

National Council for Research  
Energy Research Council

# **SUDAN RENEWABLE ENERGY PROJECT**

**Second Annual Work Plan**

**July 1984 – June 1985**



SUDAN RENEWABLE ENERGY PROJECT

SECOND ANNUAL WORK PLAN

JUNE 1984 - MAY 1985.

IMPLEMENTED BY:

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7/2/84

SPONSORED BY:

U. S. AGENCY FOR INTERNATIONAL DEVELOPMENT  
KHARTOUM/SUDAN.

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## 1- INTRODUCTION

With the completion of the first implementation year in June, 1984, the SREP will be somewhat over one year and a half old. In this report we intend to briefly present the project achievements during this period.

While the first year implementation began in June 1983, most of the work has been performed in the last 6 months. We now consider the project to be moving successfully towards its goals and substantial results have been achieved, within the priority areas of SREP in field testing, dissemination, and outreach. Overseas and local technical assistance has helped in formulating and implementing the projects. The establishment of the Technology Implementation and Dissemination Unit within the RERI has proved its importance. The RERI staff has also gained experience in the administration of grants.

Based on one year of implementation certain revisions have been proposed. They are being discussed with both USAID and GOS. Generally both USAID/GOS have assured us that there will be no fund. limitations for successful and cost effective projects under SREP.

The annual work plan for the FY 84-85 was prepared in accordance to experience and achievements presented in this report.

## II- Report on First Years Implementation

June 1983 - June 1984

### A. Institutional Development:

The focus of work in this area remains the development of Sudanese counterpart personnel within the RERI and other related institutions to undertake the field testing and dissemination of renewable energy technologies.

#### 1. Organizational Structure:

SREP was designed to focus on the development of outreach, extension, and dissemination activities within the Renewable Energy Research Institute (RERI). This focus is maintained through the designation of the Director of the Energy Research Council (ERC) as the Coordinator for SREP and the German Special Energy Programme (SEP). The Coordinator's role has been detailed to the Government of Sudan and USAID in a letter of November, 1983 (Appendix A.)

The Coordinator serves as the counterpart to the Chief of Party from Georgia Institute of Technology (GIT). They, in turn, report to the ERC Board (through its 6 member Technical Committee) which oversees the general direction and emphasis of SREP and SEP.

The Coordinator has designated assistants to help him in the management of the project.

The majority of the manpower to implement the SREP comes from RERI. Other staff have been seconded from other government institutions and hired on personal service contracts.

Also, the ERC cooperates with government organizations, private voluntary organizations, and private enterprises, which are involved in renewable energy activities in the Sudan.

As an example, the SREP has developed a strong working relationship with the Forest Administration, particularly in the fuelwood and charcoal production areas. Three foresters have been seconded to the Seleit shelterbelt project. The FAO sponsored fuelwood project within the Forest Administration is cooperating with SREP in a joint study of conversion factors in charcoal production.

Renewable Energy Development Grants (REDG) under the SREP are used to help many of these groups to develop their capacity to field test, commercialize and disseminate renewable energy technologies. Institutional Development and training, and physical plant development within the RERI are covered by the Contractor and GOS project account funds.

SREP also has advanced £ 400,000 to the SEP to support the construction of RERI building at Soba.

## 2. RERI Manpower Needs:

A two-man study team came to Sudan in August 1983 to analyze the manpower needs for renewable energy technologies development, field testing, and dissemination. The team focused on the present and projected manpower requirements of the RERI. A draft report was submitted in November for discussion by the Institutional Development Committee. The report was further discussed with the new Chief of Party in January, 1984. The revised Manpower Assessment was presented in March 1984.

The major recommendations of the study were the creation of the Technology Implementation and Dissemination Unit, and increasing technical capability in the biomass area. These were accepted and are being implemented.

Another recommendation now being implemented is the development of a short term training plan for RERI and related staff.

## 3. Participant Training:

Training under SREP is composed of 3 components:

- Long term training
- Short term training (USA & 3rd Country).
- Local Training

Dr. Bill Gross of the University of New Mexico visited Sudan in July, 1983 to assist in the development of long term training under SREP. During his visit it was decided that the most beneficial approach for this training would be an M.Sc. program in Renewable Energy Technologies administered jointly by the University of Khartoum, and the University of New Mexico. A program plan was organized and presented to the U. of K. and USAID, and acceptance from the latter (See Project Implementation letter No. 9, on 7 December, 1983).

Eight students began the M.Sc. course at the U. of K. in January, 1984, with a further eight expected to begin in January, 1985.

The following persons have received short term training under the SREP:

NAME	INSTITUTIONS	COUNTRY	NATURE
1. Dr. El Tayeb Idris Eisa	RERI	USA	Renewable Energy Tour in USA
2. Dr. Hassan O. Abd El Nour	ERC	USA	Biomass Productions.
3. Dr. El Sheik El Magzoub	U. of K.	USA	Renewable Energy Course.
4. Abdel Rahman Ahmed Gebril	RERI	Egypt	Solar Equipment Maintenance
5. Shadia Nasr Eldin	RERI	Kenya	Stoves Dissemination Seminar
6. Shomo Shaa Eldin	RERI	Kenya	" "
7. Dr. Ahmed Ibrahim Elhag.	U. of K.	Swazi-land	Minihydro
8. Ibrahim El Zein	RERI	"	"

Local training was mainly directed toward students from the University of Khartoum Faculty of Engineering and Architecture and the Khartoum Polytechnic Colleges. In May, 1983, 33 students from the Faculty of Engineering and Architecture attended a one month training program covering the different aspects of renewable energies application. The results of that course were so encouraging, that SREP offered a similar program in May, 1984 for the Polytechnic Colleges students.

## **B. Technology Development and Dissemination:**

Work in this field was limited to the five technology priority areas, identified in the previous implementation plan as:-

- Fuelwood production
- Charcoal stoves
- Charcoal production
- Wood stoves
- Small photovoltaic systems

As was agreed in the original implementation plan and in subsequent discussions between the Technical Committee, the Contractor, and USAID, technology development within the RERI is to be supported by contract and Project Account Funds, with development and dissemination activities carried on by institutions outside RERI supported by grant funds.

The general technology development and dissemination process outlined in the original implementation plan has been superceded by more detailed plans compiled for each of the five selected technologies. A formal grant selection/disbursement/monitoring system was approved by the Technical Committee and USAID and is now in operation.

Most development and dissemination work to date has centered around the Khartoum Province with limited activities in the Gezira, Blue Nile, and Northern Kordofan areas. We summarize briefly the achievements in these areas:

### **1. Fuelwood Production:**

This has been the most active area of SREP work to date.

Work has concentrated in irrigated agroforestry and the rehabilitation of existing nurseries in the Khartoum area. Table (1) lists the individuals and institutions that have received grants in this field. Small efforts have been made on rainfed afforestation and forest resource management (village forestry) with limited funding to serve as a test. Foreign and local experts have been used to organize and initiate individual projects.

To date fuelwood production activities have been limited to within the Khartoum area. However, surveys and feasibility studies were conducted to show the possibilities of future fuelwood activities in other areas.

Following is a brief description of fuelwood activities this past year:

**a. Seleit Agricultural Scheme:**

- Nursery established with 14000 seedlings planted.
- Agreement made with the scheme authorities for land preparation and water supply.
- Shelterbelts started at two sites.
- Preliminary working plan prepared in cooperation with the scheme authorities. This plan is mainly for the establishment of woodlots (850 feddans) new shelterbelts, shade and amenity plantings.

**b. Khartoum Nursery:**

Khartoum Nursery rehabilitation and expansion is progressing, but not to the degree expected, due to administrative and materials problems.

40,000 seedlings are now ready for planting. Most of the start-up problems have been solved and the nursery will come close to its full capacity of 300,000 seedlings by July, 1984.

**c. Soba Nursery:**

The work at Soba nursery project has been delayed because of pump design problems. Two new six-inch pumps are being installed and the nursery will be productive at expanded levels by July, 1984.

**d. Um Andaraba Village Forestry:**

This is the only rainfed forestry project sponsored by SREP. Limited funding was allocated for this project, due to the specifics of the site and the limitations of village manpower. This project will serve as an example of village self-help and, if successful, will be replicable by the many other communities with similar problems. The enthusiasm manifested by the villagers hopefully will insure the success of the project.

**e. Agroforestry:**

In the agroforestry area grants for 9 small farms have been approved and land preparation has begun. Some farmers have water supply problems (water not available in the Gezira Canal). Planting on most farms should commence with the onset of the seasonal rains.

New grant requests from farmers in the Gezira area are now being considered.

**2. Charcoal Stoves:**

This project area received considerable attention in the past year, with work concentrated on the field testing and dissemination of the stove design developed at the Faculty of Engineering and Architecture (U. of K.)

The results are two improved charcoal stove designs, which were disseminated through a contest for local manufacturers. Eighteen artisans responded to the contest with 28 versions of the stoves. Criteria for selecting the 3 winners were (1) price of the stove, (2) efficiency, and (3) durability. The contest winners were awarded purchase orders for 1000 stoves (from Grants). The 1000 stoves produced by the winners, will be used in to develop sales and distribution networks.

**3. Charcoal Production:**

Work in this field was originally divided into 4 tasks:-  
(1) management and socioeconomic studies, (2) evaluation of actual production practices in the Blue Nile, (3) testing and

dissemination of improved methods of production, and (4) marketing and policy use study. This work was undertaken in close cooperation with the Forest Administration and the FAO Fuelwood Project.

The evaluation of the charcoal production practices in the Blue Nile Province is almost completed. The reports prepared by the initial consultancies which surveyed charcoal production in the Blue Nile Province identified initiatives which may improve efficiencies in the systems.

A followup consultancy to quantify charcoal production conversion factors is now underway. This work will help in the development of SREP technology development activities and in the formulation of national policy in this field..

SREP has also supported the field testing of an existing metal kiln at SOBA for the purposes of training in the comparison and analysis of charcoal produced from different Sudanese wood species.

A study on charcoal marketing and policy has been undertaken and its report should provide important data relevant to technology development policy and planning in this field.

#### **4. Woodstoves:**

Progress in this area has been slow. The work has concentrated on data collection and laboratory testing of Sudanese traditional wood stoves. In addition some stove samples from abroad have been collected. The results of this work will be the design of new stoves suitable for application in Sudan.

#### **5. Photovoltaics:**

This area has been assigned the lowest priority for development. Small field testing/demonstration projects have been initiated by REDGs. Grant funds will be used to purchase and field test PV systems in rural areas. Systems financed under grants are:-

1. Self contained lanterns and PV panels.

2. Centralized charging station to recharge portable lanterns.
3. Solar refrigeration.
4. Street lighting for rural communities.

Also a PV electrical fencing system was tested at SOBA (FRC). Results were not encouraging but further testing will be undertaken at the Seleit Projects.

A study of the potential demand for PV irrigation systems has been initiated. This study will determine the feasibility of SREP grant supported activities in this field.

## 6. Dissemination:

The Technology Implementation and Dissemination Department of the RERI has now assumed full responsibility in this area.

The Department was formally established in January, 1984 with the appointment of the Director. His appointment has accelerated its activities.

Work in this area is proceeding very well as witnessed by the following achievements:

- Preparation of the charcoal stove contest, and work on stove commercialization.
- Demonstration of renewable energy technologies at the Khartoum International Fair, January, 1984.
- Preparation of TV Shows.
- Preparation of the "Technology Guidelines" manuals and leaflets.
- Publication of SREP consultants reports.
- Followup results of grants projects to develop case studies.

Data collection for potential applications of photovoltaic systems.

**7. Staffing:**

The SREP contract staff (the Chief of Party/Extension Specialist and Energy Economist), the short term foreign technical assistants, and their Sudanese counterparts (ERC and RERI) and other institutions, have worked well together in the past implementation year. This is witnessed by the project achievements. This approach will continue for the life of the project.

Overseas technical assistance in the first year has been the following:-

- Art Thivierge (Project Planning)	0.5 pm
- Bill Gross (Participant Training)	0.5 pm
- Anis Aclimandos & Jim Lehman (manpower)	2.0 pm
- Lester Bradford (Forestry)	4.0 pm
- Derek Earl (Charcoal Production)	2.0 pm
- Maxwell Kinyanjui (Charcoal Stoves)	1.0 pm
- Carolyn Huskey (Dissemination)	3.0 pm
	<hr/>
	13.0

**C. Local Staffing Consultancies:**

Five new RERI staff have been hired for the Technology Implementation and Dissemination Department (including its head).

In addition to these, other RERI personnel are providing the overall leadership for three of the five projects and helping in the execution and administration of the project. RERI has also appointed an information officer to work with the dissemination consultant.

Staff seconded from NEA and Military Research Branch have

been assigned to the woodstove and photovoltaic project respectively.

The following local long and short term consultancies were conducted:

- a. Consultant for 12 pm as project leader for fuelwood projects.
- b. Three person consultancy for 20 days to prepare study on "prospects of shelterbelts & agroforestry in the Northern Region".
- c. Consultancy for 1 pm to determine calorific values of certain species of wood & testing a metal kiln.
- d. Consultancy for 2 pm to determine the conversion factors in charcoal production in the Blue Nile Province.
- e. Consultancy for 2 pm to study the possibility of a village forestry project at Um Anderaba.

In addition, a number of foresters from the Central and Regional Offices of the Forest Administration are working in the grant forestry projects.

Besides the above mentioned technical staff, the following staff were appointed jointly by ERC and SREP.

- Office manager
- 2 Secretaries full-time
- Messenger
- 2 Accountants
- 3 drivers

**D. Procurement:**

In June, 1983, SREP/ERC administrative staff underwent an initial procurement training course, covering all three categories of the procurement process.

- Materials, equipment, supplies, and services for renewable energy technologies.
- Training aids, data analysis equipment, supplies and office equipment; and
- Renewable Energy Technology Library.

Actual procurement was delayed until more detailed work programs were developed for the five SREP technologies. On November 7, 1983, a meeting of USAID the GOS, and the Contractor formulated guidelines for on and off shore procurement. These stated that all items to be procured should meet one or both of the following criteria:

- 1) Serve the development and dissemination of the five priority technologies; and
- 2) Be put into use immediately upon arrival in Sudan.

In addition, proper facilities for the operation maintenance and storage of the procured item should be available before its arrival in Sudan.

Since this meeting, work on both local and off-shore procurement has progressed substantially.

**1. Materials, Equipment, and Supplies:**

Consultations with the project leaders for the five technologies produced an initial procurement plan for this area in March, 1984. Work on facilitating this procurement involved the contractor and the ERC/SREP administrative staff. The latter received further on-the-job training during this process.

**2. Training Aids, Etc:**

Initial procurement plans were made for this area in January-February 1984. The dissemination consultancy of March-June 1984 will augment these plans and produce a more extensive list of procurement needs to support dissemination of the five SREP technologies.

**3. Library:**

Procurement in this area was delayed due to the absence of library facilities and a librarian. The dissemination consultancy (and a library consultancy) will produce a procurement plan to cover the life of project needs for information retrieval and exchange.

**4. Procurement under Renewable Energy Development Grants:**

This procurement is the responsibility of the grantee, who is furnished a set of standard provisions regarding AID regulations covering this area. SREP assists the grantee when necessary in the procurement process, but such assistance to date has been minimal.

**E. Budget:**

SREP is financed by several sources of funding:

1. The contract budget (in US dollars)
2. The Renewable Energy Development Grant Funds, which has dollars and Sudanese pounds components.
3. The Trust Fund (in Sudanese pounds)
4. Project Account Funds provided from the Ministry of Finance and Economic Planning.
5. Government of Sudan contribution in-kind.

The dollar component of the budget and the trust fund are under the control of the contractor, while the Project Account Fund is under the control of the counterpart, but generally both contractor and counterpart are involved in the

process of disbursing the two budget components.

Based on project experience, some modifications to both funding sources (Sudanese Pounds and U.S Dollars) have been suggested and discussed with both USAID and Ministry of Finance and Planning.

**1. Dollar Budget:**

Table (2) shows the balance of the U.S. dollar budget. Cumulative expenditure as of 31 March 1984 was \$ 757,996.

**2. Renewable Energy Development Grants:**

It is clear from table (1) that U.S. dollars expenditure under the REDG program is minimal. This has resulted from the fact that most expenditures for the development and dissemination of the technologies have required local currency. This trend is likely to continue.

**3. Trust Fund:**

The previous implementation plan indicated the need to revise this budget to reflect changes in contractor support costs due to exchange rate adjustments and other factors. In February, 1984, USAID and the Government of Sudan approved the revised budget. The table below shows the details of this:

**Details of Local Currency Trust Fund**

Item	Original Amount	Revised Amount
Office Support	£ 32000	£ 130000
Local travel	£ 154000	£ 80000
Housing	£ 180000	£ 325000
Communications	-	£ 90000
Miscellaneous	-	£ 45000
T O T A L	366000	670000

Cumulative expenditure as of 31 March, 1984 was £ 200,000

#### 4. Project Account:

The Project Account Funds are intended to support field test support, local training expenses, fuel and lubricants, local field test equipments, local construction costs, and local REDG costs. Table 3 shows the money allocated up to June 1984 and expenditure March 31, 1984.

Table(1) shows in detail commitment and disbursement for REDGs through June 1984.

Experience with disbursement Project Account Funds showed that some revisions were advisable. The revised budget, as shown in Table (4), was discussed with the Ministry of Finance and Economic Planning in February 1984 and was presented for USAID/GOS approval. The revised budget contained increased grant and field test support funding to reflect higher implementation targets. The budget also included new funds for an incentive system for employees working under SREP.

#### F. Reports/Publications:

##### 1. Reports:

Progress reports on SREP activities have been made as follows:

- Monthly progress reports from the contractor to USAID.
- Semi-annual reports from the Counterpart to the Ministry of Finance and Economic Planning (two reports have been submitted to date).
- Regular reporting by project leaders to the Technical Committee is also practiced.

In addition to the above, both local and foreign consultants report monthly to the SREP on their particular activities.

##### 2. Publications:

In the last year SREP sponsored many consultancies. The output of these consultancies were reports published by SREP. By June, 1984 the following publications will be available from SREP.

a. Technology Guidelines:

- |       |                           |
|-------|---------------------------|
| No. 1 | How to Use Canun A Duga   |
| No. 2 | How to Plant Seedlings    |
| No. 3 | How to Plant Shelterbelts |
| No. 4 | What are Solar Cells.     |

b. Renewable Energy Reports:

- |     |   |
|-----|---|
| 001 | Abdel A. Bayoumi et al.<br>Study for the Establishment of<br>Forestry Plantations, Shelterbelts &<br>Canals, Northern Region. |
| 002 | Derek Earl<br>Charcoal Production in Sudan.   |
| 003 | M.O. Sammani et al.<br>Village Biomass Needs Northern<br>Kordofan Region.   |
| 004 | Maxwell Kinyangui<br>Report on Charcoal Stoves.   |
| 005 | Dr. Hassan Osman<br>Report on Conversion Factors for<br>Charcoal Production.  |

c. Promotional Materials:

- ERC/SREP promotion pamphlets, such as description of SREP, 2nd Year Work Plan, and Long Term Training Program.

### III- SECOND YEAR WORK PLAN (July 1984 - June 1985)

#### A. INSTITUTIONAL DEVELOPMENT

Many Government of Sudan organizations, private voluntary organizations, and private enterprises are involved in renewable energy activities in Sudan. The SREP grants are used to help as many of these groups as possible to develop their capacity to work in SREP technology priority areas. Contractor and GOS Project Account funds (other than for grants) concentrate on the development of the institutional capacity of the RERI in these areas.

The RERI staff, involved in the implementation of SREP are generally new to most of the five priority areas and some of them are new graduates with very little practical experience. Therefore plans for their training (by working with local and foreign consultants) and short term overseas training (Appendix B) are set to ensure their effective involvement in the SREP activities.

To meet the manpower needs of the project activities in the second year as presented in Appendix C, more use of long and short-term local consultancies will be needed. This can be met by either secondment of experienced personnel from other relevant institutions to work with RERI staff or assigning them on personal service contract basis, both for central and regional activities. Local staff will also be needed to work with the six Peace Corps Volunteers.

As the project activities in the coming year envisage covering a wider geographical area, more studies will be needed to formulate projects and proposals, (e.g fuelwood production in mechanized farming schemes in the Blue Nile Province, charcoal production and fuelwood combustion).

The SREP will continue to seek institutional support for its activities through the Renewable Energy Development Grants.

Institutions and organizations which have indicated interest in future participation are:

- National Energy Administration in dissemination and outreach and extension activities.
- Forest Administration District offices, Blue Nile Province, in field testing new designs for charcoal

kilns and briquetting machines.

- CARE and Foster Parents Plan/Sudan - in dissemination of charcoal and wood stoves.
- Faculty of Engineering, U. of K.
- Forestry Research Centre and individual nurseries.

1. **On the Job Training:**

All local and foreign experts will be used to the maximum extent possible in this area. Till now this has been limited to the project administration and management areas and other two individual projects (Seleit Project and Charcoal Stove Testing).

In the coming year RERI staff as well as staff from other institutions will work directly with both local and foreign consultants in those areas which are of high priority, and where the involved institutions has limited experience. To ensure this, more long term consultancies are planned, and one or more counterpart personnel will work with each overseas consultant .

2. **Participant Training:**

As reported earlier the Renewable Energy Technologies Graduate Training Program has started in the University of Khartoum. This is a two year M.Sc. Program in which eight students are enrolled.

It is expected that a second cycle will begin in January, 1985 if enough funds are made available (see section of budget).

Long term training will accomodate a wider range of renewable energy technologies than the 5 technology focus of SREP, as this training should accomodate the broader manpower needs for the RERI that extend beyond the project lifetime. However, short-term US and third country training will focus exclusively on the SREP and on technology dissemination techniques. A short-term training priority technologies plan for the period March, 1984, to January, 1986, prepared in consultation with the project leaders, is included

(Appendix B). The Contractor will be responsible for identifying potential institutions and locations for this training.

**3. Overseas Technical Assistance:**

After one year of implementation, the Sudan Renewable Energy Project has more clearly defined both its project approach and program emphasis. The approach is the promotion of renewable energy technologies through dissemination and extension activities and the emphasis is on biomass energy resources. In contrast, the RERI staff experience has been mainly oriented towards research, and towards solar energy resources. Because of this, more long term advisors should be provided than was originally called for in the project paper, in order to train and assist the RERI staff in implementing renewable energy activities in these new areas.

Originally short term assistance for 32 person months was included in the project. Out of this 13.00 pm of consultancy will be used in the first implementation year. During the second year implementation period (July 1984 to June 1985) the following consultancies are planned.

- Charcoal Stoves	3 pm
- RET Information Centre/Library	2 pm
- Agro-forestry	4 pm
- Charcoal Production	2 pm
- Cassamance Kiln	2 pm
T O T A L	<u>13 pm</u>

The remaining 6 persons months will be used for follow up consultancies in the 3rd and 4th implementation years, thus exhausting the funds originally budgeted for short-term technical assistance. If long-term advisor roles are to be expanded, it will require additional funds beyond those allocated for short and long-term consultancies. For this reason SREP budget modifications to strengthen the long-term overseas technical support are recommended (for details, see Budget section).

Expanded technical assistance can be accomodated without need for expanding the overall funding levels for SREP. The SREP has budgeted \$ 2,000,000 for grant funds to be used to develop and disseminate renewable energy technologies.

However, since most of these grants are for labour intensive activities most of the expenditures have been in local currency. This trend is likely to continue, and additional Sudanese Pounds for the REDG component have been requested from the Ministry of Finance and Planning (Table 4). A large percentage of the U.S. Dollar grant funds may not be required during the life of the project. The SREP could provide for increased long term technical support using these dollar funds.

Therefore, it is recommended that some REDG dollar funds be rebudgeted to provide funds for additional 24 pm technical assistance in dissemination, woodfuels combustion, and other areas.

#### **4. Peace Corps:**

To further support the organization of the dissemination activities it is proposed that Peace Corps Volunteers be recruited. The Energy Research Council has requested from Peace Corps through the USAID mission in Khartoum (Letter from Dr. Yahia Hamid to Mr. Jay Carter, November 10, 1983). Georgia Tech. and TransCentury are currently writing a proposal to Peace Corps for 6 Volunteers in the following areas:

- Two Foresters for fuelwood Project.
- Two dissemination Specialists (Communication, training, graphic arts, and publications).
- One charcoal production specialist.
- One woodfuels combustion specialist.

All Volunteers would be assigned to SREP and would be supervised by the Project Leaders to which they were assigned. Also, Sudanese Counterparts would be established which could be RERI staff or other participating institutions such as the Forest Administration, National Energy Administration.

Should timely approval for Peace Corps activity be received, the Volunteers will begin their work in October of 1984. The international costs for PCV component will be supported by Peace Corps, with some additional local currency and US Dollars required for administrative and subsistence support for the Volunteers. (See budget section for details).

## **B. Technology Development and Dissemination**

### **1. General Strategy:**

The five renewable energy technologies identified in the original implementation plan will remain the focus of SREP development and dissemination activities over the coming year.

As agreed in the original implementation plan and in subsequent discussions between the Technical Committee, the Contractor, and USAID, technology development within the RERI is to be supported by contract and Project Account Funds, with development and dissemination activities carried on by institutions outside RERI supported by grant funds.

Most development and dissemination work to date has centered around the Khartoum Province, with limited activities in the Gezira, Blue Nile, and Kordogan areas. Work over the coming year will cover a wider geographical area.

### **2. Individual Technology Development and Dissemination Strategies:**

(for work program details, see Appendix C).

#### **a. Forestry/Fuelwood Production:**

This has been the most active area of SREP work to date. Future development and dissemination will focus upon:

- Initiating new activities integrating forestry and agricultural activities.
- Encouraging tree planting on privately held lands.
- Initiating new village forestry projects.
- Increasing the availability of fuelwood species seedlings through nursery development.
- Involving the Forest Administration more with individual farmer and agricultural scheme forestry activities, and improving its extension capacity in this regard.
- Assisting, monitoring, and evaluating grant projects presently underway.

**b. Charcoal Stoves:**

In the coming year, further design development will focus on the metal/ceramic stove design (e.g. the stove now being successfully disseminated in Kenya).

Stove production and design development will be carried out to the maximum extent possible using local artisans, especially those involved in the production of traditional stoves. A program will be established for training artisans to produce the new designs.

**c. Charcoal Production:**

During the coming year work will continue in this area, including production site quantitative surveys and marketing/pricing studies. Efforts are underway to develop a system for continuous monitoring of production levels and their effects on the resource base in the Blue Nile Province.

In addition, new techniques for improving the energy efficiency of earth kilns will be introduced and field tested. Other improved kiln designs also may be tested during this period. Also, methods of using charcoal fines left at charcoal production sites and depots will be tested.

As mentioned above, all work in this area will be carried out in close cooperation with the Forest Administration and FAO Fuelwood Project.

**d. Wood Stoves:**

As mentioned in the first section of this report, closer and deeper analysis of the current wood stoves uses plus reports from work in other countries show that the potential for introducing new household wood stoves that will both save fuel and be acceptable to large numbers of people is very small. It has therefore been decided to reassess the work program for this area, and to look for industrial and commercial end-uses for woodfuels that may offer greater potential benefits for technology dissemination. A consultant is to be brought in to develop the new work program with more emphasis on industrial and commercial applications (e.g. brick kilns, bakeries, etc).

**e. Photovoltaics:**

In the first year this area was given the lowest priority. The activities in the coming year will focus on small field testing/demonstration projects initiated by the grants and the study of the market potential of photovoltaic applications. Any further expansion of activities in this area will depend on the outcome of this study and the success of testing & demonstration projects.

## C. BUDGET

### 1. Contract Budget:

#### a. Dollar Budget:

To execute the second year implementation plan as specified in the previous sections, major modifications to the contract budget are necessary in the following areas: Long term technical support, per diem, and the new area of Peace Corps Volunteers Support.

- Long- Term Technical Support - Provision of additional long term technical support for the forestry, dissemination, and woodfuels combustion technologies are figured in the revised budget estimates for this area.
- Per diem - The dollar costs of per diem for technical assistance personnel, estimated in the letter from GIT to USAID of 21 June 1983, are included here. As noted in this letter, it was not understood at the time of the negotiation of the original contract budget that all lodging costs in Sudan must be met in foreign exchange.
- Peace Corps Volunteers Support - While the international costs of the volunteers themselves will be met by Peace Corps, the costs for the field administration for the volunteers must be met from contract funds. Additional expenses for the backstopping for this program from Washington are included in modifications to the Home Office Support budget.
- Long Term Training - The long term training budget in the TransCentury subcontract is \$ 224,400. As the draft budget for one cycle of the UKH/UNM joint training program is about US \$ 200,000, it is clear that the available funds will be enough just for one cycle. Therefore additional financial support will be necessary if a second cycle is to be undertaken. The revised budget (both consolidated and in per year expenditure) is presented in Appendix D.

b. Local Currency Trust fund:

The original implementation plan indicated the need to revise this budget to reflect changes in contractor support costs due to exchange rate adjustments and other factors. In February, 1984, USAID and the Government of Sudan approved the following revised budget for this Trust Fund:

Office Support	LS	130,000
Local Travel	LS	80,000
Housing	LS	325,000
Communications	LS	90,000
Miscellaneous	LS	45,000
T O T A L	LS	670,000

c. GOS Contributions:

- 1) Project Account - the budget for this account was discussed with the Ministry of Finance and Economic Planning in February, 1984, and a revised budget was presented for USAID/GOS approval. The revised budget contained increased grant and field test support funding to reflect higher implementation targets. The budget also included new funds for an incentive system for its employees working under SREP. Revised Project Account Budget is shown in Appendix C.
- 2) Contribution in kind - this fund remains at its original level.

Table 1.

DISBURSEMENTS FOR RENEWABLE ENERGY DEVELOPMENT GRANTS 10th April 1984

GRANTEE	NUMBER	APPROVED BUDGET		CUMULATIVE ADVANCES TO DATE		DISBURSEMENTS THIS PERIOD		CUMULATIVE DISBURSEMENTS		NATURE
		LS	\$	LS	\$	LS	\$	LS	\$	
SELEIT SHELTER BELT	# 001	42365		31845						
KTM FOREST NURSERY	# 002	65450		53798		16498.58		16498.58		
IBRAHIM FARM	# 003	4000		4000						
SOBA NURSERY	# 004	45948		14040						
UM INDERABA	# 005	10500		9900						
MEDICAL VOLUNTEERS	# 006		5000							
BOGO TRADING & ENG.	# 007		18500							
FUAD MAALOUF	# 008		17000		4035					
ZEIN ELABDIN		4000								
AWODA		4000								
AHMED MOHAMMED ALI		500								
MOHAMMED ELKHAIR		500								
OMER HASSAN OMER		500								
EL AMIN MOHD A/HAFIZ		500								
SUDANESE PLTRY FARM		500								
SEDU S. LTD			10000							
CHARCOAL STOVES		12750								
<b>TOTAL</b>		<b>191513</b>	<b>50500</b>	<b>113575</b>	<b>4035</b>	<b>16490.58</b>	<b>0</b>	<b>16498.58</b>		
BEGINNING CASH BALANCE AS OF				LS		\$				
LESS: GRANT FUNDS DISBURSED THIS PERIOD				113575		4835				
PLUS: INTEREST/OTHER INCOME EARNED THIS PERIOD										
PLUS: PAYMENTS RECEIVED				250000		96000				
ENDING CASH BALANCE AS OF				136425		91965				

Table 2

US Dollar Budget Balance up to March 1984.

Target	Original budget	Expenditure to March 1984.	Remaining
1. Salaries, allowance & Fees	1,015,690	397,491	618,199
2. Travel, per diem, & Transport	237,117	116,935	120,182
3. Other direct & indirect cost	723,940	190,289	533,651
4. Participant training	long term	224,000	224,000
	short term	177,200	152,511
5. Procurement	259,424	28,592	230,832
6. Grants	2,001,000	35,000	1,966,000

Table 3

Project Account Balance for the Period June  
1983 to June 1984 (Disbursement to 30 April  
1984).

Budget Item	Budget to 30 June 84 L.S.	Expenditure to 31/3/84 L.S.	Remaining Balance L.S.
1. Training:			
Project Part- icipants	24000	1575.75	22424.25
Project Training Activities	40000	5730.70	34269.30
2. Commodities			
Petrol, oil and lubricants	24000	6303.53	17696.47
Field Test Mater.	30000	14532.91	15467.09
3. Construction	400000	4000.00	0.0
4. Others:			
Grants	250000	113575	136425
Field Test Support	22000	23899.98	1899.98
Consulting and subcontracting	60000	55974.72	4025.28
TOTAL	850000	622388.6	227611.4

Table 4

Proposed Revised Budget for Project Account  
(in LS 1000)

Note: Proposed revised  
 Figures & totals in Parentheses

Item	FY 83/84	FY 84/85	FY85/86	FY 86/87	Totals
Grants .....	250	250	300	200	1000
		(500)	(500)	(250)	(1500)
Field Test Support	22	11	11	11	55
		(25)	(25)	(25)	(97)
Incentives .....	-	(50)	(50)	(50)	(150)
Field Test Materials	30	15	15	15	75
POL	24	12	14	17	67
Project trag.Activities	40	20	22	26	108
Participants .....	24	10	6	2	42
Construction .....	400	-	-	-	400
Subcontracts .....	60	35	35	35	165
T O T A L S .....	850	353	403	306	1912
		(667)	(667)	(420)	(2604)

The Democratic Republic Of The Sudan  
THE NATIONAL COUNCIL FOR RESEARCH  
ENERGY RESEARCH COUNCIL

P. O. Box 4032 Khartoum Centre

Tel : 80337

Telegraphic Address " Buhuth "

SUDAN RENEWABLE ENERGY PROJECT

TEL: 74992

TELEX : 22875 SREP.



جمهورية السودان الديمقراطية  
المجلس القومي للبحوث  
مجلس أبحاث الطاقة  
الغرض من صياغة : ٤٠٣٢ / القرض وسط  
٨٠٣٣٧  
القنصلية الشغرافية " بحوث "

Appendix A

( In Your Reply Please Refer To Our ) E. R. C.

Date .....9th November, 1983.

Sent 10/11/83

ملف رقم / م / ط /  
التاريخ /

Victor Wahba,  
Ministry of Finance and Economic Planning,  
Khartoum.

Dear Victor,

Forwarded herewith is the job description for the SREP and SEP Coordinator appointed by the Energy Research Council (ERC). This is in addition to our previous notification to you of the appointment of Dr. Hassan Wardi as Coordinator to succeed Dr. Yahia Hassan Hamid, whose term of office expired July, 31, 1983.

Sincerely yours,

Signed + sent 10/11/83

Dr. Hassan Wardi

Director, Energy Research Council  
& Coordinator, SREP/ SEP

Encl: Coordinator's Duties & Responsibilities

cc : USAID Energy Office SREP.

SREP & SEP Coordinator  
Duties & Responsibilities

**Purpose:**

The Coordinator for the Sudan Renewable Energy Project (SREP) and the Special Energy Project (SEP) is appointed by the Energy Research Council to coordinate and expedite execution of the projects sponsored by USAID (SREP) and the GTZ (SEP).

**Term of Office:**

By decision of the Energy Research Council (ERC) the Director of the ERC also serves as the Coordinator for the SREP and SEP. Therefore the coordinator's term of office is effective as long as he remains the Director of the ERC.

**Authority:**

The Coordinator is the implementing officer of the ERC and is directly responsible to, and supervised by, the Technical Committee of the ERC, which has been authorized to act for the ERC with respect to the SREP. The Coordinator shall execute ERC Technical Committee policy directives, and shall be assisted in these tasks by one or more assistants appointed by the ERC.

**Duties:**

The Coordinator shall facilitate the expeditious execution of all activities of the SREP as detailed by the ERC approved implementation plan, and under broad policy guidelines and general budgetary allocations set forth by the Technical Committee of the ERC.

The Coordinator shall:

- (1) Coordinate, facilitate, and expedite all project activities under both the GTZ sponsored SEP and the USAID sponsored SREP.
- (2) Provide advice and guidance to the staffs of SEP and SREP to ensure that all project objectives are effectively and expeditiously met in accordance with Sudanese commitments to the donor agencies.

- (3) Review and approve all implementation plan activities under the SREP which fall within the general technical, budgetary and administrative guidelines set forth by the ERC Technical Committee.
- (4) Request in writing USAID approval for all activities which require separate USAID concurrence in accordance with the project agreement governing the SREP.
- (5) Refer matters requiring policy interpretation and guidance to the Technical Committee of the ERC for resolution.
- (6) Provide the Technical Committee of the ERC and Ministry of Planning concise written periodic reports of the substantive status and progress of the SREP.
- (7) Carry out other duties related to the SREP and SEP as may be assigned by the Technical Committee of the ERC.

**Delegation:**

In the absence of the Coordinator, or his inability to act, the Assistant Coordinator(s) shall act for him in all of the above. The Assistant Coordinator(s) shall also carry out other duties related to the SREP as may be assigned from time to time by the Coordinator.

MARCH 7, 1984.

REVIEWED MARCH 19, 1984.

## TRAINING SCHEDULE

STAFF	TRAINING DESCRIPTION	1984		1985		1986	
		JULY	OCT.	JAN. APRIL	JULY	OCT.	JAN. APRIL
<u>Fuelwood:</u>							
1. Hamza Hamoudi	Agro-Forestry Field trip to Sahelian Country (Third Country)		One month x-----x				
2. Khalid El Sharif	"			One month x-----x			
3. Mohd Hassan El Gizouli	"				One month x-----x		
4. Foresters working on Project	Training Program Organized on Nursery care (Possible Grant Proposal From Ranger College) (Local Training).			One month x-----x			
5. Maha Hassan Osman	Visit Agro Forestry/Fuelwood Activity (Third Country).					x-----x	

MARCH 7, 1984.

REVIEWED MARCH 19, 1984.

TRAINING SCHEDULE

STAFF	TRAINING DESCRIPTION	1984		JAN. APRIL	1985		JAN. APRIL
		JULY	OCT.		JULY	OCT.	
<u>CHARCOAL PRODUCTION:</u>							
6. A. H. Hood	Bioenergy (Sweden)	June 10-26 x-----x					
7. Nasron	Trip to investigate Charcoal Kiln designs (one third country)			15 days x-----x			
8. Asma	Charcoal Production (third country).				One month x-----x		
<u>Charcoal Stoves:</u>							
9. El Tayeb El Bashir	Visit to see manufacturing techniques of wood charcoal stoves. (Third country)		One month x-----x				
10. Fadia Mahgoub	Visit to see dissemination techniques for wood & charcoal stove promotion (third country)		One month x-----x				
11. Shadia Nasr El Din.				One month x-----x			

MARCH 7, 1984.

REVIEWED MARCH 19, 1984.

TRAINING SCHEDULE

STAFF	TRAINING DESCRIPTION	1984		1985			1986	
		JULY	OCT.	JAN. APRIL	JULY	OCT.	JAN. APRIL	
Wood Stoves:								
12. Shommo	Field trip to see new design and production techniques for wood utilization emphasis on commercial & Industrial wood utilization (third country).							
13. Hassan Busheer								
13A. Igbal								
P.V. <i>Asmi</i>								
14. <del>Hassan Abdella</del> or Major Abdella	Field visit to Kenya to meet with P.V. installers to determine practical problem & counter in installation & maintenance of P.V. Systems.							
	Field trip to Yemen for PV installers workshop							
Dissemination:								
15. Gaafar El FAKI	Visit third country with similar dissemination organization (Kenya, Costa Rica, or India).							

One month  
x-----x

2 weeks  
x-----x

May 21-2  
x-----x

One month  
x-----x

MARCH 7, 1984.

REVIEWED MARCH 19, 1984.

TRAINING SCHEDULE

STAFF	TRAINING DESCRIPTION	1984		JAN.	1985		JAN.	1986	
		JULY	OCT.		APRIL	JULY		APRIL	
16. Awatif Mohd.	Information & Dissemination to public visit third country (Kenya, Costa Rica).				x-----x				
<u>Administration:</u>									
17. Hassan Wardi	Field Trip to Energy Project accompanied by Dissemination Head Botswana-India or other.				x-----x				
18. Mohd Osman	RID Project Management U. of Denver.				x-----x				
19. El Tayib Idris	UNM training plus trip to West Texas State (Wind)				x-----x				
20. Gumma SREP	Accounting, Computer Language or Computer training ] Local								
21. Sanaa SREP									
22. Hawa SREP									
23. Yousif	[ Procurement ]								
24. Osman Diab									
25. Mohamed									
Typist (Local)									
PROJECT Evaluation	Available to RERI and related staff.				x-----x				

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ANNUAL WORK PLAN

Activities	1984						1985					RESPONSIBLE	
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL		MAY
1) Add 15 more small farmer agro-forestry grants in Khartoum area			x										RERI/Central Forest Admin.
2) Monitor and evaluate performance of existing small farmer grant activities													RERI
3) Expand Small farmer agroforestry grants to Wad Medani/Gezira area			x										RERI/Regional Forests Admin.
4) Establish Planting/extension program in selected district of Northern Kordofan					x								RERI/Regional Forests Admin.
5) Completion of Seleit Shelterbelt grant						x							RERI/Seleit/Central Forests Admin.
6) Evaluation and Expansion of activities at Seleit Scheme							x						RERI
7) Support to Khartoum and Soba Nurseries											x		RERI/Khartoum Provincial Government/Central Forest Admin.
8) Community Forestry at Umlinderaba												x	RERI/Kordofan Regional Forests Admin. Villagers Consultant, SREP
9) Present Interim Report on SREP Forestry Activities.			x		x								

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PROJECT: Charcoal Stoves

PREPARED: March 25, 1984

ANNUAL WORK PLAN

Activities	1984						1985					RESPONSIBLE	
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL		MAY
1) <u>Dissemination of Improved Stove:</u>													
- Technical Assistance to Producers.....													RERI
- Demonstration and Promotion...													RERI
- Establishment of Monitoring System .....	x												RERI
- Surveys of Production and Sales		x			x			x				x	RERI/PVD's
- Consumer Satisfaction Surveys				x			x			x			RERI/PVD's
- Training Workshop .....				x									RERI
2) <u>Development of Metal/Ceramic Stove</u>													
- Prototype Completed .....		x	x										University of Khartoum, <del>RERI</del>
- Field Testing .....				x				x					Local artisans U OF K., RERI
- Contest or Pilot Production...									x				RERI

PROJECT: CHARCOAL PRODUCTION

PREPARED: March 25, 1984

ANNUAL WORK PLAN

Activities	1984						1985			RESPONSIBLE			
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.		MAR.	APRIL	MAY
1) Publication of Conversion Study Report	x	x											RERI (Dissemination)
2) Field Test stoves which use charcoal fines.....							x						RERI/Forest Admin.
3) Determine market acceptability of charcoal fines stoves.....								x					RERI (Dissemination)
4) Field Test briquetting/pelletizing Using charcoal fines..							x						RERI
5) Introduce small metal kilns in forest research or part of overall management program.....							x						RERI & Forestry Res. Center
6) Field Demonstration of Cassamence Kiln in Blue Nile Province							x						RERI
7) Publication of promotional materials on Cassamence Kilns...								x					RERI
8) Dev. training course for new kilns applications .....								x					RERI

CT: WOOD FUELS COMBUSTION

PREPARED: March 26, 1985

ANNUAL WORK PLAN

Activities	1984						1985					RESPONSIBLE.	
	JUNE	JULY	AUG.	SEPT	OCT.	NOV	DEC.	JAN.	FEB.	MAR.	APRIL		MAY
Compile listing of new designs for household stoves using saw-dust, agricultural residues and wood.....	x												RERI (Shommo)
Field test 2 designs.....	x												RERI (Shommo)
Overseas consult. to help define project and initiate activities			x-----5 Months-----x										
Survey of wood fuel use in commercial and industrial sectors.....	x												NEA (Grant)
Select industries and introduce prototypes designs for improved wood fuel utilization.....			x										RERI/NEA/Consultant.
Field test designs .....					x								RERI (Shommo)
Evaluate results .....						x							RERI (Shommo) & Consultant
Develop dissemination strategy to promote new designs.....							x						RERI (Gaafar El Faki & Awatif)
Followup visit consultant review progress.....												x	1 1/2 Month

OBJECT: PHOTOVOLTAICS

PREPARED: March 26, 1984

ANNUAL WORK PLAN

Activities	1984						1985			RESPONSIBLE			
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.		MAR.	APRIL	MAY
Four grants given to field test and promote use of P.V. system in rural areas.....x													RERI
<u>1. Self Contained lantern/Grant</u>													
a. 80 lanterns distributed to rural villages.....		x---x											
b. Monitoring (Field Visits).....						x---x		x---x			x---x		GRANTEE/RERI
c. Evaluation Report.....												x---x	
<u>i. Centralized Charging Lantern System.....</u>													
a. Villages selected and equipment installed .....		x-----x											
b. Monitoring (field visits).....													
c. Evaluation report .....												x---x	Grantee/RERI
<u>1. Refrigeration System</u>													
a. Installation													
b. Monitoring (Field Visit) .....				x---x				x---x		x---x			GRANTEE/RERI
<u>5. One Other PV System</u>													
A. Installation			x---x										
B. Monitoring .....								x---x					GRANTEE/RERI
C. Evaluation												x---x	

OBJECT: Photovoltaic

PREPARED: March 26, 1984

ANNUAL WORK PLAN

Activities	1984						1985					RESPONSIBLE	
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL		MAY
. Study of Economic and technical Feasibility of Photovoltaic system for Irrigation in Sudan  - Scope of Work completed - Surveys..... - Analysis..... - Report .....													RERI
	x		x										
			x	x									
					x								

PROJECT: DISSEMINATION

A N N U A L W O R K P L A N

ACTIVITIES	1984						1985				RESPONSIBLE.		
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.		APRIL.	MAY
<p><u>AREA OF ACTIVITIES:</u></p> <p>1. CHARCOAL STOVE DISSEMINATION</p> <p>A. SREP EDUCATIONAL MATERIALS</p> <p><u>Renewable Energy Reports</u></p> <p>No. 006 Charcoal Stoves Dissemination by Max Kinyaangui</p> <p>No 007 Development of Canun Aduga by Shadia N. E.D. &amp; Fadia</p> <p>No 008 Production methods of Canun Aduga in Khartoum Area.</p> <p>B. Mass Media Channels</p> <p>Newspapers: <u>All Sahafa</u> and ElAyaam: Advantage of Charcoal stoves with announcement of retailers who sell stove (article/announcement will be repeated)</p> <p>Radio Programming: Advertisement of advantages of Canun aduga</p>			_____										<p>SOMAYA M.S. Gaafar Elfaki</p> <p>Somaya M.S. Gaafar Elfaki</p> <p>Somaya M. S. Gaafar Elfaki</p> <p>Awatif M.</p> <p>Awatif M.</p>

PROJECT: DISSEMINATION

ANNUAL WORK PLAN

ACTIVITIES	1984						1985					RESPONSIBLE.	
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL.		MAY
Mass Media Channel (Cont.) NCR Bulletin Television programming: A short announcement of where the stoves are available:retailers													Awatif M.
C. Group Meetings 1. Demonstrations: a. Small demonstrations at retailers, distributors and small producers and interest groups such as Govt. agencies twice a month													Somaya M.S.
Suk Demonstrations once a month													Somaya M.S. Fadia El Tayeb Gaafar El Faki
2. Workshop: Preparation, planning, & realization of workshop for producers & extension agencies who will or are manufacturing the new stoves													Ditto  Technical Assistance Awatif M. Max K. Gaafar El Faki Tayeb El-Bashir Fadia - Somaya

PROJECT: DISSEMINATION

ANNUAL WORK PLAN

ACTIVITIES	1984						1985					RESPONSIBLE		
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL.		MAY	
<p>2. <u>FUELWood Production:</u></p> <p>SREP EDUCATIONAL MATERIALS  RE: Development and Utilization  of Renewable Energy (Arabic)</p> <p>No 2 How to Plant Shelterbelts _____</p> <p>No. 3 How to transplant seedlings _____</p> <p>No.4 How to measure shelterbelts _____</p> <p><u>Renewable Energy Reports</u></p> <p>001 Study for the Establishment  of Forestry Plantation shelter-  belts and Canal Planting -Abdel  A. Bayoumi et al. _____</p> <p>003 Village Biomass Needs  North Kordofan Region by M.O.  et al _____</p> <p>B. <u>Mass Media Channels :</u></p> <p>Newspapers :</p> <p>El Ayaam:news article on Seleit  Project and SREP Project of  shelterbelts _____</p> <p>El Sahafa short article announc-  ing new SREP publications _____</p>													Awatif M.	
														Somaya M.S.
														Somaya M. S.

PROJECT: DISSEMINATION

ANNUAL WORK PLAN

ACTIVITIES	1984						1985					RESPONSIBLE.	
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL.		MAY
<p>3. <u>Charcoal Production :</u></p> <p>A. <u>SREP Educational Materials Renewable Energy Reports</u></p> <p>004 Hassan Osman. Review of charcoal production</p> <p>005 Gaafar El Faki. Charcoal Production and marketing.</p> <p>B. Further Evaluation/Educational materials.</p> <p><u>Renewable Energy Reports :</u></p> <p>009 Cassamance Kilns Group meetings</p>													<p>Awatif Mahmoud</p> <p>Somaya M.S. Gaafar El Faki</p> <p>Somaya M. S. Gaafar El Faki</p>

PROJECT: DISSEMINATION

A N N U A L W O R K P L A N

ACTIVITIES	1984						1985			RESPONSIBLE.			
	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.		MAR.	APRIL.	MAY
<p>4. <u>PHOTOVOLTAIC CELLS</u></p> <p>A. SREP Educational Materials  <u>DURE: Development and Utilization of Renewable Energy :</u></p> <p>No. 4 what are photovoltaic cells</p> <p>B. <u>Mass Media Channels :</u></p> <p>Newspaper articles en El Ayaam or ALSahafa about the development of solar cells in Sudan</p> <p>5. <u>DEVELOPMENT OF RENEWABLE ENERGY DOCUMENTATION CENTER :</u></p> <p>The planning of the specialized Documentation Center for staff and other technical personnel that provides educational materials for development research and dissemination</p>													<p>Somaya Awatif</p> <p>Somaya M.S. Awatif M.</p> <p>Gaafar El Fak  Somaya M.S.  T.A. Consultant  PCV'S  Awatif M.</p>

May 1984

RENEWABLE ENERGY TECHNOLOGY  
 TRAINING PROGRAM BUDGET  
 ESTIMATE FOR FIRST CYCLE

	<u>UNM</u>	<u>UKH</u>
<u>1984</u>		
Bill Gross trip to KHT (May 84)	11,435	
Fall preparation at UNM	1,250	
U of Khartoum Costs		77,385 LS (\$43,000 equiv)
 <u>1985</u>		
Spring preparation at UNM	2,500	
Gross trip to KHT (Dec 85)	7,452	
Misc	500	
8 students at UNM	120,000	
Student travel	15,500	
Registration costs at UKH (1/2 fee)		12,000 (\$6,700 equiv)
	158,637	49,700
 GRAND TOTAL	 <u>\$208,337</u>	