTED] that has been evolved by the farmer himself and that is through the [REDACTED]. Traditionally it is part of the landuse rotation system. The project will provide certain essential inputs (material and extension service) and the local population will execute the project in their private holdings.

In a nutshell the whole idea revolves around the [REDACTED] in preselected [REDACTED] of Northern Kordofan Province, thus, acting as developing centers, [REDACTED] and [REDACTED] to the farmer to restock part of his private holdings with Acacia Senegal trees. This first stage is meant [REDACTED] which will be phased-in as needs and solutions are identified.

The choice of nursery locations has been carefully selected to cover certain inherent problems of the area around it, i.e. each nursery is required to solve specific problems of the area surrounding it which are different from the areas surrounding the other three nurseries. The purpose of choosing four areas requiring four different approaches is that [REDACTED] compared and verified for effectiveness. Ultimately the results can be adopted to corresponding areas throughout the Sahel with only minor variations in application. Variations observed in the four nursery areas are as follows:

[REDACTED] El Ghabsha nursery represents an area with:

- a) serious overcultivation
- b) disappearance of Gum plantations from the rotational crop system

c) high rates of seasonal migration

2. Um Ruwaba nursery:

- a) rich center for Gum production with a trend of overcultivation and degradation and increasing rate of seasonal migration
- b) [REDACTED] (World Bank)

3. El Obeid nursery:

- a) high population center
- b) high migration of villagers to town
- c) concentration of animals during rainy season
- d) disappearance of Gum plantations around the town
- e) signs of desertification

4. Bara nursery:

- a) overcultivation
- b) nomadic tribes
- c) increased desertification
- d) lack of firewood and building poles
- e) disappearance of Gum plantations

?

Although the problems are [REDACTED] from nursery area to another, the objectives to be pursued are the same: the rectification of the social, economic and ecological imbalances.

1) Present social structure of Jawama tribe and how increased income would affect it.

- a) The population living in the Gum producing areas of North Kordofan belong primarily to the [REDACTED] or the [REDACTED]. Although nomads do seasonally pass through the project area, the major part of the population is composed of the Jawama tribe.

- b) The Jawama tribe is dispersed in [REDACTED] and [REDACTED] having varying populations of several hundred to several thousand. Each village has [REDACTED] f. A [REDACTED] council, which may represent one village or several, is made up of men and women members, predominantly men. The village council, in conjunction with the chief, may make decisions and take action in behalf of individuals or for the benefit of the community.
- c) Since the Jawama tribe is [REDACTED], each family may be made up of one male, a number of wives and often a large number of children.
- d) Along with an appropriate village development scheme [REDACTED] of the program) there should be a general [REDACTED] [REDACTED] for the benefit of every family without disrupting the social order which appears to be dictated largely by Islamic doctrine.
- e) One beneficial side effect of increased standard of living [REDACTED] a [REDACTED] a phenomenon observed generally in other countries.

2) What people within the tribe would [REDACTED]

- a) [REDACTED] - It is doubtful if the tribal leaders would benefit most as their position is dependent upon the good graces of the village council which is made up of a general cross-section of the villagers.
- b) Landless - Without a viable community development program, the [REDACTED] from increased income of the villagers.
- c) [REDACTED] - This group [REDACTED] from increased income of the family head. Traditionally women have borne the main burden of an impoverished life in this area, and children

have suffered by weight of their number, associated malnutrition, disease and lack of education. Increased standard of living along with responsible community development activities could only help these members of the community.

3) Land tenure system and size of holdings:

- a) In principle, [REDACTED]
- b) The [REDACTED] of Northern Kordofan have a great deal to say about land ownership within their territorial control, particularly in the case of dispute over land rights.
- c) In actuality the [REDACTED] over their holdings by virtue of [REDACTED] despite the Government's claim that private land does not exist.
- d) The [REDACTED] of a farmer's holdings in the project area is estimated at [REDACTED] (of 4 to 6 hectares).
- e) [REDACTED] tree, no matter how far from the village, [REDACTED], and the acquired right to this claim would be upheld in the courts.

II) General Description of Project:

The overall project is envisaged as an [REDACTED] [REDACTED] taking into consideration fundamental requirements of the population.

[REDACTED] will involve [REDACTED] of the Gum Arabic belt which is almost entirely made up of private holdings and upon which farmers are heavily reliant. Production of Gum Arabic takes place approximately [REDACTED] [REDACTED] During this period production from food crops (sorghum,

millet and sesame) will increase as these crops are intercropped with the enlarged Acacia Senegal (gum arabic) areas. Also the [REDACTED] [REDACTED] Intercropping is not an introduced method. This practice has been used by the farmers of North Kordofan for centuries and is very much a part of the local culture. [REDACTED] after which they can be cut for firewood.

The pattern of [REDACTED] [REDACTED] pose, characterized by cultivation and fallow in which there are Gum Arabic plantions. The term frequently used is the [REDACTED] and is basically a variation of the traditional shifting cultivation. It consists of about 4 - 5 years of [REDACTED] cropping followed by a period of ten to fifteen years of fallow under [REDACTED] regenerated Gum Arabic trees.

As North Kordofan is the largest producing province of Gum Arabic in the Sudan, and as the Sudan produces more Gum Arabic than any other country in the world, the first phase of the project is based on the encouragement of the farmer (through establishing nurseries producing seedlings and extension work) to regenerate this traditional crop on his private holdings which bring not only [REDACTED], but is of direct aid to the farmer in [REDACTED] (Acacia Senegal is nitrogen fixing), [REDACTED] and eventually providing building material and firewood once the trees no longer produce.

[REDACTED] will involve [REDACTED] supply and general community development activities. It is important to note, however, that these general village development activities will be [REDACTED] and that elaboration and even execution of such activities could operate in parallel with Phase I. From past experience it has been learned that the most effective way to develop community development activities is through having someone on the spot, and in direct contact with the rural population. [REDACTED]

III) Conditions Expected at End of Project (Phase I):

1) Short term objectives:

- to provide all-~~_____~~ in rural areas touching the lives of about ~~_____~~, mainly the Jawama farmers of North Kordofan,
- to sl ~~_____~~ from rural areas to areas of high population densities,
- to ~~_____~~ s and grazing areas as Acacia Senegal fixes nitrogen and stabilizes soil. This would reopen traditional agricultural areas as well as open potentially new areas for farmers,
- to p vide ~~_____~~ once the trees no longer produce Gum Arabic,
- to i ~~_____~~ in the rural areas.

2) Long term objectives:

- to create a ~~_____~~ within these presently endangered areas,
- to contribute to ~~_____~~ by reforestation,
- to i ~~_____~~ to keep pace with the world demand (Sudan commands up to 70 % of world production),
- to ensure ~~_____~~ and security of supply,
- to ~~_____~~ of Sudan as Gum Arabic is one of the major cash crops.

C - PROJECT ANALYSIS

I) Economic Effects:

1) Present price of Gum Arabic:

- Price in project area to farmer is [REDACTED]
- Price to Gum Arabic Company (51 % Sudan Government, 49 % private)
[REDACTED]
- World market price is about S£ [REDACTED]

2) Possibility of Gum Arabic market being destroyed by substitutes:

- a) With the advancement of research and technology it is conceded that new alternatives to the use of Gum Arabic were introduced. Some of them have developed into real substitutes and major break-throughs have been made in two main fields - those of the adhesives and textile industries.

It is important to point out that these substitutes have been accepted only in the less exacting industries which do not require good quality. In the other more exacting spheres difficulties do not only include failure to incorporate the same properties as Gum Arabic but also to have competitive prices.

Although Gum Arabic has lost ground in some fields, none of these is completely lost. This partial loss is, however, counterbalanced and even outweighed by the discovery of new uses. Some of them may have a great prospective future.

- b) One of the most important substitutes for Gum Arabic is the starch dextrin which is used in the textile and adhesive industries. It has in this field probably a price advantage over gum and also time and place utilities. Its main disadvantage, however, which makes its future uncertain, is that it is manufactured from food stuffs e.g. rice, potatoes, cassava etc.

In view of the rising world population and food shortages, the opportunity cost may be very high in future which may lead to the decline of the industry or manufacture of synthetic gums.

It appears that unless world population is stabilized and food production is increased there will not be a substantial increase in production of synthetics even if they proved to be successful in all fields.

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c) Another point is that it is now widely accepted that there will be an energy crisis by the turn of the century and consequently a limit to growth in synthetic production. In both cases however, man has to follow a course consistent with nature which means a comeback for natural rather than synthetic products.

3) Effect of project on present price structure:

a) [redacted] that the market [redacted], and assuming that demand [redacted]; it is doubtful if there will be any change in the price structure resulting from additional quantities of Gum Arabic on the Sudan market.

b) The fact that Sudan has in the past supplied up to 80 % of world production (with national income of S£ 10 - 12 million in hard currency) shows its importance. That Sudan's proportion of the world market is declining is not so much that world demand is decreasing, but because of desertification and migration of the Gum Arabic farmers to the cities as well as to the large agricultural schemes like the Gezira.

c) It is conceded that one of the major causes of migrating farmers is the [redacted]. Clearly any means of narrowing the large disparity between the price received by the farmers and the world market price would be a significant incentive for the farmer to grow more. In this respect the [redacted] and the [redacted].

4) [REDACTED]

a) [REDACTED] are held in various centers where bags of Gum Arabic are brought and bid to the highest price by the merchants. In reality, the [REDACTED]
[REDACTED]

b) Another portion (the greater part) of the Gum Arabic crop is already pledged [REDACTED] by the farmers to the [REDACTED] throughout the growing season. Small farmers apparently experience difficulty in freeing themselves from the [REDACTED]
[REDACTED]

c) In 1977, farmers in the area requested the W [REDACTED] to make [REDACTED] to them. A pilot project in Um Ruwaba is said to be working [REDACTED]

In 1979, a consulting agency of the EEC carried out a survey, and from preliminary reports it is believed that small scale cooperative will be recommended allowing the farmers credit and assuming a fixed minimum price. Based on these recommendations, the EEC will probably fund activities along these lines.

5) How the project will affect market mechanism:

? [REDACTED] With the replenishment of Gum Arabic in depleted areas, the farmers should be in a stronger position to deal with the merchants, having the effect of more stable output and return.

b) As mentioned under point 4, it would be [REDACTED] and that cooperative [REDACTED] in which the farmers would have a stake. Financing of such schemes is being considered by the [REDACTED], and the [REDACTED] was a successful pilot project. [REDACTED]
[REDACTED]
[REDACTED]

[redacted] supply. In this sense, the proposed project complements the World Bank efforts.

6) Who would get what financial return from increased production:

- a) Farmers - [redacted] the market. His earning will proportionally increase further with the establishment of cooperatives which will extend loans at reasonable rates and tend to stabilize the market price.
- b) Buyers - No doubt the merchants will earn proportionally more, but not in direct proportion. Their [redacted] who will rely less upon the merchants for credit.
- c) Transporters - As there will be more Gum Arabic to transport, the transporters too will profit by increased volume transfer.

7) Analysis of financial impact of introducing commodities:

a) The purchase of supplies and their introduction to the project area will be [redacted]. The dependence on imported material is not a crucial factor as most material that is necessary would be cement (in relatively small quantities), and in the event of acute balance of payment difficulties, substitutes could be found using local materials (clay and waste material from Gum Arabic). [redacted]

b) The G [redacted] in maintaining the nurseries and associated program mainly because of the national income derived from Gum Arabic.

Re [redacted] rather than construction. Maintenance would require [redacted] and the G [redacted] to undertake this once external

No Way!

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support has ceased.

Also one of the major objectives of the project is to motivate and educate the farmer to be more self-reliant which will result in less dependence on the government nursery program. This example should be self-generating, ie, should spread to other areas not directly under the project's survey.

II) Technology to be used:

[REDACTED] will be introduced by the project that can not be handled by the farmers. The farmers who have cultivated Acacia Senegal for centuries will continue to do so with the exception that in certain instances they may use [REDACTED], or improved seeds instead of seeds gathered randomly.

- 1) Importation of vehicles - One of the features of the project is that it is designed to have a [REDACTED]. If vehicles are not functioning (because of fuel shortages, maintenance problems or non-availability), activity will continue at a reduced scale through the use of animals (mainly camel and donkey) which have been traditionally used in this area as beasts of burden.

It is felt that [REDACTED] when nurseries are being established and there would be a clear advantage if vehicles would be available for transport of seedlings/seed. The main point is that [REDACTED].

- 2) Importation of building supplies, etc. - A clear advantage of this project is that [REDACTED], and the material required externally is [REDACTED] (see annex 4). Local material will be used as much as possible.

- 3) Finding and tapping of water supplies - One advantage of Acacia Senega is that it [REDACTED] once planted in the private

farmer's holdings. In the nurseries, water is necessary only for the establishment of the seedlings. [REDACTED] for the nurseries. Therefore the success of the reforestation phase of the program will not be dependent upon finding further water sources.

Phase II (community development) will attempt to improve water supply in village areas where the problem is acute. Initial activities will include determining ways to collect the run-off of water during the rainy season and appropriate storage. Eventually it is contemplated that after sociological impact studies and geophysical data, that a drilling program be initiated similar to that which is now under way in South Kordofan.

In any case, the success of [REDACTED] activities will take place where settlements have traditional water supplies, if in limited amounts.

III) Sociological Factors:

It has been determined that [REDACTED] Approximately half (or 35 %) of those families have Gum Arabic areas already degenerated or in the process of degeneration. Because of this and resulting desertification and generally low and irregular income, the population tends to leave the land, migrating to large agricultural schemes and cities where the socio-economic level further deteriorates.

The [REDACTED] in the project area [REDACTED] because the success of the project is based on encouraging the farmers to do what they have traditionally done for centuries. As earnings increase and as the desertification process becomes less threatening, the life of all members of the family will be eased accordingly, [REDACTED] generally take the major burden of hardship. Her situation will be further eased in later phases of the project dealing with water supply and general village development which will include community health and family planning.

The project will [REDACTED] by the following means:

- a - Increase in Gum Arabic production [REDACTED] through taxes which should proportionally be reflected in improved services to the people.
- b - [REDACTED] should increase.
- c - [REDACTED] with better quality crops grown in conjunction with Acacia Senegal which stabilizes and improves soil through its nitrogen fixing characteristic.
- d - Higher income for farmers means higher purchasing power.

Harm to interest groups:

The [REDACTED] that would normally migrate to the large agricultural schemes like the Gezira.

IV) Other Considerations of Project:

- 1) [REDACTED] ie, the subsistence farmers of that area. No services are available to these people except occasional contact with health authorities.
- 2) This program would be [REDACTED] developed by the UNEP/UNSO and Sudanese Government. The program would also be part of the Transnational Sahel Green Belt, South of the Sahara.
- 3) The major objective of the program is to [REDACTED] [REDACTED] to revitalize and spread the practice of planting Acacia Senegal in their private holdings. As more and more farmers are involved, an increasing number of family dependants will be exposed and in effect conditioned to carry on this form of

agricultural activity both to approach self-sufficiency and to stem the desertification process.

4) As the Gum Arabic belt extends across all of Sudan, and since the Acacia Senegal is a natural resource growing exclusively in this area (within Sudan), the [REDACTED]

5) The reason for choosing Acacia Senegal over other trees:

a) Acacia Senegal is particularly adapted to the area and one of the few trees that thrives best with a rainfall of 200 to 500 mm/y. Eucalyptus and other fast growing varieties do not grow in this area without irrigation.

b) Acacia Senegal is grown traditionally by the farmers who intercrop it with other crops.

c) Acacia Senegal is a source of cash for the farmer through production of Gum Arabic.

d) Except for growing seedlings, [REDACTED] on.

V) The Institutionalization of Reforestation has a good chance of success:

1) Acacia Senegal has been grown traditionally for centuries and is one of the few trees that grows in this area of limited rainfall.

2) The [REDACTED] responsible for training are part of the Government infrastructure, therefore when the donor support terminates, [REDACTED]

3) Although the initial stages will require [REDACTED] [REDACTED] it is not expected that these vehicles will be necessary in later stages as the activity is ultimately designed to be carried out using work animals (cameis, donkeys) traditionally used in the

region. As structures necessary for the nurseries will have been completed, little additional finances will be necessary after departure of the donor other than maintenance.

- 4) Local support is [REDACTED] to be strong as interest by local farmers is established, and only requires encouragement. Motivation will mainly be profit.

and response of villagers, up to [redacted] [redacted] for [redacted]. Interested farmers will be selected together with the available areas to be restocked or improved and a decision will be taken whether to use seeds or seedlings depending on the state of degradation. It is then possible to draw up a nursery program for provision of seeds and seedlings for the planting season and also to draw up the extension plan for each season separately.

2) Organization of the Staff and Transport Facilities:

Each Forest Ranger will have [redacted] assigned to him; one is mainly responsible for the nursery work and the other for the execution of the work and extension service in the field. With the latter, one local extension officer will be assigned in each selected village. All staff in each nursery will rely on the use of work animals in their movement. [redacted]

[redacted] mainly for the transport of material, nursery work and group travel. Building construction is done by local staff and villagers for the housing of extension and nursery workers.

**WHO?
FUNDS?**

3) Organization of the work and Extension Service:

The work shall be organized mainly through the help of committees. To this effect [redacted]

a) Village level Committee:

1. the Sheikh of the village
2. [redacted]
3. the representative of the S.S.U.
4. the farmers' representative
5. the school teacher (if available)

**DOE HE?
NOW EXIST**

Their responsibility will be:

1. mobilization of the farmers
2. selection and assignment of the planting areas
3. supervising the extension of the work
4. sowing related problems

VERIFY

*(In all extension we will face
many problems without
[redacted] some Re*

5. helping to formulate the development of the Phase II of the program
6. introduction of "Green Education" into schools

Note: Main incentive for the farmers will be the promotion of eventual village development activities.

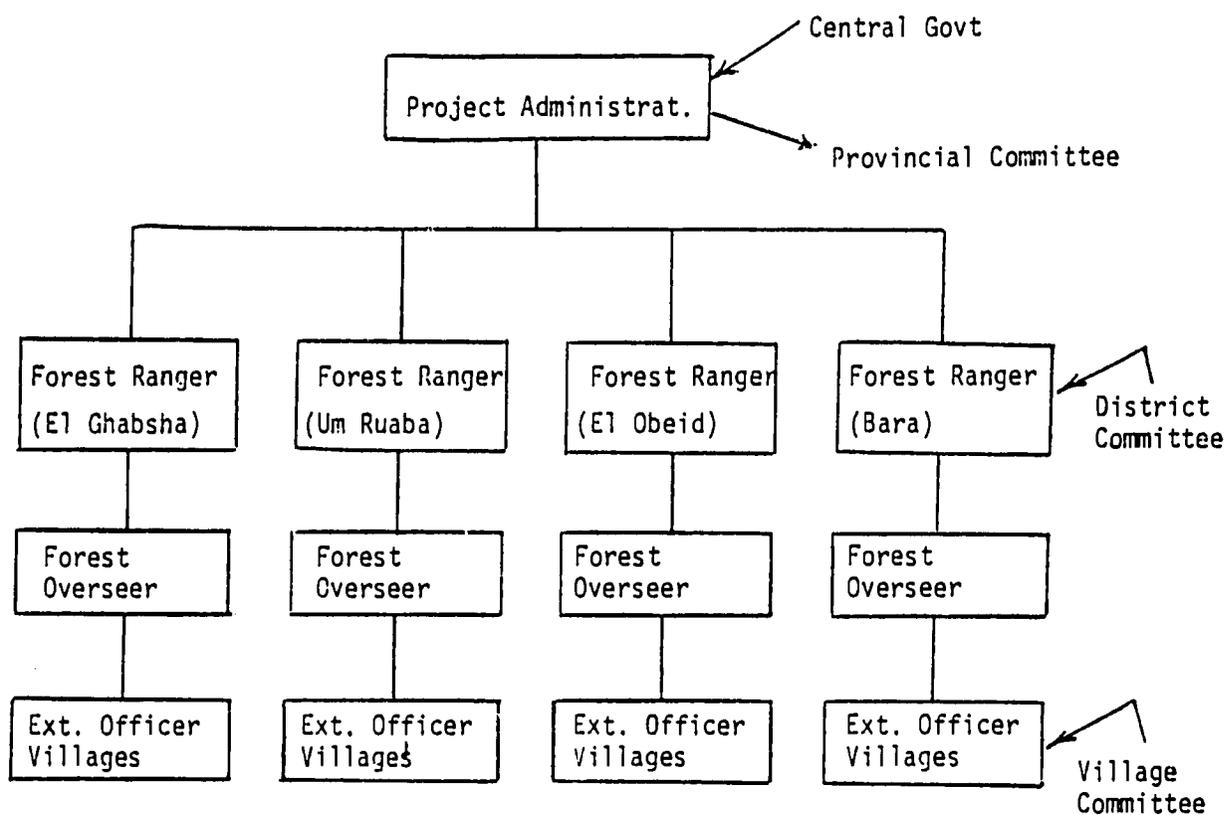
b) District level Committee:

1. the five counterparts in Village Committee (see above)
2. the local administrator or "A. Commissioner"
3. [REDACTED]

c) Provincial level Committee:

1. the Commissioner or his deputy
2. the Project Manager and Project Coordinator
3. Assistant Commissioners for technical aid
4. Representatives of the farmers' unions

The suggested project organization is summarized in the following chart:



4) Criteria for Selection of Villages, Farmers and Sites:

This will be flexible criteria and will be left to the Committees (especially village committee) but a check list is provided as a guideline for the work of these committees, as shown below:

Check list for the Selection of Villages:

Points of consideration	c o n d i t i o n s			remarks
	good	medium	poor	
1. availability of Gum gardens	x	x	x	
2. Growth conditions	x	x	x	
3. Distribution in the area	x	x	x	
4. Stocking in the area	x	x	x	
5. Conditions of pastures	x	x	x	
6. Agricultural production		x	x	
7. Migration of labor	x	x	x	
8. Soil protection	x	x	x	
Solution	Leave as it is, Extension, Conservat.	Enrich + organize Priority No 2	Restock, Priority No 1	

There will of course be many borderline areas as opposed to such clear-cut cases given in the table above, and the final selection is left to the committees to decide taking each case on its own merit. The table also is not exhaustive but other criteria may be added depending on area, local conditions and experience gained.

In addition to the above criteria, for selection of individual farmers and sites, the following will be taken into consideration:

- a) [REDACTED]
- b) selected farmers will be only those who draw their major income from agriculture,
- c) farmers with sufficient family labor,
- d) farmers with secured land tenure authenticated from the Sheikh of the village or the village committee.

) Government Staff assigned to the Program:

[REDACTED] apart from the Project Manager and Coordinator will be drawn from [REDACTED]. The Province has the following staff:

- 1 Conservator of Forests
- 3 Assistant Conservators
- 2 Forest [REDACTED]
- 269 ([REDACTED] for project)
- [REDACTED] ([REDACTED] project)

VERIFY



Each selected nursery area for the project [REDACTED] already [REDACTED] [REDACTED] with the following staff assigned to it:

- 1 Forest Ranger
- 3 Forest Overseers
- a number of skilled and unskilled labor

VERIFY

It is apparent that [REDACTED] therefore only a minimum of movement of staff will be necessary for the project. This staff movement will be restricted to the local extension officers depending on the choice of villages [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

6) Incentive to farmers:

The farmers will be only too willing to restock their areas because [REDACTED] and the forest department with its very limited resources is constantly distributing seeds to farmers on a small scale. Another incentive is that they are going to get seeds, seedlings and extension service free of charge and take an active part in formulating Phase II of the program to develop their own village. Although it would theoretically be more advisable that the farmers pay for seeds and seedlings, it is felt that the farmers currently receive too low a financial return for Gum Arabic to consider purchase. There are [REDACTED] [REDACTED] price [REDACTED] Gum Arabic [REDACTED], and it follows that once there is a positive monetary incentive to plant more Acacia Senegal, the farmers would be willing to purchase improved seeds and seedlings.

The restocking program does not require additional labor or cash and it is designed to be executed by family labor by the use of tangya system (intercropping with other agricultural crops).

7) Evaluation and Follow-up: (also see D - VI)

a) Evaluation and follow-up will be achieved through the [REDACTED] [REDACTED] and a file will be opened for every village plus a [REDACTED] [REDACTED]. The file will contain all the basic information and data about the start and progress of the work. A standard map shall be used and areas covered will be plotted.

b) [REDACTED] of Gum Arabic will indicate if the farmer is increasing his yearly sale and earnings of Gum Arabic.

c) The Department of Social Affairs conducts surveys with good indicators whether or not the standard of living is increasing. Factors such as number of children attending school, diet, dependence on loans, number of work animals, number of tools, cooking utensils and individual lighting sources etc., are indication of the changing living standard. Changing patterns of malnutrition and disease will also be indicative of the success or failure of the program. [REDACTED]
[REDACTED]
[REDACTED] Primary Health Care Program.

Note: At the end of the project period the nurseries will not fall into disuse and they will still be running to provide the same function to restock other areas through the Gum Arabic development programs of the Government. The [REDACTED] costs, which are rather small, will be [REDACTED] the Forest Department.

8) Micro-Economic Analysis for Gum Arabic:

This analysis is being made to show the benefits to the farmer from the project - hence farm-gate prices are used as derived from table 1. The financial and economic cash flows anticipated from the project are computed in table 2.

Comparing expenditures with returns, the project gives a high positive net present worth and a benefit cost ratio of more than one at a 12 % prime rate of interest.

It is important to note here that many of the other quantifiable benefits eg. provision of firewood have not been included in the calculations while at the same time many of the socio-economic and ecological unquantifiables are also not included eg.:

WHY
SO
SURE!



- improvement of soils
- protection of soils
- checking of desert encroachment
- rendering idle land productive
- increase in agricultural production
- improvement of pastures
- creation of employment
- amelioration of climate

To complete the picture, ~~the following table~~ after introduction of Gum Arabic in the Gum cultivation cycle. It shows that Gum Arabic compares very favourably with other agricultural crops and may account for a large portion of the farmer's income in the inactive season at a time when it is most needed.

In conclusion, the project is socially, economically and ecologically feasible.

DERIVATION OF PRICES USED IN FINANCIAL AND ECONOMIC CALCULATIONS

Table 1

for Gum Arabic - Sudan

	Financial	Economic
Estimated price f.o.b. Port Sudan (US \$/t) ⁽¹⁾	1,250.00	1,250.00
Estimated price f.o.b. Port Sudan (LS/t) ⁽²⁾	625.00	625.00
Less: Gum Arabic Co. profit margin (5 per cent of f.o.b.)	31.25	31.25
Less: Royalties	35.00	35.00
Less: Weight loss (5 per cent of f.o.b. price)	31.25	31.25
Less: Stabilisation fund contribution	22.26	-
Less: Agents' commission abroad (2 per cent of f.o.b. price)	12.50	12.50
Less: Duties, taxes and levies ⁽³⁾	42.67	-
Less: Other export expenses ⁽⁴⁾	27.23	27.23
Less: Interest charges (10 per cent for 4 months)	20.83	-
(Total export expenses and profit margin)	(222.99)	(137.23)
Price paid to merchants in Port Sudan	402.01	487.77
Less: Merchant's profit margin ⁽⁵⁾	11.13	11.13
Less: Rail freight to Port Sudan (weighed average)	23.35	23.35
Less: Weight loss (1.5 per cent)	6.03	6.11
Less: Interest charges (13 per cent for 6 months)	26.13	-
Less: Other merchant's expenses ⁽⁶⁾	7.08	7.08
Less: Cleaning weight loss (6 per cent)	24.13	24.13
Less: Sacks ⁽⁷⁾	7.80	7.80
Less: Gibana tax ⁽⁸⁾	4.56	-
Less: Ashur tax ⁽⁹⁾	11.13	-
Less: Local Government taxes ⁽¹⁰⁾	5.11	-
(Total merchant's expenses and profit margin)	(126.45)	(79.60)
Prices at auction market (average) (LS/t)	275.56	408.17
Less: Handling and road transport ⁽¹¹⁾	8.00	8.00
Farmgate Prices (LS/t)	267.56	400.17

(1) Actual price for 1978-1979 season.

(2) Effective rate US \$ 2.00 = LS 1.00.

(3) Development tax, 5 per cent of f.o.b. value - LS 31.25; export duty, 5 per cent of f.a.s. value - LS 10.42 'devaluation tax' - LS 1.00/t.

(4) Demurrages, 1 per cent of f.o.b. value - LS 6.25/t; re-checking quality - LS 1.465/t; Storage - LS 4.72/t; insurance - LS 0.50/t; fumigation - LS 2.00/t; re-weighing by independent companies LS 0.26/t; re-checking, weighing and changing damaged sacks - LS 5.535/t; loading LS 5.00/t; quay dues - LS 1.50/t.

(5) LS 0.50/kantar (1 t = 22.26 kantars).

(6) Storage LS 0.06/kantar; expenses - LS 0.006/kantar; local agent's commission - LS 0.025/kantar; load and handling - LS 0.027/kantar; marking and packing - LS 0.08/kantar; cleaning expenses - LS 0.06/kantar; auction packing expenses - LS 0.06/kantar.

(7) 10 new sacks at LS 0.53 each and 10 second hand sacks at LS 0.25 each.

(8) LS 0.205/kantar.

(9) LS 0.50/kantar.

(10) 'Self-help' - LS 0.0/kantar; 'education' - LS 0.15/kantar.

(11) Average of 60 km at LS 0.10/t km; plus LS 2.00 for handling.

Source: HTS: Western Savannah Development Study 1979, table 30.

Table 2

Cash Flow Analysis for the Project:

(1) Yr	(2) Cost in 1000 S£	(3) Area planted in feddans	(4) Product ion in tons	(5) Farm- gate price in S£	Gross income in 1000 S£	(7) D.F. 12%	P.V. of benefits 1000 S£	P.V. of costs 1000 S£	Net present worth at 12 %
1	450	4,000				0.893		401.9	(401.9)
2	450	6,000				0.797		358.7	(358.7)
3	300	8,000				0.712		213.6	(213.6)
4	250	8,000				0.636		159.0	(159.0)
5	250	8,000	200	268	53.5	0.567	30.34	141.8	(111.4)
6	25		500	268	133.8	0.507	74.37	12.7	54.9
7	35		900	268	240.8	0.452	108.82	15.8	93.0
8	45		1,200	268	321.0	0.404	129.08	18.2	111.5
9	50		1,500	268	401.3	0.361	144.85	18.0	126.8
10	50		1,600	268	428.0	0.322	137.82	16.1	121.7
11	50		1,600	268	428.0	0.287	122.84	14.4	108.5
12	50		1,600	268	428.0	0.257	110.0	12.9	97.1
13	50		1,700	268	454.5	0.229	104.8	11.5	92.6
14	50		1,700	268	454.5	0.205	93.18	10.3	82.9
15	50		1,700	268	454.5	0.183	83.18	9.2	74.0
16	50		1,700	268	454.5	0.163	74.09	8.2	65.4
17	50		1,700	268	454.5	0.146	66.36	7.3	59.1
18	50		1,700	268	454.5	0.130	59.09	6.5	52.6
19	50		1,700	268	454.5	0.116	52.72	5.8	46.9
20	50		1,700	268	454.5	0.104	47.27	5.2	42.1
	2,405				6,070.3		1,509.0	1,446.7	

(1) rotation in 20 years

(2) cost increase to allow for inflation + budget revision

(3) area restocked annually in feddans
(reduced to allow for failures)Benefit-cost ratio: $\frac{1,509.0}{1,446.7} = 1.043$ (4) production of 50 kilos/feddan increasing
gradually to a maximum in year 13

(7) Discount Factor

BUDGET FOR A FAMILY FARM AFTER INTRODUCTION OF ACACIA SENEGAL (FARM SIZE 40 FEDDANS)

Item	Millet	Groundnut	Gum arabic (uncleaned)	Total
(1) Yield (kg/fed)	180 ^{1/}	248. ^{1/}	40	
(2) Acreage (fed)	7	3	20	
(3) Production (t); (1) x (2)	1.26	0.744	0.8	
(4) Price (LS/t)	35	35	250	
(5) Gross Revenue (LS); (3) x (4)	44.1	26.0	200.0	270.1
(6) Gross Revenue (LS/fed); (5):(2)	6.3	8.7	10	
(7) Labour (man days) ^{2/}	126	78	112 ^{3/}	316
(8) Seeds and Tools (LS)	3	5	1	9
(9) Hired labour (LS) ^{4/}	-	-	90	90
(10) Net Revenue (LS); (5) - (8) - (9)	41.1	21.0	109	171.1
(11) Net Revenue (LS/fed); (10):(2)	5.9	7.0	5.5	
(12) Net Revenue (LS/m.day); (10):(7)	0.33	0.27	0.97	

^{1/} as recorded for season 67/68, N. Kordofan
^{2/} see Table 13
^{3/} see Table 13; $162 + 110:5 = 184$; $184 - 72$ (hired labour) = 112
^{4/} It is normal practice, that hired labour is not paid in cash, but on the basis of the half-share-system

Source: Gitec, Germany

II) Phase II (General Community Development Activities):

Although Phase II will be subject to a separate proposal(s), projects will be identified during the course of Phase I.

Availability of water is one of the most serious problems in most areas of North Kordofan. It is a prime factor in nomadic movements and the cause of a thriving water market carried out using tanker trucks on a large commercial scale by private merchants. Many villagers spend their entire year's earnings in order to satisfy the water demand for themselves and their animals. Growing of Acacia Senegal trees fortunately requires no irrigation after the seedlings are planted in the village areas.

The nature of the water problem varies, but the most critical areas are those where shallow wells or bore holes are not possible (lack of aquifer). In these areas, hafirs (ponds collecting run-off during rainy season) are often constructed, but even more critical are areas where the porosity of the soil is too great even for this method. The project would handle the water problem in the following way:

- Examination of past geological data and then possibly conducting a new geophysical study for correlation purpose to determine which areas are suitable for water extraction for water storage. (Arrangement could be made that the geophysical survey and interpretation would be carried out free of charge through Arlab, subsidiary of Compagnie Française de Pétrole, Paris).
- In areas where large diameter shallow wells could be constructed, villagers would be encouraged to establish such wells on a self-help basis. A certain amount of cement will be necessary for the construction of the well lining (casing).
- In areas where bore holes would be necessary, UNICEF (now working in South Kordofan) would be approached to drill these wells, or possibly a separate program using a mobile drilling rig would be established for the area.

- In areas where there is a good quality and quantity of clay, or where the basement complex permits, villagers would be supported in constructing hafirs or underground storage reservoirs on a self-help basis.
- Most important are areas where shallow wells, bore holes or hafirs are not possible. In these areas, investigation must be conducted to determine how underground water storage areas could be constructed using as much as possible local materials (UN efforts in the past using artificial materials as lining have failed due to termite attack).

As water supply and use is a major contributor to disease in North Kordofan, community development activities will begin by demonstrating good hygienic practices surrounding use of water.

Note: The question may be raised as to how developing of local water supplies will be financed. Considerations are as follows:

- a - It should be kept in mind that Phase I is concerned with establishment/re-establishment of the economic base and is not dependent upon the development of water supplies which is subject to a separate proposal.
- b - Phase II (community development) will be introduced after about one year and among other activities will include security of existing water supplies and the development of new sources. Phase I is not interrupted at this juncture.
- c - The development of new water supplies (hafirs, wells, underground reservoirs, etc.) is the most problematic, and mainly dependent on the following:
 - availability and correlation of geophysical data to determine well, hafir and underground reservoir sites: based on the information we have seen, the Rural Water Corporation has accumulated and analysed enough data over the years to determine water source sites.
 - funds, personnel and equipment: using UNICEF's activities in South Kordofan as a model, the project will have a better

idea how to proceed in development of water supplies.

- Based on experience it may well be that only shallow wells should be considered, or that emphasis should only be given to security of existing water supplies

Establishing large numbers of wells may lower water table and dry out existing shallow wells in large areas. New water supplies may also draw large concentrations of farmers, nomads and animals which in the long run would be counterproductive.

Another important community development activity will be the use of energy for cooking. As desertification and increasing population remove bushes and trees, villagers (particularly women) must travel further and further away from the village for firewood. Through the Gum Arabic program, certain areas of Acacia Senegal will always be available for each family for use as firewood. Through education and demonstration and rejuvenation of the farmer's gum gardens, the farmer will have more wood to burn for cooking. In addition, research will be made into creating methane from animal waste or any other organic waste available.

Another very time consuming occupation for women is the grinding of millet and sorghum for making flour. Various devices and methods will be tried to make this task easier. Specifically, hand operated grinding mills and animal driven mill/presses will be tried. Also improved or possibly new methods of food storage will be investigated, as well as wind driven pumps for water

Generally, technology appropriate to the region will be encouraged, taking into consideration culture, the geographical area and local materials.

Another portion of the community development activities will be devoted to agricultural training of farmers. This will be particularly important in conjunction with the Acacia Senegal reforestation program as this tree conditions the soil (by adding nitrogen), and crops (millet, sesame, etc.) have been traditionally planted in the same areas of the trees. This tradition must be revived and encouraged, and positive modifications made, if necessary. It will also be demonstrated to the farmers that raising of animals (goats, donkeys, sheep and camels) should be kept on a limited scale because of the destruction to the surrounding environment. Overgrazing is one of the more important factors causing desertification in this area.

III) Personnel

1) Expatriates:

[REDACTED]
[REDACTED] This person would be responsible for the first and second stage of the program. Aside from administration abilities, the individual would have had experience in establishing and developing programs under similar circumstances as in the Sudan.

note: As Project Coordinator, IUCN has contacted [REDACTED] who has lived at the grass-roots level in the Bara area for 6 months and who has written her thesis in 1977 (Wood for Fuel, Energy Crisis implying Desertification) for the University of Bergen (Norway). She will be responsible for developing Phase II involving community development.

[REDACTED] her husband (trained administrator with experience in Sudan) will be responsible for administrative matters. They agree to work on a one-salary basis.

If necessary, the PVO would supply expertise, but generally would select local personnel having the necessary training.

2) Local Expert:

[REDACTED] for the initial phase maintaining control over the implementation of the program and having both local and government staff directly under his control.

note: The person selected is [REDACTED] who is a trained reforestation expert (Oxford University) and an established expert in Gum Arabic. He is from the project area, familiar with local practices and conditions and is fluent in both English and Arabic.

3) Government Staff, Phase I, first Year:

GoS agricultural extension officers - Through negotiations with the Ministry of Agriculture and the Department of Forestry, it has been officially agreed that a number of Forestry personnel be seconded to the project, as follows:

- GoS personnel are often inactive in their respective fields as the Government is not in a position to fund the execution of their own projects. This jointly sponsored project will allow existing trained Sudanese staff to be active within their speciality and within the area they are already located.
- Once external aid ceases, Government staff will continue to be active toward fulfilling the objectives of the project without additional financial burden to the Government.
- Having GoS personnel working for the project will add little additional financial burden to the external funding agencies as [REDACTED] These include the following:
 - 4 Forest Rangers
 - 8 Forest Overseers
 - 32 Extension Officers
 - 10 Drivers
 - 2 Secretaries
 - 1 Storekeeper
 - 1 Messenger

[REDACTED] including these personnel will be signed in
 the first week of 1980 with the Minister of National Planning
 with copy to the Ministry of Agriculture and Commissioner of
 North Kordofan

Based on the results of recent studies, it is expected that the [REDACTED] of training [REDACTED] throughout the Gum belt of Sudan. In the early stages of the program, no special training is foreseen as these extension officers are already trained, but lack activity (support) for lack of a program. The project does not exclude further training of personnel which will be dictated by performance patterns. In any case, an ongoing training of extension officers will be carried out by the Project Manager.

4) Local Population:

Local participation of farmers will [REDACTED] 240 farmers in the first year. Contribution by the farmers will be mainly in form of labor, tools and work animals. When occasional labor in the nurseries is necessary for the project, local farmers would be engaged.

IV) Management of Resources, Disbursement/Procurement:

The main materials for the initial stages of the program are the following:

- Diesel Fuel: Fuel in general is rarely available in North Kordofan, but diesel is the least difficult. The program [REDACTED] its own fuel to [REDACTED] to make certain of its availability from Khartoum, or Port Sudan. Fuel will be stored on government premises and under the joint control of the project manager and project coordinator.
- Vehicles: It is assumed that all necessary vehicles, trailers, tractors can be brought through Port Sudan, as in the past. Use of vehicles will be under the strict supervision of the project manager with [REDACTED] by all vehicle operators.

- Cement: It is expected that cement (required for nursery construction) can be brought through Port Sudan. Likewise, the amount of cement required for each nursery project will be calculated by the project manager and distributed accordingly. Government storage facilities will be used.

V) How and when inputs would be brought on stream (Phase I):

1) General:

a) GoS personnel:

How: These personnel are ~~already~~ it has been agreed with the Government that they be seconded to the project. Selection has already begun by the Project Manager

When: May 1980

b) Vehicles:

How: Landrovers and tractors would come from following sources:

- ~~rebuilt Government vehicles~~
- rebuilt Government vehicles
- used vehicles in project area

When: Available vehicles will be purchased in early 1980. As the program is not dependent upon vehicles, they can be phased in gradually. Initial work will primarily be renovation of nurseries and not distribution of seedlings.

Note: Trailers (flat bed) can be made locally.

c) Importation of building supplies:

How: Most building supplies (mainly cement) would be purchased locally. Large quantities would not be involved.

When: 1st half 1980

2) Activity Schedule:a) Planned Schedule of Activity is as follows:

<u>Period</u>	<u>Action</u>
Oct 80	<p>Re-establishing El Obeid nursery:</p> <ul style="list-style-type: none"> - replacement of water pump - repair of water pipe system leading to seed-beds - reconstruction of 30 seed-beds - construction of small office/storeroom - fencing around entire complex
Jan - Dec 81	<p>Preparation of 3 other nurseries including the following:</p> <ul style="list-style-type: none"> - Um Ruwaba: - construction 30 seed-beds <ul style="list-style-type: none"> - small house for nursery overseer (local material) - Ghabsha: - installation of deep well water pump * <ul style="list-style-type: none"> - small office/storeroom - house for nursery overseer (local material) - construction of 50 seed-beds <p>* already at the Rural Water Department (El Obeid) and ready for installation.</p> <ul style="list-style-type: none"> - Bara: - reconstruction of large diameter well <ul style="list-style-type: none"> - installation of water pump (small 5 HP Diesel) - construction of 50 seed-beds <p>note: during this year, seed-beds will be brought into operation and extension work will begin at village level. Also villagers will be chosen and contact will be made with specific farmers. Each nursery will plant 1,500 feddans (600 ha) approximately half from seedlings, all on private holdings.</p>

6000 feddans

<u>Period</u>	<u>Action</u>
Jan - Dec 82	Extension work continues at the village areas
January	- seed-beds in nurseries prepared for seed propagation
Jan - May	- establishment of seedlings in nursery seed-beds
May - Aug	- transfer and planting of seedlings in private holdings and sowing of seeds
Aug - Dec	- tending of Gum Arabic areas, supervised by extension officers
	note: above breakdown is typical yearly cycle.
Jan - Dec 83	(same yearly cycle as above) Investigation into possibilities of "flying nurseries", ie, those which could be established adjacent to the 4 main nurseries, serving village areas as yet untouched. Also investigation will be made into village water supply possibilities in areas where the population has to purchase water from water merchants.
Jan - Dec 84	(same yearly cycle as 1982) Based upon investigations, underwater storage areas will be established and experiments will be made in surface water catchment methods. In appropriate areas, consideration will be given to hafir and well construction. Investigation and experimentation will be made into efficient usage of energy for cooking.
Jan - Dec 85	(same yearly cycle as 1982) Further water development and usage of more efficient methods of using local energy for local fuel consumption (cooking), as well as general community development (including health) activities. note: while the implementation schedule dealing with reforestation/rotation crops is rather rigid, general community development (mainly water supply, efficient use of energy, easing women's activities with a special emphasis on family planning and preventive health practices) is allowed a certain flexibility depending upon evolution of the program.

3) Phasing of Annual Planting and Sowing Program

*what is the differentiation
between seedlings & seed?.*

year	feddans in seedlings		feddans in seed		total feddans in seedlings and seeds (4 nurseries)
	1 nursery	4 nurseries	1 nursery	4 nurseries	
1981	750	3000	750	3000	6000
1982	1000	4000	1000	4000	8000
1983	1250	5000	1250	5000	10000
1984	1250	5000	1250	5000	10000
1985	1250	5000	1250	5000	10000
Total:	5500	22,000	5000	22,000	44,000
(in ha.)	2310	9,240	2310	9,240	18,480

note: each feddan requires about 300 trees or 13,200,000 trees for
44,000 feddans.

1 feddan = 1.03 acre = 0.42 hectare

Yearly Cycle:

Month	Activities
January	Seed-beds in nurseries ready for seed propagation
Jan - May	Establishment of seedlings in nursery seed-beds
May - Aug	Transfer and planting of seedlings in private holdings and sowing of seeds
Aug - Jan	Tending of Gum Arabic areas, supervised by extension officers

VI) Monitoring and Evaluation of above Schedule:

The Project Manager will be responsible to see that the schedule of Phase I is followed as closely as possible. In order to directly determine the actual area planted, basic surveying will be conducted in conjunction with plotting areas on a large scale map. Extension officers will also play an important role in maintaining a certain level of activity within their assigned areas.

It appears that the schedule for construction of several small houses small offices/seed-beds is realistic as construction for this project is at a minimum. Even with the introduction of the Sudan timetable factor, operations could begin within the schedule. Many seed-beds already exist which means there would be little excuse for their non-use, even if the overseer's houses and office/storerooms, etc. should for some reason not be completed on time.

Over long term, population migration from villages should be an indicator of the program's impact. Also to be noted would be any change in economic conditions and the general condition of agricultural land areas. A check on the general desertification process would ultimately be verified by satellite photographs.

E - FINANCIAL PLAN

The budget for Phase I is estimated at \$ 1,654,000 over 5 years, not including Sudan Government contribution. For detailed financial plan refer to heading "G". Phase II is subject to a separate budget.

F - CONDITIONS OF PARTICIPATING PARTIES

- 1) Sudan Government has agreed to supply all labor, administrative buildings and available nursery facilities (see agreements, annex 1). Also the established Government Forestry staff will be seconded to the project.

- 2) "Enfants du Monde" (Swiss member of IUCW) agrees to finance the early initial stages in order to see that activity begins (seasonal changes are important consideration for an early start).

EEC has been contacted for funds, as well as the Government of the Netherlands and a number of other organizations.

- 3) Evidence of approval by host country:

- a) Agreement in Principle and Final Agreement are attached (annex 1). The Final Agreement has been submitted in Jan 1980 to the Minister of National Planning, Minister of Agriculture and Commissioner of North Kordofan. Finalization is expected shortly.

- b) Attached article (annex 5) in SAHAFA, National Paper, Issue No 9661 of 25 March 1979 indicating national support of this program.

G - FINANCIAL PLAN, PHASE I, OVER 5 YEARS

1 US \$ = 0.50 Sudan £ (S£)
 1 US \$ = 1.75 Swiss FR (SF)
 1 S£ = 3.50 SF

I) Global Costs of Project Phase I, 1st Year:

a) Contribution of IUCW	US \$	515,341
b) Contribution Sudan Government, estimated	US \$	243,500
c) Contribution of Farmers, estimated	US \$	60,500
		<hr/>
Total value, 1st year	US \$	819,341
		=====

II) <u>Detailed Costs, Phase I, 1st Year:</u>	S£	US
a) <u>Salaries and occasional labor:</u>		
2 experts: 1 Project Manager (local) 2500SF/m plus insurance, travel, etc.: 2000 \$/m		24,000
1 Project Coordinator/ Administrator (Hammer + Digernes = 1 salary) 4000SF/m plus insurance, travel, etc.: 3000 \$/m		36,000
Hardship allowance for GoS staff	2,640	5,280
Travel allowance + overtime GoS staff	4,500	9,000
Driver's hardship + overtime	2,400	4,800
Occasional labor, 4 months/40 pers.	3,200	6,400
		<hr/>
Total Salaries PVO, 1st year		85,480
		=====
Salaries paid by GoS for staff, estimated	63,000	126,000
Farmers' contribution in work days, estimated		48,000

b) <u>Buildings and Constructions for</u>	S£	US \$
<u>4 tree nurseries:</u>		
<u>El Obeid</u>		
1) office/storeroom (1 building)		
local bricks, labor and cement	600	1,200
2) 30 seed-beds à 10 S£	300	600
brick columns	200	400
3) El Ain, 20 seed-beds à 10 S£	200	400
shade, roof support	50	100
4) Simerh, 20 seed-beds à 5 S£	100	200
<u>Um Ruwaba</u>		
1) house for nursery staff,		
traditional construction	100	200
2) 30 seed-beds à 10 S£	300	600
shade structure	60	120
<u>Ghabsha</u>		
1) office/storeroom (1 building)	600	1,200
2) 5 houses for nursery staff,	500	1,000
traditional construction		
3) 50 seed-beds à 10 S£	500	1,000
shade and brick columns	400	800
<u>Bara</u>		
1) reconstruction of well (10 meters)	300	600
2) 50 seed-beds à 10 S£	500	1,000
3) shade structure, roof support	120	240
<u>Villages</u>		
1 house/village or 5 houses/nursery,		
20 houses à 30 S£,		
for extension officers, traditional		
construction	600	1,200
 Total Buildings and Construction PYO:	 5,430	 10,860
		=====
Government contribution in existing buildings, est.		30,000

c) <u>Vehicles and Machinery:</u>	S£	US \$
(all prices are indicated exempt from Gov. tax)		
5 Pickup Landrovers & 1 Station LR @ 7,200	43,200	86,400
3 Tractors (medium Ford)	6,000	18,000
6 Trailers	2,000	12,000
6 (1000 liter) Tanks	450	2,700
20 Carts	150	3,000
1 (5000 liter) Tanker lorry Daf	16,000	32,000
1 Pump 5 HP Liester	550	1,100
		<hr/>
Total Vehicles and Machinery PVO:	95,450	190,900
		=====
Government contribution in existing vehicles and machinery, incl. pumps, est.		60,000
d) <u>Equipment:</u>		
Office HQ El Obeid (2 typewriters, calculators, etc.)		900
Survey equipment (hand held prismatic compass, steel measuring tape, maps, etc.) 4 sets		1,500
Radio communication set (1 central, 3 stations)		8,600
2 Bicycles	200	400
Tools and extension material	1,000	2,000
Household items for coordinator/administrator	3,000	6,000
		<hr/>
Total Equipment PVO:		19,400
		=====
Government contribution for equipment, est.		7,500
Farmer's contribution for tools, est.		500

e) <u>Material and Running Costs:</u>	S£	US \$
Polythene bags (1 million)	2500	5,000
Seeds (5000 kg)	2500	5,000
Office material and PTT	1,000	2,000
2 Rents of houses for experts	3,000	6,000
Transport:		
Fuel: 42,000 l at 0.25 S£/l *	10500	21,000
50 Fodder allowances à 3,5 S£/month	2,100	4,200
Material airfreight Khartoum-EI Obeid	1,000	2,000
Insurance vehicles: 6 LR	3,000	6,000
1 Tanker lorry	800	1,600
25 % spare parts and maintenance of total item c) 190,900		47,725
		<hr/>
Total Material and Running Costs PVO:		100,525
		=====
Government contribution for material and running costs, est.		20,000
Farmers' contribution for work animals, est.		12,000
Total PVO: a) Salaries and occasional labor		85,480
b) Buildings and Construction		10,860
c) Vehicles and Machinery		190,900
d) Equipment		19,400
e) Material and Running costs		100,525
		<hr/>
		407,165
5 % unforeseen		20,358
Coordination Geneva: salary, field trips, etc.		20,600
15 % Administration, incl. preparation work		67,218
		<hr/>
Grand Total PVO 1st Year, Phase I:		515,341
		=====

* 150 km/day = 35 L x 300 days x 4 nurseries

Total Government:	a) Salaries	US \$ 126,000
	b) Buildings	30,000
	c) Vehicles and Machinery	60,000
	d) Equipment	7,500
	e) Material and Running Costs	20,000

Grand Total Government 1st year, est.:		243,500
		=====
Total Population:	a) Farmers Labour	48,000
	d) Equipment	500
	e) Material and Running Costs	12,000

Grand Total Population 1st year, est.:		60,500
		=====

Note: 15 % administration is applied to total yearly PVO program expenditures + 5 % unforeseen + coordination.

III) Estimation of Costs for 2nd Year, Phase I, PVO Contribution:

	US \$
a) Salaries:	
3 Experts (2 on a 1-salary basis) 5,500/m	66,000
Local labor	6,400
Hardship, travel allowance and overtime	20,000
b) Buildings and Construction:	---
c) Vehicles and Machiner :	---
d) Equipment:	
Audio-visual equipment for extension work	6,000
e) Material and Running Costs:	
Polythene bags	8,000
Seeds	8,000
Rent for houses experts	6,000
Office material	2,000
Transport:	
Fuel: 30,000 l at 0.25 S£/l (100 km/nursery)	15,000
70 Fodder allowances	5,880
Insurance vehicles	7,600
25 % spare parts and maintenance	47,725
	<hr/>
	198,605
. 5 % unforeseen	9,930
. Coordination Geneva:	20,600
. 15 % administration costs	34,370
	<hr/>
Total	263,505
. 20 % inflation	52,700
	<hr/>
Grand Total 2nd Year	316,205
	=====

IV) Estimation of Costs for 3rd Year, Phase I, PVO Contribution:

	US \$
a) Salaries:	
1 Expert (coordinator CD under separate budget Phase II)	36,000
Local labor	5,000
Hardship, travel allowance and overtime	24,000
b) Buildings and Construction:	---
c) Vehicles and Machinery:	---
d) Equipment:	
Camping equipment for "flying nurseries"	6,000
e) Material and Running Costs:	
Polythene bags (½ borne by GoS)	4,800
Seeds (½ borne by GoS)	4,800
Rent for house expert	3,600
Office material	2,400
Transport:	
Fuel: 24,000 l at 0.30 S£ (75 km/nursery)	14,400
100 Fodder allowances	10,000
Insurance vehicles	9,120
25 % spare parts and maintenance	57,270
	<hr/>
	177,390
. 5 % unforeseen	8,870
. Coordination Geneva:	25,000
. 15 % administration costs	31,690
	<hr/>
Total	242,950
. 20 % inflation	48,590
	<hr/>
Grand Total 3rd Year	291,540
	=====

V) Estimation Costs for 4th Year, Phase I., PVO Contribution:

	US \$
a) Salaries:	
1 Expert	40,000
Local labor (borne by GoS)	---
Hardship, travel allowance and overtime	24,000
b) Buildings and Construction:	---
c) Vehicles and Machinery:	---
d) Equipment:	---
e) Material and Running Costs:	
Polythene bags (borne by GoS)	---
Seeds (borne by GoS)	---
Rent for house expert	3,600
Office material	2,400
Transport:	
Fuel: 14,400 l at 0.50 S£ (50 km/nursery)	14,400
100 Fodder allowances (½ borne by GoS)	5,000
Insurance vehicles	9,120
25 % spare parts and maintenance	57,270
	<hr/>
	155,790
. 5 % unforeseen	7,790
. Coordination Geneva:	25,000
. 15 % administration costs	28,287
	<hr/>
Total	216,867
. 20 % inflation	43,373
	<hr/>
Grand Total 4th Year	260,240
	=====

VI) Estimation of Costs for 5th Year, Phase I, PVO Contribution:

	US \$
a) Salaries:	
1 Expert	40,000
Local labor (borne by GoS)	---
Hardship, travel allowance and overtime	24,000
b) Buildings and Construction:	---
c) Vehicles and Machinery:	---
d) Equipment:	---
e) Material and Running Costs:	
Polythene bags (borne by GoS)	---
Seeds (borne by GoS)	---
Rent for house expert	4,000
Office material	2,400
Transport:	
Fuel: 14,400 l at 0.60 S£ (50 km/nursery)	17,280
100 Fodder allowances (borne by GoS)	---
Insurance vehicles	10,000
25 % spare parts and maintenance	65,000
	<hr/>
	162,680
. 5 % unforeseen	8,134
. Coordination Geneva	25,000
. 15 % administration costs	29,372
	<hr/>
Total	225,186
. 20 % inflation	45,037
	<hr/>
Grand Total 5th Year	270,223
	=====

VII) Total Input by PVO over 5 Years:

1st year	515,341
2nd year	316,205
3rd year	291,540
4th year	260,240
5th year	270,223
	<hr/>
Total, incl yearly inflation:	1,653,549
	=====

VIII) Yearly Estimated Running Costs for GoS from Year 6 on:

Polythene bags	10,000
Seeds	10,000
Office material	2,400
Fuel: ($\frac{1}{2}$ of original vehicles)	10,000
100 Fodder allowance	10,000
Insurance: GoS vehicles are not insured	---
Maintenance and spare parts	30,000
Occasional labor	5,000
Hardship, travel allowance, overtime	24,000
	<hr/>
	101,400
Miscellaneous 10 %	10,140
	<hr/>
Total	111,540 *
	=====

* This figure excludes GoS salaries which the GoS would have to pay whether or not the project existed.

H - SUGGESTED INPUT BY US AID

I) <u>1st Year, Phase I:</u>	US \$
Item II - a)* Salaries and occasional labor	85,480
Item II - c) Vehicles and Machinery:	
6 trailers (locally made)	24,000
6 tanks " "	5,400
20 carts " "	6,000
Item II - d) Equipment	19,400
Item II - e) Material and Running Costs	100,525
	<hr/>
	240,805
. 5 % unforeseen	12,040
. Coordination Geneva	20,600
	<hr/>
	273,445
. 15 % administration costs	41,017
	<hr/>
Total 1st year	314,462
	=====

* Refer to detailed items in budget

II) 2nd Year, Phase I:

Item III - a) Salaries and occasional labor	92,400
Item III - e) 40% of Material and Running Costs	40,000
	<hr/>
	132,400
15 % administration costs	19,860
	<hr/>
	152,260
20 % inflation.	30,452
	<hr/>
Total 2nd year	182,712
	=====

Notes:

- a) We consider this equipment (particularly vehicles) the theoretical optimum that could be expected to be on project site and operational. Clearly all equipment will not be on site on schedule, but the project is flexible enough to absorb these deficiencies and still be productive. For example, we understand that it would require approximately one year to have a Landrover delivered to El Obeid via Port Sudan. It would be advisable under such difficult delivery/transport conditions to purchase locally as much as possible. Because of the difficulties of transport and supply, some of this equipment will be purchased second-hand or manufactured locally.
- b) From year 2 on, the project needs less fuel and increased fodder allowance.
- c) From year 4 on, seedlings and improved seeds could be sold to the farmers to help offset running costs.

I - LIST OF ANNEXES

Annex 1 : Agreement in Principle and Final Agreement

Note: the Forest Department and the Gum Arabic Division are part of the Ministry of Agriculture, Food and Natural Resources in Khartoum.

Annex 2 : Map of Sudan

Annex 3 : Map of project area

Annex 4 : Detailed construction plans

Annex 5 : Article from SAHAFA (Sudan newspaper)

Annex 6 : DECARP (Desert Encroachment Control And Rehabilitation Program)
if necessary, copy available at IUCW Secretariat

Annex 7 : "Restocking of the Gum Belt of Sudan", report by Hag M. Awouda,

Annex 8 : Curriculum vitae Hag M. Awouda, Project Manager

Annex 9 : "Wood for Fuel, Energy Crisis Implying Desertification", by
Turi Hammer ... if necessary, copy available at IUCW Secretariat

Annex 10 : Curriculum vitae Turi Hammer and Olav Digernes, Project Coordinator and Administrator

Annex 11 : Photographs

Annex 12 : Initial Environmental Examination

A n n e x 1 : Agreement in Principle and Final Agreement



1920 - 1946 - 1979
IUCW / UIPE



IYC / AIE
1979



Action
For every child
a tree
Un arbre, un enfant

Khartoum, 2 December 1978

Agreement in Principle

The Department of Forestry (Democratic Republic of Sudan) and IUCW (International Union for Child Welfare, Geneva) agree in principle to collaborate on a program involving restocking of the Gum Arabic belt in North Kordofan as well as the associated extension activities. This program will aid in the long term propagation of Acacia Senegal as a form of desert control and will be of direct benefit to the rural population now under pressure from desert encroachment.

Director of Forestry Administration:

Sayed A.A. Bayoumi

Head of Gum Arabic Division:

Sayed H.M. Awouda

IUCW Consultants:

Peter R. Patzig

Elsbeth R. Zurcher

GENERAL AGREEMENT OF TECHNICAL COOPERATION
BETWEEN
THE GOVERNMENT OF THE DEMOCRATIC REPUBLIC OF SUDAN
AND
THE INTERNATIONAL UNION FOR CHILD WELFARE

(in English only)

PREAMBLE

- Considering that the Government of the Democratic Republic of Sudan encourages the efforts of non-governmental organizations,
- Considering that projects initiated by the IUCW since 1972, upon the request of the Government of the Democratic Republic of Sudan, are aimed at promoting the technical cooperation intended to enhance the general well-being of the Sudanese people, and are in line with governmental policy,

the two parties agree to the following :

Article 1

The IUCW will undertake to approach all international financial channels with respect to any project geared towards integrated development submitted to it by the Government of the Democratic Republic of Sudan.

Article 2

Should the necessary support for these projects be found at international level, IUCW assistance would, upon the request of the Government of the Democratic Republic of Sudan, take the following form :

- to put at the disposal of the Government of the Democratic Republic of Sudan the necessary personnel to carry out the objective. IUCW will be responsible to cover the salaries of these personnel as well as social security, travelling expenses to and from Sudan, as well as other associated expenses.
- participate in studies, fund raising and practical operation of the projects.
- to cooperate in all matters to fulfil the original objective decided upon by both parties in relation to projects or operations directed towards integrated development in the Sudan.

Article 3

IUCW will utilize its international contacts and other means to stimulate interest and support with respect to the programs or associated activities in direct relation to preparation, implementation and management. External financial support obtained by IUCW will be assigned directly to programs, and the accounts of the expenditure of these funds will be available for auditing as and when required.

IUCW will act as a center of information exchange for all organizations interested in supporting the same efforts.

IUCW will assist the Government of the Democratic Republic of Sudan to improve services in support of the population and to create imaginative approaches to solve their problems.

IUCW ensures the compliance of its staff with an abidance by the laws and regulations of the Democratic Republic of the Sudan.

Article 4

The Government of the Democratic Republic of Sudan will ensure that:

- a) Priority is given to engaging Sudanese staff within the framework of the projects.
- b) Material, vehicles, furniture, technical equipment, etc. which are necessary for the implementation of projects are exempted from customs duties.
- c) All IUCW staff (under IUCW contract), employed within the Sudan, are exempted from income tax.
- d) All salaries and social security charges, etc. of Government staff are defrayed by the Government.
- e) Upon completion of any project, all running costs and/or overheads will be covered by local authorities or the Government itself.
- f) - On the basis of existing Sudanese legislation, the IUCW's work on any given programme is facilitated as far as possible.
- IUCW is provided with the necessary facilities as regards the conversion of foreign currency into local currency using the legal exchange rate.
- g) All applications for visas and resident permits from non-Sudanese subjects, under IUCW contract, are accorded.
- h) All non-Sudanese subjects and their dependents are allowed to import their personal effects without customs charges or any other restrictions.
- i) Non-Sudanese subjects and their dependents, under IUCW contract, are protected under Sudanese law. It assumes the responsibility for any damage caused by the latter in the course of their duties, unless the damage caused is intentional or the result of negligence.

Article 5

Whenever IUCW has secured external funds for a project, the two parties agree to the following :

- a) IUCW assures that the handling of funds conform to the objectives of the projects for which they are intended.
- b) Allocation of expenditures and disbursements are managed by IUCW.
- c) The request for allotment of funds will be determined by those Sudanese authorities concerned with the programmes and submitted to the IUCW.

Article 6

In case of disagreement between the Government of the Democratic Republic of Sudan and the IUCW concerning the interpretation and application of the present overall agreement as well as any additional agreements, should it prove impossible to come to an amicable agreement or to settle the matter in a way which is acceptable to both parties, then this matter will be referred to Swiss jurisdiction.

Article 7

The parties agree to meet periodically in order to assess the results obtained as the projects proceed.

Article 8

The present agreement is valid for a period of two (2) years as of the date of signature by the Government of the Democratic Republic of Sudan and the IUCW.

This agreement will automatically be renewed at the end of the period indicated above, unless one or other of the parties wishes to amend or cancel it, indication of which should be given in writing at least three (3) months before the agreement is due to expire.

Signed in Khartoum,

For the Government of
the Democratic Republic
of Sudan

For the International Union for
Child Welfare

AGREEMENT OF TECHNICAL COOPERATION

BETWEEN

THE GOVERNMENT OF THE DEMOCRATIC REPUBLIC OF SUDAN

AND

THE INTERNATIONAL UNION OF CHILD WELFARE

(in English only)

Preamble:

- Considering the DECARP (Desert Encroachment Control And Rehabilitation Program) studies which the Sudan Government concluded in 1976 indicating the immediate necessity to control desertification south of the Sahara,
- Considering that under DECARP, one of the conclusions was the instatement of an Acacia Senegal (Gum Arabic) reforestation program to help stop desertification as well as to raise the economic standard of those people living in the marginal areas,
- Considering that the Sudan Government now places special emphasis on reforestation programs and associated community development programs in the areas under pressure from desertification,
- Desiring to establish cooperation toward these goals, the following parties, for an initial 5 year period, have agreed to coordinate their activities:

- 1 - International Union of Child Welfare
- 2 - Ministry of National Planning
- 3 - Ministry of Agriculture, Food and Natural Resources
- 4 - Province of North Kordofan

Commitment of the above mentioned parties are defined as follows:

Part I

1) The International Union of Child Welfare shall:

- a. Assist materially in the establishment and renovation of 4 nurseries for the propagation of Acacia Senegal within the rough triangle formed by Bara, El Obeid and Um Ruaba.
- b. Provide transport facilities for the decemination of seedlings and seeds from each of the nurseries. This will also include the fuel and fodder allowance for work animals.
- c. Provide equipment where none exists (or where none is allocated) for the operation of the nurseries and in the village areas where seedlings are to be planted and where extension activities are to take place.
- d. Provide funds for the travel allowance, overtime and casual labor, where necessary.
- e. Provide for spare parts, maintenance and repair of vehicles.
- f. Provide funds for the Project Manager (El Hag M. Awouda) who will be seconded from the Ministry of Agriculture for full time employment on the project, having full responsibility over operations and maintaining liaison with the Ministry of Agriculture and the provincial authorities on this and related projects.
- g. Provide for a Project Coordinator who will be responsible for maintaining liaison between the project and IUCW Geneva and who will also be responsible for general administration of the project. The coordinator will also be responsible for developing Phase II of the project connected with water supply and general community development activities.

- h. Provide transport for the Project Manager and Project Coordinator as well as housing.
- i. Provide air transport for transfer of goods, when necessary, as well as to cover the cost of handling goods connected with the project.
- j. Provide funds for office expenses, postal expenses, stationary, water, electricity, etc.

2) The Ministry of National Planning shall:

- a. Provide waiver of customs duties on imported goods. (Provided that if such imported goods, including machinery, shall be subject of customs duties and taxation whenever sold or disposed of commercially, unless sold with the consent of the government to organizations or individuals enjoying similar duty-free privileges.) Also provide expatriate staff exemption from all income tax.
- b. Settle all residence permit formalities for expatriate staff.
- c. Allow priority in transport and acquisition of imported goods and fuel directly connected with the project.
- d. Provide funds for light nursery tools.
- e. Provide funds for supply of seed.
- f. Provide funds for fencing material.
- g. Provide offices for Headquarters at El Obeid; or provide funds for rent.

3) The Ministry of Agriculture shall:

- a. Provide technical advice
- b. Coordinate activities between the project and related activities carried out by the Ministry.

- c. Assist in purchase of local materials necessary for the project.
- d. Provide secondment of the following staff for each nursery:
(all staff will be working totally for the project and only under the jurisdiction of the Project Manager)
 - one Forest Ranger
 - one Forest Overseer
 - eight workers (for extension work and labor)
 - two drivers

As the project extends, more nurseries will become functioning requiring further staff.

4) The Province of North Kordofan shall:

- a. Provide land and water, when necessary.
- b. Provide staff, when necessary, for the function of the project (Headquarters El Obeid):
 - two drivers
 - one secretary
 - one messenger
 - one storekeeper
- c. Provide housing and office facilities including telephone, etc. for provincial staff.
- d. Facilitate matters concerning provincial legislation, and the issuance of local orders, when necessary, for the success of the project.
- e. Give priority to the procurement of fuel and cement and other materials to assure the continuity of the project.
- f. Help to inform the farmers of the intended project.

Part II

Furthermore, the parties agree as follows:

- a. No party to the agreement shall be held liable by any other party for the compensation arising from death, disability or other hazard suffered an employee or employees of any other party as a result of their employment on work financed under the program agreed upon by the parties.
- b. Should any dispute arise as to the interpretation, operation or any other aspect of this agreement, all parties shall make all endeavour to reach an amicable solution.
- c. Any program, such as water supply or community development, as may be subsequently mutually be agreed upon and therefore attached and signed as Annexes, shall be implemented in accordance with this agreement.
- d. This agreement may be modified by mutual consent between the parties through the exchange of official letters.
- e. Upon signature, this agreement shall enter into force and remain in force for a period of one year, renewable yearly. Three months prior to the expiration date, the parties (the Ministry of National Planning and the International Union of Child Welfare) shall consult considering the prolongation or renewal of this agreement. This can be done by simple exchange of letters. The Ministry of Agriculture and the Province of North Kordofan will receive copies.
- f. It is understood that activities will be phased according to availability of funds, and that some time may elapse before full implementation of the program.

Date:

For the Democratic Republic of Sudan:

Ministry of National Planning:

Name and Signature:

Title:

Place:

For the International Union of Child Welfare:

Name and Signature:

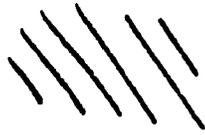
Title:

Place:

cc: Minister of Agriculture, Food and Natural Resources, Khartoum

cc: Commissioner of North Kordofan

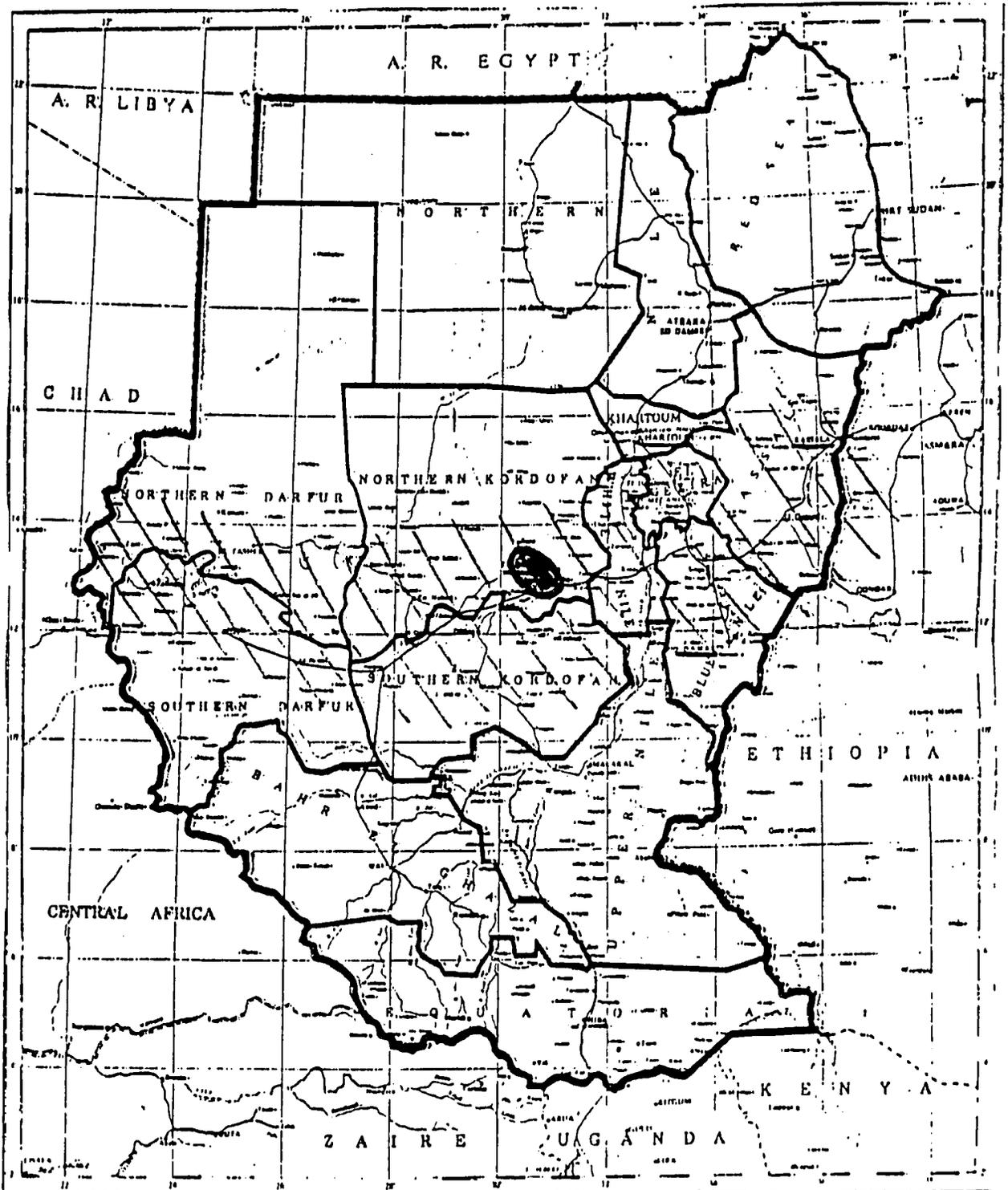
A n n e x 2 : Map of Sudan



Region touched by the "Green Belt", covering the semi - arid areas of the Sahel countries, from Senegal to Ethiopia



Area of pilot program "Restocking of Gum Arabic"

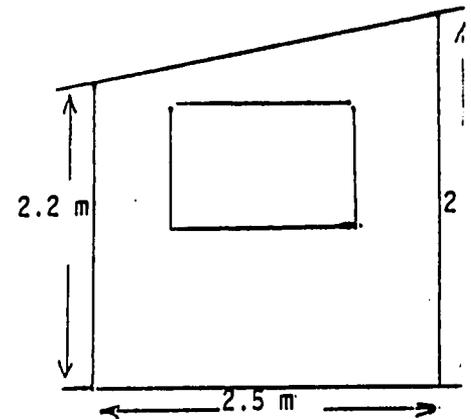
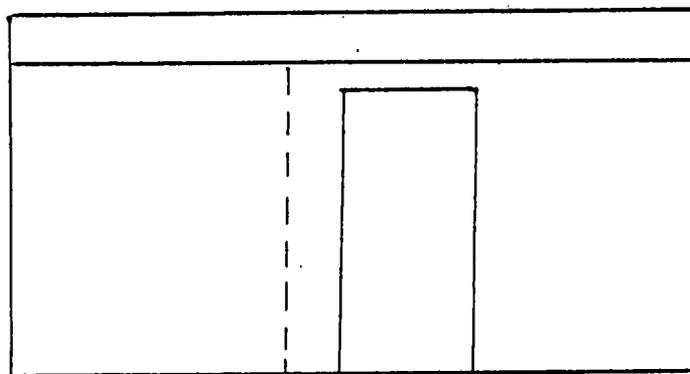
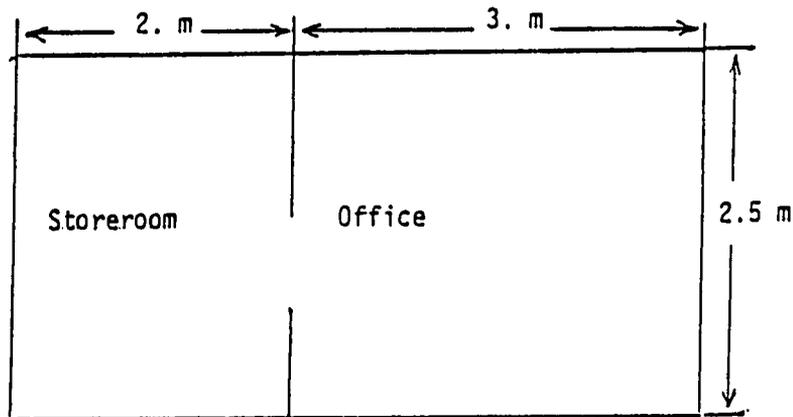


A n n e x 3 : Map of project area

A n n e x 4 : Construction plans

Standard Office/Storeroom Building

2 such buildings will be required, one in El Obeid nursery, one in Ghabsha nursery.



Costs per building:

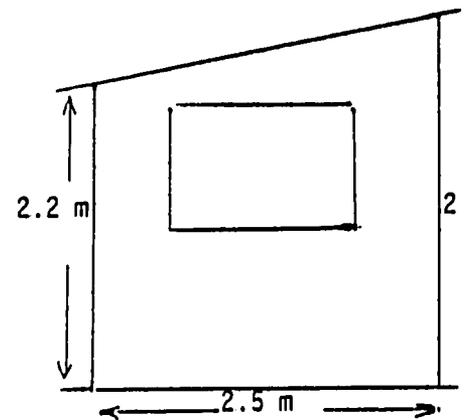
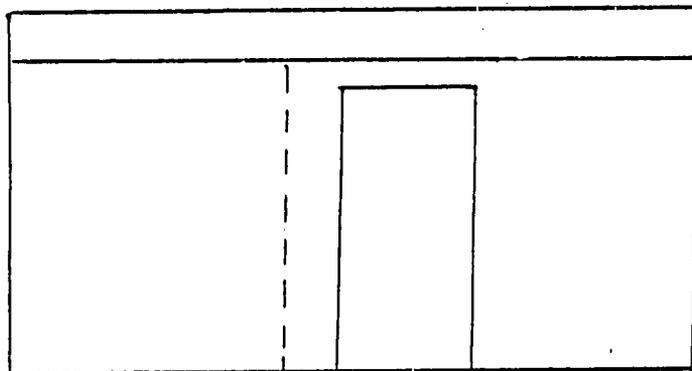
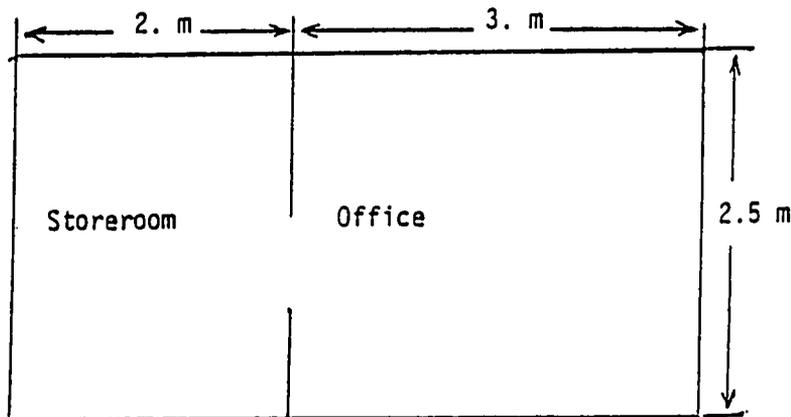
- 3,500 bricks à 25 sFr/brick	sFr 875.--	\$ 500.--
- 1 ton cement à 500 sFr/t	500.--	286.--
- 1 door with lock		
1 window, both corrugated steel	175.--	100.--
- occasional labour	550.--	314.--
	<hr/>	<hr/>

Total per building

sFr 2,100.-- \$ 1200.--

Standard Office/Storerroom Building

2 such buildings will be required, one in El Obeid nursery, one in Ghabsha nursery.



Costs per building:

- 3,500 bricks @ .25 sFr/brick
- 1 ton cement @ 500 sFr/t
- 1 door with lock
- 1 window, both corrugated steel
- occasional labour

sFr	875.--	\$	500.--
	500.--		286.--
	175.--		100.--
	550.--		314.--
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Total per building

sFr 2,100.-- \$ 1200.--

A n n e x 5 : Article from SAHAFA (Sudan newspaper)

SANITARY NATIONAL PAPER - ISSUE NO 9661
25/5/79

شروع تنظيم حزام الصمغ العربي لمديرية شمال كردفان

عبد الكريم ابراهيم

خلق مراكز انماء في المنطقة الشرقية والشمالية والوسطى بشمال كردفان كمرحلة اولى وتعتمد الخطة

اساسا على تجميع طاقات المزارعين والاستفادة منها في زراعة اشجار

للشباب في مزارعهم الخاصة وحمايتها وانتاجها والاستفادة من

بطلها فالمشروع في مراكز الانماء

يقوم بتوفير البذور والشتول والارشاد ويقوم المزارعون بعمليات

الزراعة والرعاية والانتاج وسوف تختصر مزارع الدولة في مساحات

ضيقة اما للارشاد او داخل الحزمة اللواقية حول المدن كما يهدف

المشروع ايضا الى الاستفادة من الطاقات الطلابية في خلق غايات

مدرسية وتعميق مفهوم التعليم الاخضر للاستفادة من خلقها في

تشجيع المدارس كذلك تتجه النية لتحريك طاقات الشباب والاستفادة

من منظمات الاتحاد الاشتراكي وروافده في تنظيم الجماهير وتحويل

ملاقاتهم الى عمل مشر . وسوف تساعد في تنفيذ هذا المشروع

وزارات التخطيط والزراعة بالاضافة للاتحاد العالمي للامومة والطفولة

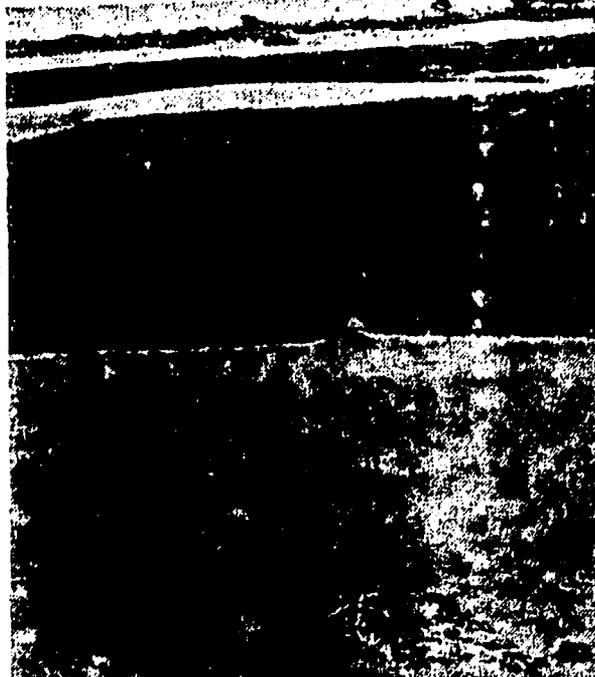
ومديرية شمال كردفان وسيشكل الاتحاد العالمي بمعظم التكليف خاصة فيما يتعلق بالماكنات والمعدات

والمواصلات ومصارييف للتشغيل وسيكون دور مديرية شمال كردفان

في توفير المكاتب والسكن والموظفين وبعض الالتزامات الاخرى التي في

جلتها لانتشغل عنه كبيرا حاليا وعموما يعتبر مشروع حزام الصمغ

العربي بداية عمل كبير لتنمية مديرية شمال كردفان العامرة بخيرات



يمثل للمشروع جزء من الحزام خضر الافريقي جنوب الصحراء المدة الزحف الصحراوي وهو زه من ثلاثة دراسات جديى تترك فيها السودان مع منظمة اينة والساحل وهي :-

(1) مشروع تطوير المراعى نثرة الحيوانية

(2) مشروع الحزام الاخضر فريقي لدول الساحل جنوب صحراء

(3) مشروع المياه الجوفية وقد مت هذه المشاريع في اجتماع

جلس الاستشارى لمكافحة الزحف صحراوي في اول اجتماع له في

وبى في مايو ١٩٧٨ والذي ضم ول المتائرة والمولين ومنظمة

سم المتحدة اما فيما يخص مشروع الصمغ فهو يهتف الى

اذا زراعة اشجار الشباب في غس المناطق التي تاثرت بالجفاف

زحف الصحراوي وقد شمل روع مديريات شمال كردفان

ار فور والنيل الابيض وتقام ستلون بقسم خدمات وتطوير

اج الصمغ العربي بالسودان ضه على منظمات الامم المتحدة

دول والمنظمات العالمية الاخرى ض الحصول على التمويل اللازم

ن بين هذه المنظمات ابدى اتحاد اية الامومة والطفولة العالمي

اسن للمساعدة في تمويل الجزء ي يخص شمال كردفان كمرحلة

ى وزار ممثل الاتحاد منطلقة ا وتمت مناقشة المشروع مع

جات المسؤلة في القطاع الزراعى ت الموافقة المبدئية على التعاون

السودان والاتحاد العالمي الامومة والطفولة على تنفيذ

الجزء الذى يخص مديرية شمال كردفان وعاد الممثلون الى جنيف لمناقشة رئاسة الاتحاد على الموافقة النهائية للدخول في المشروع وقام الوفد اخيرا ببحث ووضع الصيغة النهائية للمشروع واسس التعاون وحجم المعونة ودور الجهات المعنية المختلفة ويهدف المشروع الى اعادة زراعة مساحات واسعة من الاراضى المتدهورة باشجار الهشات داخل منطقة حزام الصمغ العربي وذلك لتحقيق الاتى :-

(1) تحسين الاراضى وتوفير دخول اضافية للمزارعين لتقليل الهجرة وربط المزارع بالارض على مدار العام وحماية التربة من الانجراف لتواصل العطاء للمحاصيل الزراعية الاخرى وتحسين زيادة انتاجها وتوفير العمالة في الريف وتحسين مستوى المعيشة وزيادة انتاج الصمغ العربي بشمال كردفان وبالتالي زيادة دخل للمزارعين والمديرية والدولة والبداية لايقاف الزحف الصحري سنا تهدف الخطة الى

الجزء الذى يخص مديرية شمال كردفان وعاد الممثلون الى جنيف لمناقشة رئاسة الاتحاد على الموافقة النهائية للدخول في المشروع وقام الوفد اخيرا ببحث ووضع الصيغة النهائية للمشروع واسس التعاون وحجم المعونة ودور الجهات المعنية المختلفة ويهدف المشروع الى اعادة زراعة مساحات واسعة من الاراضى المتدهورة باشجار الهشات داخل منطقة حزام الصمغ العربي وذلك لتحقيق الاتى :-

(1) تحسين الاراضى وتوفير

A n n e x . 7 : "RESTOCKING OF THE GUM BELT OF SUDAN",
report by Hag. M. Awouda

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RESTOCKING OF THE GUM BELT OF SUDAN

by H. M. Awouda

I. Background

Gum Arabic is a minor forest product of the genus Acacia (Acacia senegal). Its importance lies not only in the fact that it is used in a wide range of industries, but also because it is a peasant industry providing income to the farmer at a time when it is most needed. Because the tree is an arid zone species, it has even greater importance in the protection and improvement of soils, in providing fodder and indeed in facilitating further periods of agricultural cropping.

The Sudan produces about 70-80% of the world demand but lately the Sudan total gum production is falling at an alarming rate. A decrease of 47% in three years has been recorded. This is mainly because of drought and the many harmful practices in the area, over-exploitation, lack of coordination and negative competition for resources. Consequently, the gum belt $\frac{1}{2}$ of Sudan is threatened by the marching desert and, accordingly, supplies became unstable and unpredictable. Prices rose and industry was the victim being unable to plan on a reliable resource.

Because of the drought that has been experienced in the gum belt of Sudan during the last five years, the production has decreased tremendously from an average of 45,000 tons annually to only 22,000 tons and the value of stock lost is about \$20,000,000/year. The drought has affected gum production in three main ways:-

- Because of failure to grow agricultural crops in the Northern parts of the Gum Belt, people tended to leave the land to the Gezira area for cotton collection and therefore a sizeable portion of the gum belt was not being worked.

1/ GUM BELT:- It extends throughout the breadth of Africa south of the Sahara between 12 - 15°N covering Senegal, Mauritania, Mali, Nigeria, Chad, Sudan and others.

- Because of poor pastures, greater pressures were exerted on the natural flora and hence considerable destruction to the gum belt to provide fodder and other needs was experienced in many parts of the belt.
- Because of adverse environmental conditions and the successive seasons of drought growth was retarded, trees were weakened and hence extensive area of Acacia senegal trees were wind blown.

2. Justification

The deterioration within the gum belt of Sudan has caused severe ecological, social and economic imbalances. As a result of a survey carried by H.M. Awouba, it has been found that about 67% of the families surveyed in Northern Kordofan Province (the largest centre of production) do have gum plantations. Out of the 67% about half (33%) have their gum gardens either already degenerated or in the process of being degenerated. The survey has also revealed that the farmers incomes from agriculture are low below that of subsistence and about 25% of that income comes from gum Arabic production. Because of this deterioration and low incomes, people tended to leave the land and migrate to the Gezira area for cotton collection and also to the capital of the country seeking other jobs. The migration is increasing at an alarming rate, as is evident from the following table: (Table I)

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T A B L E I

Migration Rate to the Gezira Area

<u>Year</u>	<u>No. of labour migrating for cotton collection</u>	<u>% of Increase to base year 60/61</u>
1960/61	241,048	100
1964/65	431,699	180
1968/69	496,265	206
1972/73	542,000	226

* Source:- Labour Research Office,
Department of Labour, Khartoum.

Most of this labour did not come only from Kordofan and Darfur Provinces, but mainly from the productive labour within the gum belt. The trend in future is expected to continue and it is now apparent that many families have chosen to stay in the Gezira and in the capital of the country and have left the land altogether; people are now talking about the dying generation of gum precadures.

Because of the deterioration in soils, there is also a marked reduction in agricultural production per unit area in Northern Kordofan Province, as evident from Table 2:-

T A B L E 2

Production/Unit Area of Agricultural Crops
In Northern Kordofan Province

<u>Type of Production</u>	<u>Production per Faddan</u>		
	<u>1960/61 Tons.</u>	<u>1967/68 Tons.</u>	<u>1972/73 Tons.</u>
Sorghum	0,377	0,120	0,136
Millet	0,545	0,180	0,088
Groundnuts	0,400	0,248	0,09
Sesame	0,348	0,093	0,09

Source:- Derived by H.M. Awouda from Kordofan reports.

The Sudan is aware that gum Arabic is a national wealth and needs to be conserved and developed, not only to provide a sustained yield of gum, but also for the other important socio-economic benefits of protection and production.

The Sudan is also aware that the gum belt of Sudan is a natural buffer zone between the desert proper in the North and the agricultural tall grass savanna in the South. Therefore destruction or misuse in the zone will induce desert encroachment and consequently threatens agricultural production.

The region also supports an enormous population of animal wealth totalling up to about 20 million head of camels, cattle, sheep and goats.

All this explains the high priority given by the Sudan Government for the restocking of the gum belt and the improvement of gum production.

3. Objectives of the Project

3.1: Long-term Objectives.

- Halt desert encroachment by restocking the gum belt
- Increase gum production to keep pace with the world demand. ✓
- Ensure sustained yield and security of supplies.
- Contribute to the balance of payment.

3.2: Short-term Objectives.

- Restock vast pockets (more than 144,000 hect.) of deteriorated lands within the gum belt
- Improve pasture and provide fodder from trees thus releasing pressure from areas on their way to deterioration ✓
- Protect sandy soil from being blown off
- Reduce seasonal migration from rural areas to towns
- Provide employment and improve standard of living in rural areas.

4. WORK PLAN AND TIME TABLE OF ACTIVITIES

4.1 Work Plan

The project aims to establish 360,000 feddans (144,000 hect.) in six years with (Acacia senegal) trees to restock the gum belt of Sudan. The important point about restocking of the Gum Belt is that it brings in the direct involvement of the people because it is a peasant industry and the policy

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is to remain so. It is also part of the traditional landuse rotation and the local people are ready, willing and able to restock the belt by restocking their own private holdings. The strategy developed for the implementation of this project is a capitalization on the traditional system. By provision of seeds, seedlings and effective network of extension service the locals will execute the proposed programme in their private holdings. The government plantations will be reduced to minimum - only for demonstration purposes.

4.2 - Duration of the Project

7 years (1978 - 1984)

4.3 - Place and Phasing of the Project

The project covers three provinces; Northern Kordofan, Northern Darfur and White Nile provinces. It is hoped to establish six centres, covering the three provinces, for the provision of seeds, seedlings and extension service. Total annual planting is planned at the rate of 60,000 feddans (24,000 hect.), and distributed as shown in Table 3:-

T A B L E 3

Distribution of Area to be Planted by Provinces

Province	Annual Planting		T O T A L		No. of centres proposed
	fedd.	Hect.	fedd.	Hect.	
N. Kordofan	30,000	12,000	180,000	72,000	3
N. Darfur	20,000	8,000	120,000	48,000	2
White Nile	10,000	4,000	60,000	24,000	1
G. TOTAL	60,000	24,000	360,000	144,000	6

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4.4 - The criteria to be used for selection of sites for restocking of the gum belt is given in Table 4:

T A B L E 4

Check List of Selection of Sites

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Points to consider	1.	2	3
1 - Availability of gum trees.	Good	Medium.	Poor.
2 - Growth conditions.	Good	Medium	Poor.
3 - Distribution in the area.	Good	Medium.	Poor.
4 - Stocking per Unit/area.	Good.	Medium	Poor.
5 - Condition of pasture.	Good.	Medium.	Poor.
6 - Agricultural production.	Increasing.	Constant	decreasing.
7 - Migration of labour.	Negligible.	Moderate.	Considerable.
8 - Is soil protection needed.	No	Yes.	Yes.
Decision:	leave as it is.	enrich	restock.

There will certainly be many border-line situations as opposed to clear cut cases given in table No. 4, but each has to be treated on its own merits. The check list will also serve as a guide in identifying priorities.

4.5 - Time Table of Activities

Initially the project will have a duration of 7 years, from 1978 to 1984.. The first year will be a preparatory phase and the following six years will be actual execution of the work plan. The time table of project activities is as follows:-

6 Months - June 1978 to December 1978:

- a) Provision of machinery, equipment and transport facilities
- b) Execution of the building programme
October - June

- c) Establishment of nurseries
October - June
- d) Selection of sites for planting
- e) Recruitment part of the personnel
- f) Extension Specialist for drafting extension plan (4 mm)
(Expatriate) September to December
- g) Socio-economist (4mm) (Expatriate)
+ Ecologist (4 mm) (Local)
 - i. Evaluation of Socio-economic and ecological side before the project starts
 - ii. Evolution and introduction of a system of data collection on both aspects
- h) Opening of records
- i) Collection of seeds.
(October to April)

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Year (2) - 1979

- a) Stocking of nurseries
- b) Collection of seeds
- c) Recruitment of rest of personnel
- d) Execution of extension programme
- e) Selection of sites
- f) Execution of annual planting programme
- g) Completion of supply of machinery
- h) Recording and mapping
- i) Data collection and reporting
- j) Maintenance of machinery etc.

Year (3) 1980 to Year (6) 1983

As above in year (2).

Year (7) 1984

- a) As above in year (2)
- b) Socio-economist + Ecologist for final evaluation and assessment and writing of the final report (6 mm.)

5. INPUTS AND COSTS - BUDGET

The required inputs are mainly in the form of machinery, transport facilities, equipment, personnel and materials. A breakdown of these requirements and their estimated cost, together with an indication of sources of finance (whether local or foreign) is as follows:-

<u>Input</u>	<u>US DOLLARS</u>		
	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
a.) <u>Short-term Consultants</u>			
- Extension Specialist (4 mm) (at \$54,000 per ann.)	-	18,000	18,000
- Socio Economist (10 mm) (at \$54,000 per ann.)		45,000	45,000
- Ecologist (forester) Local salary	6,000	-	6,000
Total	6,000	63,000	69,000
b.) <u>Personnel (all local) (per ann over the 6 operational years)</u>			
- 1 Director of Project	7,000		7,000
- Asst. Director of Project.	5,000		5,000
- 3 Conservators of forests (4,500 x 3)	13,500		13,500
- 3 Forest officers (3,500 x 3)	10,500		10,500
- 10 Forest rangers (2,800 x 10)	28,000		28,000
- 15 Forest overseers (1,500 x 15)	22,500		22,500
- 2 Clerk class 1 (2,000 x 2)	4,000		4,000
- 4 Clerks (1,400 x 4)	5,600		5,600
- 4 Accountants (2,000 x 4)	8,000		8,000
- 20 Drivers group III (1,000 x 20)	20,000		20,000
- 20 Drivers group II (1,200 x 20)	24,000		24,000
- 5 Drivers group V (1,500 x 5)	7,500		7,500
- 15 Labourers group III (1,000 x 15)	15,000		15,000

<u>Input</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
- 30 Labourers group II (800 x 30)	24,000		24,000
- 60 Labourers group I (600 x 60)	36,000		36,000
- 2 Messengers (600 x 2)	1,500		1,500
Total	232,100		232,100
c) <u>Machinery & Equipment (Capital)</u>			
- 9 Tractors (at 14,000 x 9)	-	126,000	126,000
- 10 Water trailers (at 3,000 x 10)	30,000	-	30,000
- 15 Trailers (3,000 x 15)	45,000	-	45,000
- 10 Water Pumps (3,000 x 10)	-	30,000	30,000
- Camping Equipment	-	25,000	25,000
- Various local tools	20,000	-	20,000
Total	95,000	181,000	276,000
d) Travel and perdition/ann.	10,000	87,435	97,435
e) <u>Transport Facilities (Capital)</u>			
- 9 Lorry Trucks (150,000 x 9)	-	135,000	135,000
- 9 Water Tanker Trucks (15,000 x 9)	-	135,000	135,000
- 10 Landrovers P.U. (15,000 x 10)	-	150,000	150,000
- 1 Landrover Stationwagon (30,000 x 1)	-	30,000	30,000
- 1 Car Saloon	-	12,000	12,000
- 1 Mobile Cinema	-	30,000	30,000
Total	-	492,000	492,000
f) <u>Buildings (Capital)</u>			
- Houses, Offices and Stores	280,000	-	280,000
- Establishment and augmentation of nurseries (5,000 x 6)	30,000	-	30,000
Total	310,000	-	310,000

<u>Input</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
f) Establishment and Pumping cost (average per ann. for 5 operational years)			
- Seeds (annually)	70,000	-	70,000
- Nursery Material (fencing, polythene tubes etc.)	40,000	-	40,000
- Oils and Petrol	60,000	-	60,000
- Maintenance of cars (31 cars)	30,000	-	
- Spare parts for the machinery	-	15,000	15,000
- Office Furniture	15,000	-	15,000
- Stationary	6,000	-	6,000
- Water and Elect.	3,000	-	3,000
- Post & Teleg.	6,000	-	6,000
- Contingency	30,000	-	10,000
- Others:	10,000	10,000	20,000
<hr/>			
Total	270,000	25,000	305,000
<hr/>			
First operational year	170,000	-	170,000
g) Training & Research and data collection	65,000	105,000	170,000
h) Publication of Material	42,000	35,000	77,000
i) Surveys and Mapping	28,000	19,000	47,000

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T A B L E 5

Budget: Showing Foreign Component - 30% of Total

US \$

I T E M	1978	1979	1980	1981	1982	1983	1984	TOTAL
a) Short-term Consultants	-	45,000	-	-	-	-	18,000	63,000
b) Travel and per diem	-	87,435	87,435	87,435	87,435	87,435	87,435	524,610
c) Machinery and Equipment	181,000	-	-	-	-	-	-	181,000
d) Transport facilities	300,000	192,000	-	-	-	-	-	492,000
e) Buildings	-	-	-	-	-	-	-	-
f) Establishment and Running Cost	-	10,000	20,000	30,000	30,000	30,000	30,000	150,000
g) Training and Research	15,000	15,000	15,000	15,000	15,000	15,000	15,000	105,000
h) Publication	5,000	5,000	5,000	5,000	5,000	5,000	5,000	35,000
i) Surveys and Mapping	2,000	2,000	2,000	2,000	2,000	4,000	5,000	19,000
TOTAL	503,000	311,420	129,420	139,420	139,420	141,420	160,400	1569,610

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Table No. 6

Budget :- Showing local component :- 70% of total

IN U.S. \$

ITEM	1978	1979	1980	1981	1982	1983	1984	Total
a) Personnel	600	238000	232000	232000	232000	232000	232000	1398600
b) Travel & p.d.	-	10000	10000	10000	10000	10000	10000	60000
c) Machinery and Equipments	95000	-	-	-	-	-	-	95000
d) Transport facilities	-	-	-	-	-	-	-	-
e) Buildings & Establishment of Nurseries	200000	110000	-	-	-	-	-	310000
f) Establishment & running costs	-	170000	270000	270000	270000	270000	270000	1520000
g) Training, Research & data collection	15000	15000	15000	5000	5000	5000	5000	65000
h) Publication	6000	6000	6000	6000	6000	6000	6000	42000
i) Surveys & Maps	3000	3000	3000	3000	3000	5000	8000	28000
Total	319600	552,000	536,000	526,000	526,000	528,000	531,000	3518.6

6. Institutional Arrangements and Project Management

The proposed project will be executed by the Forest Administration of the Ministry of Agriculture, under the direct supervision of the Management and Services Division for Gum Arabic, the main task of which is to formulate, execute and follow up the development plans for gum Arabic as part of the General Land Use policy.

The Forest Administration is well equipped with technical personnel and the Sudan, being the largest producer of the commodity, has a world wide experience in gum Arabic establishment and production.

This proposed project is believed to be the baseline for the national green belt. It is also complementary to SOLAR project because the Acacia senegal tree is a fodder in itself and is known to improve pastures in the under story. There will also be a close coordination with SOLAR at the local level, since both transnational projects have one joint Technical Committee. Among the members of the Committee are the two Sudan representatives of the P.J.C. hence ensuring coordination at the regional level.

7. Cost/Benefit Analysis (Social)

7.1 - In Terms of Desert Encroachment Control:-

- The project will help to restock vast pockets of deteriorated
l a n d s within the gum belt caused by either drought
or misuse;
- It will render the gum belt as an effective buffer zone
between the desert l a n d s in the North and the
fertile agricultural lands in the South;

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- It will improve pastures and provide fodder from trees thus releasing pressure from many areas on their way to deterioration;
- From a protection point of view, and in its natural habitat it protects the sandy soil from being blown off, and hence check desert encroachment;
- It will reduce seasonal migration by making people stick to the land - working all the year round;
- It will improve microclimate and regain lost areas and render idle land productive.

7.2 - In Terms of Socio-Economic Improvement

The gum tree is definitely a gift of nature because it displays the following characteristics:

- From a biological point of view, it can regenerate naturally or artificially by seeds or seedlings or even by coppies. Consequently it can be established at a very low cost;
- It will improve the soil conditions and facilitate further periods of agricultural cropping;
- The tree is also a natural soil improver because it fixes nitrogen to the soil and also adds phosphorous and ammonium nitrates and organic matter thus contributing to the fertility of the soil;
- Consequently, it is safe to conclude that it helps to increase agricultural production either through protection of soil and crops or through improving and adding to its fertility;
- Like any other tree, it also contributes to the provision of forest products in rural areas, e.g. fuelwood, charcoal and building poles.

After all this, comes gum Arabic production to provide extra sustained income to the farmer and the state.

The protective role of the hashab tree is the most important role of all. The gum areas of the Sudan are mostly sandy, unstable and highly vulnerable to erosion. If there is no gum tree in such area the good agricultural top soil will be blown off and consequently a marked reduction in agricultural production will result. Therefore, it is possible to conclude that in such areas and in the long run, if there is no gum tree there would be no agriculture. Consequently, the opportunity cost of foregoing the gum trees in their natural habitat is very high, and to an extent the state cannot afford.

Therefore, from a social and economic point of view, gum Arabic does not only earn about \$45 million in hard currency but to this a similar figure should be added to cater for the agricultural production, and also about \$15 million estimated for forestry products. This is apart from the other unquantifiable benefits such as the amelioration of climate, amenity, improvement of pastures, etc..

7.3 - In Terms of World Trade

The expected production of gum Arabic will ensure security of supplies, sustained yield and income and stabilization of prices. These factors will give the gum Arabic industry in the western world the latitude to plan ahead on a reliable stable resource.

Production and incomes anticipated from the project are given in Tables 7 - 9.

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Table 7
Areas planted, production and income from gum arabic

YEAR	AREA PLANTED IN FEDDANS	YEAR OF PRODUCTION	PRODUCTION IN TONS	INCOME (\$ MILLION)
1978	-	-	-	-
1979	60,000	1984	2,000	2.5
1980	60,000	1985	4,000	5
1981	60,000	1986	6,000	7.5
1982	60,000	1987	8,000	10.
1983	60,000	1988	10,000	12.5
1984	60,000	1989	12,000	15

Export price = \$1200

The restocked area will continue on production up to year 2000 - realizing an annual income of \$17.5 million/ann. on today's prices.

Today's prices

Table 8
Cost/Benefit analysis: (Financial analysis)

Financial Cost Flow (US \$000)

Year	Total Cost	Total benefit	Incremental Benefit
1.	1888	-	-(1888)
2	957	-	-(957)
3	655	-	-(655)
4	655	-	-(655)
5	655	-	-(655)
6	655	-	+(655)
7	1685	2500	+(815)
8	2686	5000	+2,314.
9	3686	7500	+3,814
10	4686	10000	5,314
11	5686	12500	6,814
12	6686	15000	8,314
13 - 20	53488	120000	66,512

With the exception of the first six years the Project shows positive incremental benefit. When the cash flow is computed for financial analysis, the result is an internal rate of return of 45%.

In conclusion the project is socially, economically and ecologically feasible.

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Table No. 9

Gum Arabic Production and Income
from restocked lands (1978-1984)

YEAR	AREA PLANTED IN HECTARES	YEAR OF PRODUCTION	PRODUCTION IN TONS	INCOME (\$ MILLION)
1978	-	-	-	-
1979	24,000	1984	2,000	2.5
1980	24,000	1985	4,000	5.0
1981	24,000	1986	6,000	7.5
1982	24,000	1987	8,000	10.0
1983	24,000	1988	10,000	12.5
1984	24,000	1989	12,000	15.0

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Annex 11 : Photographs

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Baobab tree sometimes
used for water storage



Gum Arabic ready for picking



Typical poor savanna with village perimeter

AVIATION PHOTOGRAPHY

family compound
within village



within village area

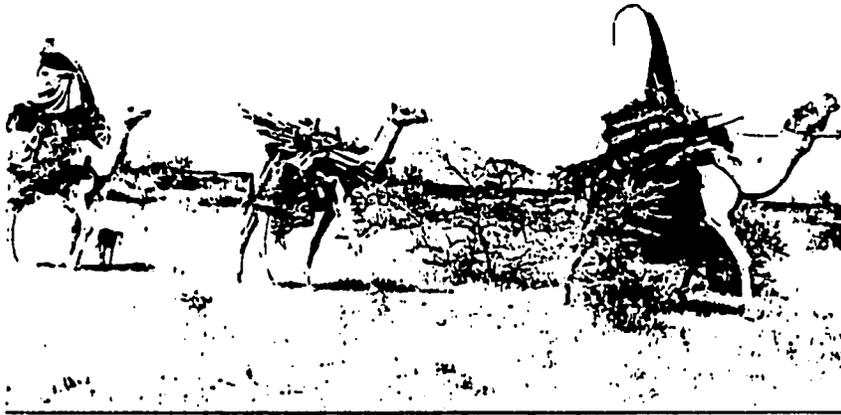


typical construction



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Shinabla Nomads
near El Obeid



Camels grazing on
Acacia Senegal
(typical private
gum plantation)



Camel driven
oil press for Sesame





rubber water bucket



shallow well, Um Beshiri



dried out haffir

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A n n e x 12 : Initial Environmental Examination

INITIAL ENVIRONMENTAL EXAMINATION

I Project Description

The project is basically a socio-economic program in a Sahel region taking into consideration the ecology of the area and the tradition of the people. Because of desertification, activities will revolve around reforestation of the Acacia Senegal tree (gum arabic) which has, for at least two centuries, been the economic base of the rural communities of the area.

Restocking of the Sudan Gum Belt will tend to offset adverse economic, social and ecological imbalances. It has been determined that almost 70% of the families in Northern Kordofan (the largest center of gum arabic production) do have gum plantations and traditionally are familiar and partially dependent upon this crop. Approximately one-half (35%) of these families have gum arabic areas already degenerated or in the process of degeneration. Because of this situation resulting in desertification and generally low and irregular income, the population tends to leave the land, migrating to large agricultural schemes and to cities seeking other jobs.

In the project area itself, seedlings will be grown in four renovated nurseries forming a rough triangle between Bara, El Obeid and Um Ruaba covering an approximate area (including dispersion) of 5,000 square kilometers supporting a population of about 500,000 (including nomads). The project headquarters and staff will be located in the Um Ruaba area, with Government staff (seconded to the project) in Bara, Um Ruaba and El Obeid. Very little construction is necessary as most buildings already exist in the nursery areas. Construction will be mainly limited to lodgings of traditional design using local materials as well as the seed beds within the nursery areas. All nurseries already have independent water supplies.

II. Area and Climate

The topography is generally flat and is described as poor savanna with many areas in a state of desert or in the process of desertification. Daily temperatures vary between 18° - 40° C with sparse rainfall averaging 200 to 500mm per year, mainly between mid June to September.

III Water

Lack of water is a serious problem in this Sahel area. Sources are generally from shallow wells, bore holes (lesser extent) and hafirs. Many villages must rely completely on water merchants during the dry season for their basic daily supply.

IV Population

The people of the project area are mainly of the Jawama tribe whose livelihood depends upon subsistence farming (mainly gum arabic, groundnuts, millet and sesame). The average family may have eight members, with each family holding approximately 15 feddans (about 15 acres).

V Wildlife

Other than birds, desert fox, small wild cats and rodents, practically all wildlife has been destroyed by the local population either through hunting, grass fires or general misuse of the land.

VI Discussion of Impacts

A. Land Use

1. Changing the character of the land through:

- a) Increasing of human population - The reclamation of degraded land does not necessarily mean that the local population will increase as availability of water supply would provide a limiting factor.
- b) Changing soil character - The soils are being abused at an accelerating rate. One of the major objectives of the project is to reverse this process through re-establishing and reinforcing traditional methods used by the farmers which include intercropping and the maintenance of Acacia Senegal on their holdings.
- c) Extracting natural resources - No known natural resources are in the project area. Roads are sand track not requiring fill material.
- d) Land clearing - Contrary to land clearance, one of the objectives of the project is to re-establish vegetation. No mechanization is envisaged.
- e) Construction - There will be a minimum of construction as the

project will ^{use} existing structures. Construction will be limited to building traditional huts (mud thatch) and seed beds in the existing nurseries.

2. Altered natural defences: One of the major objectives of the project is to re-establish an ecological equilibrium in the disturbed areas.
3. Foreclosing important and perhaps better uses of land: To the contrary, land areas now subject to degradation will be opened up to the rotational cultivation cycle.
4. Jeopardizing man or his works because either is put into a zone of potential disaster: The project has no foreseeable effect in this respect.
5. Other factors:
 - a) Livestock - This project should have no impact on the amount or quality of livestock in the area.
 - b) Mechanization - No machinery will be introduced into the project area other than mechanized transport. As the project progresses, vehicles will be phased out and replaced with traditionally used work animals.
 - c) Agricultural practices - No new vegetation or animals are introduced, and emphasis will only be placed on reviving and reinforcing a crop rotation system which has been used for at least two centuries.
 - d) Roads - No road construction is necessary in connection with the project.
 - e) Water quality - The project will have little or no negative impact on the quantity or quality of the water supply in the area.
 - f) Atmosphere/noise pollution - No additives will be added to the atmosphere and no additional noise will be introduced in the project area.
 - g) Natural resources - The only use of natural resources would be water at the nursery sites. Since these water sources are independent from the water used by the local population and since the amount would be minimal, no impact is foreseen on the total amount of water available in the project area.

- h) Cultural - Since the project is specifically designed to revive and reinforce traditional methods already used for the last two centuries, no impact is foreseen on the cultural aspect of the region.
- i) Socioeconomic -
1. Changes in patterns of economic growth and employment - It is hoped that the project will create an area of increasing productivity and income in the selected villages. All farmers in target villages will have the opportunity to participate. Only a certain section of the overall project area has been selected, however, due to the limitations of cost and the need to carefully monitor and control interventions of a pilot nature. Economic growth and employment in the area will be accelerated, but not to a disruptive degree.
 2. Movement, resettlement or change in population - The proposed project will affect some 2,000 farm families in the designated village areas. There may be some in-migration to benefiting villages, and a small number of nomads may decide to settle, however, overall impact on area population will be minor.
 3. Changes in cultural patterns -
 - a. Status of women - The reforestation activities are not expected to have an impact on the status of women other than through the natural side-effects of increased family earnings.
 - b. Authority sources - No disruption of traditional authority patterns are expected from the reforestation activities, however, it is possible that in conjunction with the planned cooperatives, the traditional enforced role of the merchant might be diminished. By encouraging the traditional authority figures to participate in the project, impacts may be mitigated and benefits should accrue to the parties as a result of the utilization of experienced leaders, commercial and political figures.
 4. Education - The project will stress extension training in farm practices as well as the participation by the farmers. Training will be based on the assumption that the village participants are illiterate. Efforts will be made to

encourage attendance at the primary schools (and secondary schools) and to stress the learning of practices which will aid the child to cope with day to day living within his context.

5. Health

- a. Altering or destroying a natural environment - No natural environment will be destroyed by this project.
- b. Eliminating an ecosystem element - No ecosystem element will be destroyed by the project.
- c. New pathways for disease vectors - There is no risk to introduce animal, plant or human disease vectors by the project.
- d. Human - The human condition is not affected by the project in an adverse way, to the contrary.

j) General

- a. International impacts - The project has no international impact.
- b. Controversial impacts - That certain village clusters will initially receive special attention and other will not may bring about a certain amount of controversy. This potential problem will have to be handled through careful planned extension work and information campaigns.
- c. Larger program impacts - The project is designed to develop a model system approach for replication in other Sahel areas.
- d. Aesthetics - The general appearance of the region will not be altered other than some areas which were previously desert may become useful farm land according to traditional patterns.

RECOMMENDATION FOR ENVIRONMENTAL ACTION

On the basis of the information supplied, it is clearly indicated that the project will not have a significant effect on the environment. It is hereby recommended that a "negative determination" be made.

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ATTACHMENT

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Sub-areas	Impact Identification and Evaluation <u>1</u>
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the human population _____	L
b. Extracting natural resources _____	N
c. Land clearing _____	N
d. Changing soil character _____	L
2. Altering natural defenses _____	L
3. Foreclosing important uses _____	N
4. Jeopardizing man or his works _____	N
5. Other factors:	
a. <u>Livestock</u> _____	L
b. <u>Mechanization</u> _____	L
c. <u>Agriculture</u> _____	M
d. <u>Roads</u> _____	L
B. WATER QUALITY	
1. Physical state of water _____	L
2. Chemical and biological states _____	N
3. Ecological balance _____	L
4. Other factors	

1 Use the following symbols: N - No environmental impact
 L - Little environmental impact
 M - Moderate environmental impact
 H - High environmental impact
 U - Unknown environmental impact

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IMPACT IDENTIFICATION AND EVALUATION FORM

C. ATMOSPHERIC

- 1. Air additives _____ N _____
- 2. Air pollution _____ N _____
- 3. Noise pollution _____ N _____
- 4. Other factors _____
- _____
- _____

D. NATURAL RESOURCES

- 1. Diversion, altered use of water _____ L _____
- 2. Irreversible, inefficient commitments _____ N _____
- 3. Other factors _____
- Wildlife _____ N _____

E. CULTURAL

- 1. Altering physical symbols _____ N _____
- 2. Dilution of cultural traditions _____ L _____
- 3. Other factors _____

F. SOCIOECONOMIC

- 1. Changes in economic employment patterns _____ M _____
- 2. Changes in population _____ L _____
- 3. Changes in cultural patterns _____ N _____
 - a. Status of women _____
 - b. Authority sources _____ L _____
- 4. Other factors _____
- Education _____ L _____
- _____

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IMPACT IDENTIFICATION AND EVALUATION FORM

G. HEALTH

- | | |
|---|---|
| 1. Changing a natural environment _____ | N |
| 2. Eliminating an ecosystem element _____ | N |
| 3. New pathways for disease vectors _____ | N |
| 4. Human _____ | N |

H. GENERAL

- | | |
|---------------------------------|---|
| 1. International impacts _____ | N |
| 2. Controversial impacts _____ | N |
| 3. Larger program impacts _____ | N |
| 4. Other factors | |

I. OTHER POSSIBLE IMPACTS (not listed above)

- | | |
|---------------------|-------|
| 1. Aesthetics _____ | _____ |
| _____ | _____ |
| _____ | _____ |

INITIAL ENVIRONMENTAL EXAMINATION

Project Location: Sudan
Project Title: Rural Gum Arabic Reforestation
Funding: \$497,140
Life of Project: Two years
IEE Prepared By: PVO staff (IUCW)
Date: January 22, 1980
Environmental Action Recommended: Negative Determination
Concurrence: REDSO/EA per Nairobi 5250
Date: March 18, 1980
Executive Decision by Mission Director

Approved _____

Disapproved _____

Date _____