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PROJET ENERGIE RENOUVELABLE  
ISERST VITA

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REPUBLIQUE DE DJIBOUTI

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AID / ISERST / VITA

ENERGY INITIATIVES PROJECT

Contract n° 603 - 0013 - C - 00 - 2001 - 00

FOURTH PROJECT QUARTERLY REPORT

July - September 1983

Submitted to : AID/Djibouti

Submitted by : Steve Hirsch, VITA Chief of Party, Djibouti

October 11, 1983

Summary of Important Fourth Quarter Events

During this summer quarter the staff followed a staggered vacation schedule. Despite this and the Djibouti summer temperatures, field work continued at a rapid pace.

Construction of the new ISERST Renewable Energy Building (IREB) was begun and is on schedule.

Bids for the 5KW photovoltaic system were received by VITA/Rosslyn, analysed by a group of staff members and VITA Volunteers and the contract awarded to Arco Solar of Chatsworth, California.

A permanent Djiboutian counterpart was assigned to the project by ISERST.

Energy Auditor Seymour Jarmul began his eight week consultancy in Djibouti.

A revised staffing plan and budget for the project was agreed upon with ISERST.

VITA was given tentative USAID approval for a 2 year expatriate technician position.

Informational and Analytical Base

Meteorological Data Collection

Climatological data continues to be collected and analysed by the ISERST/VITA R.E. staff. Problems continue to occur with the 7 Climatronics units and a high level of maintenance/repair is required.

During the Chief of Party's R&R he visited Climatronics headquarters in Bohemia, New York to discuss what VITA has considered relatively poor after-sales service. Based on the results of this meeting and the fact that overseas sales represent only 3% of Climatronics business, it appears unlikely that Climatronics support for their equipment will improve.

VITA home office staff are now being sent copies of all meteorological data and are assessing the availability in Djibouti of useful solar and wind energy resources.

Pilot Interventions/Prototype Research

(a) Lycee Photovoltaic Installation

As a result of information and assistance provided to the Djibouti Lycee by ISERST/VITA, the Ministry of Education has decided to provide financing for a photovoltaic installation that will power the Lycee physics laboratory. Installation of the system will be performed by the local vocational school. Bids had been submitted for the job by Solarex Corporation and Arco Solar and the Lycee selected the Arco proposal as most suited to their needs. ISERST/VITA will be providing technical assistance to the Ministry of Education in placing the order and installing the equipment. Ministry personnel have indicated that if this initial installation is successful, they would be interested in ordering a much larger system to provide power for the new Lycee d'Enseignement Professionnel which will be built late next year.

(b) Solar Pump Demonstrations

Demonstrations of the Solar Electric International 300 watt solar water pump were held this quarter in collaboration with Genie Rural. The demonstrations took place in Dikhil, As Eyla, Ali Sabieh and Tadjourah.

Newly arrived U.S. Ambassador Adams was present at the Dikhil, Ali Sabieh and Tadjourah demonstrations and encouraged ISERST/VITA to consider technical assistance activities together with Genie Rural for larger scale photovoltaic water pumping systems.

As a result of these demonstrations, the Ali Sabieh District Commissioner has requested a number of international organizations to provide him with solar pumps for the agricultural activities in his region.

Although the pump demonstration program was successful, two design problems with the SEI pump system have been identified. A letter has been sent from ISERST/VITA to the local pump supplier informing him of these problems and discussions are underway to resolve them.

(c) Waste Oil Heating

Plans and a budget have been finalized for construction of a second experimental waste oil stove in collaboration with the Ministry of Industry, Commerce and Tourism. The approximate 3m<sup>3</sup> kiln will be built from locally available materials and will burn waste oil from the Electricite

de Djibouti Power Generation Plant. Total construction costs for the plant will be approximately \$1,500, 60% of which will be paid for by the Ministry.

(d) Cinva Ram Construction

One of the two cinva ram presses received last quarter has been put into use and a collaborative testing program with a local Djiboutian entrepreneur and Travaux Publics has been initiated. If the program is successful, the Director of the Djibouti Vocational School (Lycee d'Enseignement Professionnel) has indicated that both his students and teachers would be interested in using/promoting the technique.

The President's Urban Planning Office (Cellule de l'Urbanisme) has been extremely supportive of the ISERST/VITA cinva ram block work and would like ISERST/VITA to build a number of pilot lodging units in the poorest section of Djibouti town (Balbala). This is envisioned by the Urban Planning Office as the first step in a much larger program that would include approximately 100 housing units built from locally available materials.

(e) Wind Pumping

ISERST/VITA received a report from two French Volontaires au Progres (the equivalent of U.S. Peace Corps) on test results of a Sparco wind-pump provided under the project. Although the rated capacity of the set is 113 lit. /hour, it was found by the 2 French volunteers that the actual output was much lower. Clogging problems with the foot valve were also encountered. The above results confirmed the initial findings of VITA Wind Specialist Jon Hodgkin and, as a result, ISERST/VITA has decided to discourage any further use of this windpump in Djibouti.

Assessment and Dissemination of Research Results

(a) Energy Efficient Architectural Design Manual

Copies of both the English and French version of the Dan Dunham architectural design manual were received in Djibouti and a distribution list is being prepared.

(b) IREB Air Conditioning Study

The VITA home office, in collaboration with a number of VITA Volunteer specialists, completed an analysis of the airconditioning needs of the new ISERST Renewable Energy Building. The analysis showed that the building, as designed, would require an average of 495 BTU/hour/meter<sup>2</sup> of cooling capacity. This figure can be compared with an average cooling capacity of 800 BTU/hour/meter<sup>2</sup> that is used in Djibouti for other non-energy-efficient buildings.

As a result of this study, the number of airconditioners that will be used in the ISERST building will be reduced from an initially-planned 21 to 17.

Energy Conservation Practices

(a) ISERST Renewable Energy Building Construction

Construction began on the ISERST Renewable Energy Building (IREB) in July and has proceeded smoothly since that time. At present, the foundations and floors have been poured as have most of the interior walls. Approximately one third of the exterior walls have been poured as well. The local construction company, Touzet International, has been adhering closely to the building schedule initially agreed upon.

Weekly site meetings take place that include Touzet representatives, Architect Bernard Cazaban, ISERST Administrative Director Fourki and the Chief of Party. A log book is kept of the issues raised and decisions made at these meetings.

(b) IREB Photovoltaic Installation

VITA Volunteers, home office staff and the Chief of Party evaluated the bids for the IREB Photovoltaic installation and selected Arco Solar as the contractor. The cost will be \$66,000 for the 5KW, 220 VAC system which will power a portion of the lights, fans and a refrigerator. As part of the design it will be possible to manually switch to grid power should a problem develop with the photovoltaic system.

It is envisioned that VITA staff member Jon Hodgkin will come to Djibouti in January, 1984 to assist with both the ISERST and Lycee installations.

(c) IREB Furniture Order

Judy Hirsch has prepared a furniture list and layout for the IREB and VITA/Roslyn will be placing the order in the U.S. in the near future. All building furniture will be paid for by VITA under the project budget.

(d) Building Energy Audit Consultancy

Energy Building Auditor Seymour Jarmul arrived in Djibouti on September 15 to begin his 6 week incountry consultancy. Travaux Publics is collaborating with ISERST/VITA on the effort and has assigned a full time technician to be trained by Seymour Jarmul. ISERST Technician Abdoukarim Moussa Yacin is also being trained in the auditing procedures and use of the measuring instruments Jarmul brought with him. A number of local buildings have been audited and preliminary results indicate that

substantial energy savings could be realized through improved conservation practices. A locally-held seminar and preparation of a Djibouti-oriented energy conservation manual are envisioned as part of this consultancy.

Policy and Planning Recommendations to Government/Miscellaneous

(a) Arrival of New AID Representative

Newly appointed AID Representative Jon Luwigren arrived in Djibouti on September 14 and has met with the COP to discuss the project on a number of occasions.

(b) Project Counterpart

A Djiboutian counterpart to the Chief of Party was formally assigned to the project by ISERST on October 1, 1983. M. Abdourahman Farah Hassan is 26 years old and completed 2 years of University level physics/chemistry studies in Morocco following his graduation from the Djibouti Lycee.

(c) ISERST Project Staffing Plan/Budget

The Chief of Party and ISERST have completed a planning exercise to (1) more accurately assess anticipated Djiboutian staff needs during the life of the project and (2) assist ISERST to budget accordingly. The effort was undertaken to help determine the required level of GROD financial support to the project (see third Project Quarterly Report, Problems and Issues-Section). As a result of this exercise, ISERST has tentatively agreed to provide a counterpart and seven technicians during the life of the project as well as two meteorological data analysts for two years. This as compared to the counterpart and only two technicians that are called for under the AID/GROD Project Agreement. Formalization of this change has yet to take place.

(d) Project Technicians

As a result of the above, ISERST has hired a second Djiboutian technician and has indicated its' willingness to hire a third Djiboutian technician beginning December 1.

Expatriate technician Rob Fraser began a four month extension to his technical services contract on September 1, 1983. Rob successfully supervised the project during the COP's R&R and at the same time, arranged four up-country solar pump demonstrations.

AID/Djibouti has tentatively approved the addition of a 2 year expatriate technician position to be funded under the project. Details are presently being worked out between USAID and VITA/Rossllyn. VITA/Rossllyn is interviewing potential candidates for the job and it is hoped that the technician will arrive in Djibouti o/a January 2, 1983.

(e) Personnel Status Report

At present, the Djiboutian project staff consists of :

- one counterpart
- two project technician/apprentices
- two meteorological data analysts

The expatriate staff consist of

- one secretary
- one short term electro-mechanical technician (through 12/31/33)
- one part time building engineer (presently on maternity leave)
- one chief of Party

(f) Miscellaneous

ISERST Director Anis Abdallah visited VITA/Roslyn on September 22 during a stay in Washington D.C. for a World Bank meeting.

Both USAID and ISERST have authorized the purchase of a third project vehicle for project-related use by consultants and the Djiboutian counterpart.

Private Sector Initiatives

(a) Cinva Ram Construction

Increasing support is being provided under the project to Abaneh Farah, the Djiboutian businessman who has purchased a gasoline-powered cinva ram brick machine. Farah recently received an order for cinva ram bricks to build two private houses in town. ISERST/VITA has been assisting him with assuring quality control of the bricks in collaborations with Travaux Publics.

Abaneh Farah is also allowing ISERST/VITA to use his land and materials to prepare bricks made with a manually powered cinva ram machine. Approximately 25 bricks of varying compositions have been manufactured and will be tested by Travaux Publics in the near future.

(b) Thermal Insulation Material

The demonstration house built by Isotherma, a local polystyrene manufacturer, will be audited by Seymour Tarnul in order to promote increased sales in Djibouti of this insulating material. As another means of promoting its use, this material is being used in the IREB and is partially responsible for the decreased cooling capacity that will be required to maintain a comfortable working temperature in the building.

(c) High Efficiency Air Conditioners

High efficiency Philco airconditioners, supplied by the local Philco agent, will be used in the IREB. As mentioned above, through the use of these high efficiency machines, fewer and smaller airconditioning units will be needed in the building than originally planned.

(d) Photovoltaic Power Generation

Arco Solar of Chatsworth, California has been given the contract to supply photovoltaic equipment for both the ISERST and Lycée building installations. It is hoped, through these contracts, that use of solar energy equipment will become increasingly commonplace in Djibouti and that local merchants will market it on a regular basis.

Problems and Issues

- As mentioned in Section 5, ISERST has tentatively agreed to expand the staff it will provide for the project. Since this expansion would alter the GROD contribution cited in the AID/GROD project Grant Agreement, it would be helpful if the proposed changes were discussed and agreed upon by AID and the GROD soon as possible.

- ISERST is presently researching costs that are related to the new Renewable Energy Building that they anticipate they might have difficulty covering (such as fencing, telephone, water and electricity service, etc). It is probable ISERST will then propose to USAID and VITA the use of the remaining building funds to cover some of these costs. ISERST, USAID and VITA should anticipate meeting together in the near future to finalize this change.

- ISERST, USAID and VITA have agreed upon the need for a 2 year expatriate technician to assist the field testing, demonstration and training aspects of the project. This decision should be formalized as quickly as possible so that VITA/Rossllyn can hire a qualified technician and have him arrive in Djibouti o/a January 2, 1984.

- VITA/Rossllyn has requested that AID finance an increased level of home office support for the Energy Initiatives Project. AID/Djibouti has requested that VITA/Rossllyn provide justification for this increased level, which VITA/Rossllyn is in the process of preparing.

VITA/Rossllyn support to date has been an important component of the project. It is the hope of the field office that the high quality of that support will continue as the project moves increasingly into the implementation phases.

Fifth Quarter Project Projections

- Construction of the ISERST Renewable Energy Building will continue
- The Arco Solar photovoltaic equipment will arrive by sea freight
- Furniture for the IREB will be ordered by VITA/Rossllyn
- Meteorological data collection and analysis will continue under the supervision of Counterpart Abdoulrahman
- Wind speed and water pumping data will be collected by Catholic Relief Services/Djibouti for the Aramadoule windmill
- Sy Jarmul will complete his energy audit consultancy
- Design problems discovered on the SEI Solar Water Pump will be addressed so that the pump system can, hopefully, be made available for sale by the private sector in Djibouti with full ISERST/VITA support
- The Lycee photovoltaic system will be ordered
- Technician Abdoulkarim Moussa Yacin, will, hopefully, be accepted for the spring U. of Florida/Gainesville Renewable Energy Training Program
- Energy Economist Jess Ribot will begin his energy assessment consultancy in mid-November
- VITA Energy Specialist Jon Hodgkin will plan his followup visit to Djibouti as was envisioned last year at the end of his initial visit. Jon will review Climatronics and wind related activities to date and oversee the installation of the IREB and Lycee photovoltaic installations
- USAID will authorize and VITA/Rossllyn will hire an expatriate technician who will arrive in Djibouti o/a January 2, 1984
- Engineer Judy Hirsch will return from maternity leave and resume supervision of work on the IREB and cinva ram block construction

Copies to : VITA/Rossllyn  
USAID/Mali  
USAID/Khartoum  
REDSO/Nairobi  
VITA/Somalia  
VITA/Uppa Volta

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A L'ATTENTION DE MONSIEUR TOUZET  
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PRESIDENCE DE LA REPUBLIQUE POUR SOULIGNER LE RECONTENTEMENT DE  
L'ISERST, VITA ET L'AMBASSADE DES ETATS-UNIS.

AMIS ABDALLAH  
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