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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

FIFTH PROJECT QUARTERLY REPORT

October - December 1983

Submitted to : AID/Djibouti

Submitted by : Steve Hirsch VITA Chief of Party, DJIBOUTI

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Summary of Important Fifth Quarter Events

The high point of the quarter was Architect Sy Jarmul's 6 week consultancy on more efficient use of energy in office buildings and housing. The consultancy was carried out in collaboration with Travaux Publics and culminated in a one day seminar on energy conservation that was attented by over 40 representatives from both the public and private sectors. The consultancy evoked a high level of interest in energy conservation among both Djiboutians and expatriates and, as a result, it appears likely this area will become one of the priorities during the next 2½ years of the project.

Other notable fifth quarter project events were :

- A solar pump demonstration was held in Obock that was attented by local inhabitants, the Obock Commissioner and US Ambassador Adams;
- The Djibouti energy assessment began with the arrival of energy analyst Jesse Ribot on November 20;
- Travaux Publics has tentatively agreed to collaborate with ISERST/VITA on the construction of a number of low cost,energy-efficient demonstration housing units;
- Most of the ISERST 5 kilowatt photovoltaic system equipment arrived in Djibouti;
- ISERST/VITA received an Apple IIe computer;
- REDSO/Nairobi Construction Advisor Bob Adams visited Djibouti to inspect work on the ISERST Renewable Energy Building;
- Volunteer Technician Steve McGoff arrived to replace Rob Fraser;
- A two cubic meter waste oil stove was built and fired in collaboration with the Ministry of Commerce, Transport and Tourism;
- Baby Jack was born to Steve and Judy Hirsch;
- Judy Hirsch returned to Djibouti and resumed construction supervision work on the ISERST Renewable Energy Building (IREB);

At this point it is worth mentioning that the strategy agreed upon between AID/Djibouti, ISERST and VITA in February, 1983 was to accord highest priority, during the first two years of the project, to the construction of the ISERST building and to those project components which would establish the national energy data base. This data base would then be used to make decisions on prototype, field and training activities for the remainder of the project. This strategy has been followed and the building and data base components of the project (meteorological data collection, energy audit, energy assessment) are well underway. At the

same time prototype and training activities have been begun in a number of areas when time and manpower were available.

As the project progresses it is anticipated that the priority will shift gradually to prototype, field and training activities and that data collection/analysis will become of secondary importance.

Fifth Quarter Activities

1. Informational and Analytical Base

(a) Meteorological Data Collection

Meteorological data continues to be collected and analyzed from 7 sites by the ISERST/VITA staff using the Climatronics solar-powered equipment. Although one solar panel was destroyed by birds and other minor problems continue to occur, all seven units are in working order.

(b) Apple IIe Computer

The Project received an Apple IIe computer that is intended for use with the energy assessment, analysis of the Climatronics meteorological data word processing and for handling ISERST/VITA financial accounts. Judy Hirsch is overseeing the use of the computer and will be assisting secretary Chantal Carpentier with t's use in the office. The ISERST central office is also interested in computerizing its' general accounting system and training will be conducted for Djiboutian staff members presently working in the accounting section.

(c) Energy Assessment

Energy Analyst Jesse Ribot arrived on November 20 to begin phase one of the Djibouti Energy Assessment. Phase one consists mainly of contacting relevant GROD institutions and collecting and analysing existing energy-related data. A total of three phases have been tentatively planned for the assessment and terms of reference for the two latter phases will be prepared as part of phase one.

Jesse Ribot will be joined by Engineer/Economist Peter Maxson on January 1, 1984 who will remain in Djibouti for one month to complete the field portion and then prepare the final report for phase one.

Initial response from the GROD institutions contacted regarding the assessment has been positive but a counterpart GROD institution or group of qualified Djiboutians to undertake a study of this type on an ongoing basis has not yet been identified (see "Problems and Issues" section).

2. Pilot Interventions/Prototype Research

(a) Lycee Photovoltaic System

VITA/Rosslyn placed an order with Arco Solar for the Lycee photovoltaic system. Installation of the system will be carried out during February 1984.

(b) Obock Solar Pump

At the request of the Commissioner of Obock and Catholic Relief Services, the COP took a two day trip along the east coast of the Obock district to assess the feasibility of (1) repairing three presently-existing but non-operating windmills in the area and (2) providing a test/demonstration solar pump for the Obock Primary School garden. In addition, the Project's SEI Sunpump was brought to Obock and a demonstration was held for the Commissioner and local inhabitants. US Ambassador Adams was also present.

As a result of the COP's Obock trip it was decided that repair of the windmills would be considered at a later date and that a solar pump would be purchased under the project for the Obock School garden. The Obock Commissioner and Catholic Relief Services will provide the necessary staff and materials to ensure the proper use, maintenance and data collection for the pump installation. ISERST/VITA will train local personnel to perform the above tasks.

(c) Cinva Ram Construction

A demonstration was held on October 18, 1983 for approximately 25 students and teachers from the Djibouti Lycee d'Enseignement Professionel (LEP) in the preparation of materials and fabrication of cement-stabilized cinva ram bricks with a manual press. As a result it is hoped the LEP will include cinva ram brick construction as part of their ongoing masonry training program.

(d) Waste Oil Heating

A two cubic meter prototype waste oil stove was built in collaboration with the Ministry of Commerce, Transport and Tourism. The kiln was built almost exclusively from locally available materials (except for a number of imported refractory bricks) and has been successfully fired four times. Temperatures of approximately 600-700°C have been attained and work is continuing to further refine certain aspects of the stoves'

construction and the firing process.

Waste oil from both local service stations as well as E.D.D. (the Djibouti Electrical Company) was used as fuel and it was found that both worked equally well. A more precise temperature measurement system for the kiln is being ordered so as to better monitor the firing process.

Experiments have been begun with the firing of compressed earth bricks using the prototype waste oil stove. Initial results are encouraging and, if successful, fired earth bricks could become another viable means of using local materials for construction purposes.

(e) Wind Pumping

Wind speed and water output data are being collected on the 12 foot Aermotor windmill repaired by ISERST/VITA last year and now operating near Ali Sabieh. The data is being collected by Catholic Relief Services and indicates a good wind regime for water pumping in the area. Wind and water output data will continue to be collected at the site and will be reviewed with Wind Specialist Jon Hodgkin during his upcoming, second Djibouti consultancy next quarter.

(f) Energy Efficient Low Cost Housing

As a result of the interest generated by Architect Sy Jarmul's energy audit consultancy (see section 5. (a)), AID/Djibouti, REDSO/Nairobi and ISERST have agreed to the design and construction of between 5-10 low cost, energy-efficient housing units to demonstrate the principles outlined by Jarmul. These units will make maxumum use of local building materials and involve the participation of both Architects Jarmul and Dan Dunham. The Ministry of Travaux Publics has also expressed an interest to collaborate with ISERST/VITA on this subproject and a tentative division of responsibilities has been agreed upon with T.P. The ISERST/VITA budget for this subproject will be approximately $100,000 with Travaux Publics providing a half time coordinator, use of their laboratory facilities and various other in-kind services.

Interest in this subproject has also been expressed by the French Office of Technical Assistance (FAC). AID/RDO Ernie Popp, ISERST Counterpart Abdourahman and the COP met with the Director of FAC and were asked to share project results with the FAC as FAC intends to fund approximately 100 housing units to be built as part of the Djibouti

Urban Development Project.

During a recent World Bank team visit, three different groups of the team members contacted ISERST/VITA for information about prototype work being done with cinva ram bricks and waste oil heating under the Project. Site visits were arranged by the COP for all three groups as well as for a UNESCO consultant also interested in the subject.

3. Assessment and Dissemination of Research Results

(a) Distribution of Dan Dunham Architectural Design Manual

A total of 55 copies of the Dunham Architectural Design Manual have been distributed in Djibouti to public, private and international institutions and reactions to the manual have been very positive. REDSO/Nairobi Bob Adams reviewed the manual and requested 50 copies each of the French and English versions for distribution by AID to other East and Southern African countries.

(b) Solar Pump and Meteorological Assistance to Genie Rural

During the past year an increasingly close collaborative relationship has developed between ISERST/VITA and Genie Rural regarding solar and wind energy for water pumping. Most recently, Genie Rural has requested ISERST/VITA assistance in (1) sizing eight solar pumps they expect to purchase in the near future and (2) identifying and pricing certain specialized climatological equipment for agricultural purposes. VITA/Rosslyn is presently preparing the solar pump specifications and ISERST/VITA has given Genie Rural the climatological equipment information along with corresponding prices.

4. Energy Conservation Practices

(a) ISERST Renewable Energy Building (IREB) Construction

Construction of the IREB is well underway and almost all of the concrete work has been completed. A shrub nursery has been begun so as to have healthy plants and grass ready for the buildings' completion.

Despite the above, the building is approximately six weeks behind schedule due mainly to lack of materials, the replacement by Touzet of their site supervisor and local labor problems. The building is now expected to be finished on/about April 1, 1984. The contractor has been reminded that a late penalty clause exists in the contract and will be applied beginning on February 15, the date agreed to in the VITA/Touzet contract for the completion of the building.

As a result of the VITA analysis of the air-conditioning needs in the IREB the number of A/C units was reduced from 21 to 17. It was also found by the COP that Philco A/C units presently available in Djibouti are highly energy efficient and would be well suited for use in the IREB. Due to the higher price of the Philco units (compared to the Airwell units Touzet has expected to provide under the contract) Touzet refused to provide the Philco units without a considerable contract price increase. As a result, it was agreed with Touzet that the A/C section of the VITA/Touzet contract will be voided and that VITA will purchase the Philco units directly from the local Philco distributor. This will result in the IREB being equipped with the higher efficiency Philco units at a savings of approximately $2,000.

The Arco photovoltaic equipment (minus the batteries) arrived in Djibouti and has been stored in a temporary structure on the building site. Installation of the system is expected to begin o/a March 1, 1984.

Contract add-ons relating to the IREB electrical system have been agreed upon between VITA and Touzet totaling approximately $16,000. These add-ons are a result of design changes in the photovoltaic system as well as the use of high pressure, energy efficient, sodium vapor lamps for exterior lighting of the building and grounds.

Both the purchase of the Philco air conditioning units by VITA and the electrical add-on charges were approved by REDSO/Nairobi Construc-

tion Advisor Bob Adams during his November 6-9, 1983 site inspection visit.

Furniture for the IREB is presently enroute from the U.S. and will arrive in January.

5. Policy and Planning Recommendations to Government/Miscellaneous

(a) Sy Jarmul Energy Audit Consultancy

Architect Sy Jarmul completed a 6 week in-country energy audit consultancy during which he trained a Djiboutian energy audit team, audited 8 representative houses/offices in Djibouti, and presented the preliminary results of the team's work at a national energy seminar. The consultancy and seminar were done in collaboration with Travaux Publics, the GROD institution with the responsibility for establishing and enforcing national building standards. Travaux Publics provided a full time technician for the duration of Jarmul's consultancy who received energy audit training along with ISERST Technician Abdoulkarim and Counterpart Abdourahman.

The national energy seminar was attended by over 40 local government workers merchants and French technical assistants. Extensive T.V. and newspaper coverage of the seminar also took place.

Prior to his departure, Jarmul submitted an outline of his recommendations to the COP, AID and ISERST. His final report will be submitted to VITA/Rosslyn at the end of January for translation into French and forewarding to Djibouti.

As was mentioned under section 2. f, plans are underway to design and build 5-10 low cost energy efficient housing units that will incorporate the results and recommendations of the Jarmul consultancy.

(b) USAID/VITA Contract Revision

Discussions have been begun between USAID, ISERST and VITA to revise the USAID/VITA contract and project budget. Revisions have become necessary as a result of :

(1) expenditure of less money for the IREB than was planned;
(2) ISERST's need for financial assistance to bring water, electricity and telephone lines to the IREB;
(3) the need for more VITA home office support than was initially anticipated;
(4) the need for the project to finance a two-year expatriate technician;
(5) revised plans for prototype activities.

It is hoped that a general agreement between ISERST, AID and VITA will be reached on the revisions by the end of February and that a representative

from VITA/Rosslyn will come to Djibouti at the beginning of March to carry out final negotiations and sign the contract amendment.

(c) Expatriate Technician Replacement

Technician Rob Fraser finished a seven month consultancy on the Project during which time he :

(1) completed the training of 2 Djiboutians to handle basic maintenance on the climatronic meteorological equipment;
(2) installed monitoring equipment on the Aramadoule windmill;
(3) trained 3 Djiboutians on the installation, use and maintenance of a solar pump and organized three upcountry solar pump demonstrations;
(4) assisted in the construction of two waste oil stoves;
(5) supervised the ISERST/VITA office during the Chief of Party's R&R.

Rob was replaced by VITA Volunteer Steve McGoff on December 20. Steve is about to receive his technician degree in Alternative Energy from Redwing Technical School and, prior to coming to Djibouti, had spend 4½ years in Tunisia with Peace Corps and GTZ working on various types of water pumping projects. Steve is working as a volunteer in Djibouti until the end of February at which time a long term expatriate technician will be hired.

(d) Correspondence Course in Electronics for Counterpart Abdourahman

As part of the training component of the Project, a by-mail electronics course for Counterpart Abdourahman Farah Hassan has been arranged. When Abdourahman completes the course he will receive a Certificat de Capacité from the Institut France d'Electronique. Since the photovoltaics prototype work under the project will require a background in electronics it is felt that this course will be useful for Abdourahman and possibly the other project technicians at a later date.

(e) English Lessions for ISERST Renewable Energy Project Staff

Since many energy-related documents exist only in English, the ISERST Director has requested that Djiboutian Project personnel develop the ability to read and communicate effectively in English. As a result the Project Counterpart, 2 technicians and 2 meteorological

data analysts are presently taking English lessons financed under the Project. Counterpart Abdourahman and Technician Abdoulkarim are studying 3 hours per week (primarily in preparation for upcoming training programs in the U.S.) while Technician Nabil and Meteorological Analysts Moumina and Sabira are studying 1 hour a week. All lessons are given after work hours and have been arranged by The International Human Assistance Program (IHAP)/Centre de Formation Professionnelle et d'Assistance (CFPA) School which is also an AID/Djibouti-supported project.

(f) Driving Lessons for Counterpart Abdourahman and Technician Abdoulkarim

Due to the fact that none of the Djiboutian Project staff have drivers licenses and that this created logistical problems during the first year of the Project, driving lessons during non-work hours are being provided under the Project for Counterpart Abdourahman and Technician Abdoulkarim. In addition to increasing the mobility of key members of the Djiboutian staff, it is hoped that this will result in the Project not having to hire a full time driver as was initially planned.

(g) An end-of-year inventory list of equipment received by the Project from VITA/Rosslyn was prepared by Secretary Chantal Carpentier and has been submitted to ISERST for review and signature.

6. Private Sector Initiatives

(a) Firing Cinva Ram Bricks with Waste Oil

As a result of project support provided to Djiboutian businessman Abaneh Farah to promote the use of cinva ram bricks and to Syad Mahamoud of the Ministry of Commerce, Transport and Tourism with the use of waste oil for pottery firing, both men are discussing the establishment of a company to produce and sell waste-oil-fired bricks for building construction. Tests are still being conducted on both the bircks and the waste oil firing method but initial results look promising.

Information and by-mail technical advice on the firing of earth bricks is being received by ISERST/VITA regularly from VITA Volunteer Ali Sheriff in Tanzania.

(b) Arco Solar Corp. Representative Visit

Arco Solar Representative Jim Fanning paid a week-long visit to Djibouti and met with the COP, Genie Rural and Sotraco. As a result of these meetings Arco will provide a quote for eight solar pumps that Genie Rural intends to purchase in the near future. Also, Fanning is sending Sotraco preliminary information about becoming a local distributor for Arco photovoltaic products.

(c) Request from ONARS/UNHCR for Solar Pump Assistance

The National Organization for Assistance to Refugees and Poor People (ONARS), in collaboration with the UNHCR, has asked for help in sizing pricing and purchasing 2-3 solar pumps for agricultural use in Hol-Hol and As Eyla. Site visits are planned by ISERST/VITA staff early in the next quarter and Sotraco (see (b) above) has provided a price quotation for what it feels will be the appropriate Arco solar pump sets.

7. Problems and Issues

Financing of the Electricity, Water and Telephone Lines for the IREB

Two meetings between ISERST AID and VITA took place this past quarter to discuss the financing required for the installation of electricity water and telephone lines from the grid systems to the outer limits of the new ISERST building complex. Estimates indicate that $100 000 will be required to provide access to these utilities for the IREB. Since the utility companies have indicated that a four month lead time is required a decision should be reached in the near future between ISERST and AID on the financing of these installations if we are to avoid the problem of the building being ready for occupancy but without utilities.

Creation of an Energy Service within the Ministry of Industry

ISERST/VITA was recently informed that the GROD created a "Service d'Energie" within the Ministry of Industry last May. It has not been made clear yet what the role of this service is or how it should relate to our Project. At present, their staff consists of one person on, effectively, a part time basis. The COP met with this person on two occassions during the quarter and it is not clear to this person either how his service should relate to ISERST or the Energy Initiatives Project. The COP has raised this issue with ISERST Director Anis who is looking into the matter.

Lack of a Counterpart Institution to Assist with the Energy Assessment

Despite extensive efforts by the COP, Energy Analyst Tesse Ribot and Counterpart Abdourahman it has not been possible to identify a GROD institution willing and able to assist with the energy assessment. It had been hoped to identify 2-3 GROD economists who would work with ISERST/VITA on the implementation of the present energy assessment and thus develop the capability to repeat the assessment 1-3 years from now without outside assistance. This problem has been discussed with ISERST Director Anis Abdallah who feels that, in light of the lack of trained Djiboutian economists, it will be extremely difficult to find a GROD institution to assume this responsibility.

Employment of a Third Djiboutian Project Technician

According to the staffing plan agreed to by ISERST and VITA,

a third Djiboutian technician was to have been hired last month. A number of candidates were interviewed and one, an electrical technician now finishing his military service, was felt to be suitable. The technician is available to begin work on January 1, 1984 and is presently preparing the necessary documents to be considered by ISERST as a candidate for the position.

In light of the departure next month of Technician Abdoulkarim for 4½ months of training in the U.S., the hiring of a third project technician is becoming increasingly urgent.

8. Projections for the Sixth Project Quarter

- Arrival of Togolese Energy Specialist Dr. Messan L.L. Gnininvi for one week technical consultation.
- Completion of the field component of phase I of the Energy Assessment.
- Departure of Assessment Consultants Maxson and Ribot.
- Arrival of Energy Specialist Jon Hodgkin for one month.
- Installation of the IREB and Lycee photovoltaic systems.
- Receipt of the Sy Jarmul consultancy report.
- Purchase of solar pump for Obock School garden.
- Finalization of collaborative arrangments between T.P. and ISERST/VITA regarding the energy-efficient housing subproject.
- Computerization of ISERST/VITA's accounting system.
- Continuation of tests/modifications on the waste oil stove. Experimentation with the production of fired bricks.
- Receipt and storage of furniture ordered for the IREB.
- Consideration of a subproject to repair/refurbish one or more non-working windmills in the Obock region.
- Provision of solar pump information requested by Genie Rural.
- Assistance with the revision of the USAID/VITA contract and budget.
- Assistance with the hiring of a third ISERST project technician.
- Selection and hiring of a 2 year expatriate technician.
- Departure to VITA/Rosslyn and Gainesville, Florida of Technician Abdoulkarim

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