

PD-AAW-014
51496

THIRTEENTH QUARTERLY REPORT

October - December 1985

DJIBOUTI ENERGY INITIATIVES PROJECT

USAID Contract No. 603-0013-C-00-2001-00

Submitted to:

United States Agency for International Development

Djibouti

by

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Chief of Party

VOLUNTEERS IN TECHNICAL ASSISTANCE

Djibouti

January 1986

INTRODUCTION

This report covers the period from October 1985 until the end of December 1985. After the summer interlude, the revision of the project work plan following the 1984 evaluation, and the arrival and orientation of the new project personnel, the Energy Initiatives Project is now once again fully underway.

As discussed in the last quarterly report, the principal areas of project operation are now energy conservation, particularly in the housing sector; renewable energy technology, mainly for the pumping of water; and the institutional development of ISERST. The third quarter of 1985, however, has seen an increasing realization by ISERST and the Service de l'Énergie of the need for a comprehensive energy policy for Djibouti, and the formulation of a national energy plan. The Energy Initiatives Project has been asked to assist with this effort.

The format of the quarterly reports has been revised so as to better report on activities and initiatives related to the principal areas of project operation. Three initial sections will report on recent activities relating to energy conservation, renewable energy, and institutional development. These sections will be followed by a section on energy policy and planning; then sections describing other activities of more general interest, problems and issues that remain unresolved, and lastly a brief resume of activities intended to be undertaken during the next quarter.

ENERGY CONSERVATION

1. The publicity campaign intended to introduce Djibouti to the ideas of conserving energy is almost ready to commence. The TV spots have been outlined and scheduled, and the initial scripts have been drafted. The three world-class Djiboutian marathon runners have been pressed into service by their commanding officer, and will feature in the television media campaign as symbols of energy economy. They will also wear T-shirts depicting three runners in front of a sunrise emblazoned with the words: "development et maîtrise de l'énergie--Djibouti 1986". About 50 of these T-shirts will be distributed to the public.

2. The energy conservation team has been experimenting with different insulation techniques for domestic refrigerators. An apparatus has been constructed for the cutting of polystyrene board. This type of insulation has been applied to several household refrigerators operating in a variety of locations and in different environments. Preliminary results suggest that energy savings of about 20 per cent are possible.

3. The energy conservation team has been actively engaged in providing technical assistance to a number of Djiboutian agencies who have requested information and consulting services concerning the construction of new buildings. Besides the World Bank project at Salines West, the ISERST team has been consulted with respect to the new ISERST building, the new building for the LEP, and a large housing complex being built for the Djiboutian army. These activities are evidence that the energy conservation team is becoming increasingly well-known, and that the team is recognized as possessing a technical expertise previously lacking in Djibouti.

4. For instance, at the request of Travaux Publics, the energy conservation team has undertaken a detailed analysis of the proposed housing development for the Djiboutian National Army from the point of view of energy efficiency. It was recommended to Travaux Publics that several changes should be made to the designs in order to improve the thermal characteristics of the houses and the comfort of the occupants. These recommendations are under consideration by Travaux Publics.

5. Discussions have also begun with the Djibouti Urban Development Project (PDUD) in an effort to define areas of collaboration in a way that provides useful technical data and information for both projects. AID/Djibouti has set aside \$100,000 for such a collaborative effort. It is likely that the VITA Project, in collaboration with PDUD, will construct 3 or 4 state-of-the-art low cost houses in order to demonstrate a number of advanced features related, not only to energy conservation, but also to health and hygiene concerns, and the use of local building materials.

6. AID/Djibouti has agreed that architect Bernard Cazaban can be engaged by the project to supervise the construction of the new ISERST building. This energy-efficient government building will be a prototype of future building practice in Djibouti. The energy conserving features have been designed by the project team.

7. Discussions have been concluded with Vette Jurgensen, the Nairobi based architect who designed the main ISERST building, with regard to the changes necessitated by the inclusion of thermal insulation in the building design. In a series of meetings which included Bernard Cazaban and the Chinese building contractors, a number of important design revisions and modifications were agreed upon. After some initial hesitation, Travaux Public have accepted this arrangement, and have agreed to work with Mr. Cazaban and to help implement the energy efficient building practices promoted by the energy conservation team. This is especially welcome since the construction of the new ISERST building will therefore permit both Travaux Public and the Chinese building contractors to learn a great deal more about the installation of thermal insulation, and the design of energy efficient buildings in Djibouti.

RENEWABLE ENERGY

8. The cooperative agreement between the Ministry of Agriculture and Rural Development, (MADR), and the president of the agricultural cooperative at As Eylal, concerning the use of a solar pump provided by the project was finally signed at the end of October. Although the principal agreement is between MADR and the agricultural cooperative, ISERST in the form of the project renewable energy team is responsible for the repair of the pump, and for the provision of spare parts if the cooperative at any time lacks the funds to purchase the necessary items. This agreement remains in effect until the end of 1986.

9. The renewable energy team went out to As Eylal in early October with the intention of formally handing over a 300 Watt SEI solar pump to the agricultural cooperative. However, the day before the small ceremony was due to take place, it was discovered that the pump was not working. An examination of the system revealed that there was a problem with the electrical system. The pump was returned to the ISERST workshop where it was repaired a few days later. The problem appeared to have been caused by someone meddling with the system wiring.

10. While out at As Eylal the team also checked the installation and operation of the solar pump installed by the Office National d'Assistance aux Refugies et Sinistres (ONARS). During this same trip, the Climatronics unit at Dikhil was dismantled and returned to Djibouti where it has been set up on the roof of the renewable energy building.

11. The renewable energy team later returned to As Eylal to replace the photovoltaic pump which had been removed in October for repair. However, the well being used by this pump is still not completely finished so the pump has not yet been permanently installed. The team once again checked the Telefunken pump installed by ONARS just outside As Eylal. This pump is working well and is being used to irrigate a small garden which produces food for refugees.

12. The renewable energy team has completed the installation of a photovoltaic pump in Obock. This work was completed by ISERST technicians without the direct supervision of expatriate staff. The installation was accomplished without difficulty, and is evidence of the increasing expertise and technical capability of the Djiboutian technicians working with the project.

13. A Climatronics meteorological sensing unit has been installed on the roof of the renewable energy building. This was the unit which was previously operating in Dikhil. The apparatus will be used to collect meteorological data, and to train technicians in the operation and maintenance of these units. The Direction de l'Aviation Civile et de la Meteorologie (DACM), which has expressed an interest in operating the remaining Climatronics units which are installed in the interior of

the country, has indicated that it would be willing to assign two technicians to the supervision and maintenance of these units. These technicians will be trained at ISERST using the Climatronics unit now operating on the roof.

14. The photovoltaic pump testing system is now operational. The tower was erected in late October, and the piping system, including a pressure gauge and flowmeter, is now finished. The test system will permit photovoltaic pumps to be tested in a manner similar to the procedure used by the World Bank technical team which recently assessed the technical feasibility of solar water pumps. A test manual has been prepared and ISERST technicians are learning the test procedures so that when the TED pumps arrive from AFME the technicians will be well versed in the test procedures. ISERST technicians have practiced the test procedures using the 400 Watt SEI pump, and a short report has been written presenting the performance characteristics of this photovoltaic pump.

15. Mr. Hubert Bonneviot from Total Energy Development (TED) visited Djibouti in the middle of November. TED is the company which will manufacture the photovoltaic pumps which are to be provided to the project by AFME. During his brief visit to Djibouti, Mr Bonneviot travelled out to As Ela with Mr. Mairey from Genie Rural and Abdourahman Nour, the Project's senior renewable energy technician, in order to see the photovoltaic pump recently installed by the ISERST renewable energy team. The 4 TED photovoltaic pumps are still expected to arrive from France within the next few weeks, although previous delays with this equipment suggest that this estimated delivery date is by no means certain.

16. The renewable energy team made two trips to Ali Adde to help the French Volontaires du Progres, (AFVP), repair and operate a small wind pump which they had just installed. The ISERST team made some changes to the pump position and operation, and the unit is now operating satisfactorily.

17. The VITA COP and senior technician Abdourahman Nour travelled down to Hol-Hol with Dr. Louis, the chief of the Service d'Hygiene, and Immy Niebor, a technical advisor with WHO, to take a look at the rural dispensary, and to consider the possibility of installing a medical refrigerator for the storage of vaccines. The proposed technical design is based on the use of a 12 volt refrigerator of the type normally powered by photovoltaic panels. In the case of Hol-Hol however, which has about 10 hours of apparently dependable electricity each night, the solar panels become redundant since the refrigerator batteries can be recharged each night using a conventional battery charger. This novel design reduces the cost of the system by about 80 percent. The prototype system also includes lights for three consulting and examination rooms in the clinic.

INSTITUTIONAL DEVELOPMENT

18. AID/Djibouti has agreed to the training of Abdulkarim Nader in information processing and library science at an institute in the United States. After his return from the U.S., Abdulkarim Nader will work with the small library in the Renewable Energy Building until the main library and documentation centre in the new ISERST building, now under construction, is ready for operation.

19. AID/Djibouti agreed to purchase a fourth vehicle for the project. The level of program activity at the present time is such that the availability of an additional vehicle has become essential. A Toyota Landcruiser pickup truck has been purchased and is now being used by the energy conservation team.

20. Instructors at the Lycee d'Enseignement Professionel, (LEP), have agreed to help organize a number of training programs in electronics and electrical engineering for ISERST technicians. These courses will run for a few hours each week at the LEP. A curriculum has been outlined and agreed upon and classes should commence in the near future. The LEP instructors are also familiarizing themselves with project activities in renewable energy and energy conservation, and with the operation and maintenance of the various renewable energy systems operating at the Renewable Energy Building.

21. The Minister of Industry has agreed that Oblik Carton, the head of the Service de l'Energie, will be available to work on a regular basis with the Energy Initiatives Project. One of Mr. Carton's first tasks will be to help coordinate the organization of the Energy Assessment seminar planned for February 15 - 20, 1986. He will also be a key member of the National Energy Commission which should commence its work in early March this year.

22. Senior technician Abdourahman Nour has successfully completed his probationary period and is now officially employed by ISERST as head of the project's renewable energy team. Another senior technician, Ibrahim Mohamed, commenced a probationary period on December 15th. These additions to project staff bring the renewable energy team up to 4 persons, including Steve McGoff, and the energy conservation team up to 3 persons, including Jean-Yves Garnier. The energy conservation team will be strengthened within the next few weeks by the addition of two technicians from the Ministry of Industry. AID /Djibouti has agreed that the project may pay for, and train, these technicians for a year; they will then work for the Ministry of Industry in the Service de l'Energie.

ENERGY POLICY AND PLANNING

23. AID/Djibouti has agreed to an ISERST proposal for the organization of a conference of international donors in November 1986. This conference will follow several months of analysis and study of the energy sector in Djibouti conducted by a joint team of Djiboutian experts, and a foreign team of energy specialists. The Service de l'Energie will be working closely with ISERST and VITA project personnel assisting with this task. AID/Djibouti has earmarked up to \$200,000 for this effort--an amount which will be primarily under the control of ISERST. VITA/Roslyn has been asked to help locate and organize the international team of energy experts which will assist the Government of Djibouti to assess present and future energy needs, to formulate a National Energy Plan, and to identify and design priority energy development and management projects.

24. The planning effort leading up to the conference of donors will commence with the organization of the seminar presenting the results of the 1984 National Energy Assessment. This seminar will take place in February 1986. The Service de l'Energie, ISERST, and the VITA Project team are now working on the preparations for this seminar. Matt Milukas, who was a member of the consulting team which prepared the Assessment, will come to Djibouti to assist with the presentation of the recommendations set out in the Assessment report. As far as possible, the other agencies and services of the Government of Djibouti will collaborate in the organization of the seminar, and the presentation and discussion of the recommendations. Both Electricite de Djibouti and Travaux Publics have expressed an interest in actively participating. The Service de Planification has also indicated that it is willing to collaborate in this effort. A National Energy Commission will be organized immediately after the February seminar. This commission will direct the analytical and planning work leading to the formulation of the National Energy Plan, and the design of the priority energy projects.

25. A budget has been prepared for 1986 by the Project COP. Approximately \$260,000 should be available for program activities in Djibouti during the coming year. Of this sum, approximately 66 percent will go towards energy conservation, 6 percent towards renewable energy technology, and 25 percent is to be spent on training; the remainder is set aside for purchases of workshop equipment and bibliographic material. The apparent lack of emphasis on renewable energy technology reflected in these budgetary figures is mainly due to the fact that a substantial amount of photovoltaic equipment is being provided free of charge by the French government, and is therefore not included in the project budget.

OTHER RELATED ACTIVITIES

26. The Apple IIE computer has been used to prepare tabulated meteorological data collected by the Climatronics units over the last two years. Using the Visicalc spreadsheet program, the ISERST programmer has produced tables of average monthly temperatures, windspeeds, and insolation levels measured at each of seven sites in Djibouti. However, doubts have been raised about the accuracy of the data since at least one set of measurements has been found to be seriously in error. Efforts will be made to verify the accuracy of the meteorological data, and to correct those that appear to be in error.

27. The computer has also been used to prepare accounting summaries of project field expenses. Besides saving time for the project administrative assistant, this exercise is useful training for the project's computer programmer since computer programming at ISERST is likely to become increasingly widespread in the future as the institute moves more and more to computer based systems of operation.

28. Jim Fanning, the Arco Solar dealer for East Africa, passed through Djibouti on his way to Somalia. While in Djibouti Mr. Fanning discussed the possibility of future prototype development work with photovoltaic systems. It was pointed out to Mr. Fanning that there seemed little need to purchase PV pumps at the present time since ISERST was expecting 4 pumps to be delivered within the next few weeks, and Genie Rural was expecting another 10 pumps to arrive from France during 1986--pumps which would be tested at ISERST and monitored in the field by project personnel. This level of effort was felt to be more than sufficient given the limited resources of the renewable energy team. However, an interest was expressed in solar powered medical cold storage systems for rural dispensaries and clinics, and Mr. Fanning has been invited to submit a proposal for such a system.

29. U.S. Ambassador John Ferriter visited the Renewable Energy Building at the end of October. He was shown around the building by Anis Abdallah and Abdourahman Farah from ISERST, and Jon Lundgren from the USAID office. Mr. Ferriter was shown the building photovoltaic system on the roof, and a photovoltaic pump was also set up and demonstrated. Mr. Ferriter appeared to be favorably impressed by the project, and expressed his hope that the energy sector initiatives being pursued by ISERST would continue after 1986 with direct funding from USAID.

30. Former Chief of Party, Steven Hirsch, visited Djibouti for 14 days at the beginning of October, 1985. This provided an opportunity for a general discussion of the 1985/1986 work plan, and for many useful discussions concerning the general direction of the project and the organization of project personnel. Steven Hirsch also introduced the present COP to many local people working in fields related to energy supply and demand, and working in agencies and organizations which were involved with the first phase of the Energy Initiatives Project.

PROBLEMS AND ISSUES

31. The 3 kW NOVA inverter used with the building PV system has failed after operating for less than six months. It is not clear what caused this problem. The unit has been replaced with the other NOVA inverter and this unit is operating satisfactorily. However, questions have been raised concerning the utility of possessing two identical inverters which can not be operated in parallel on the same circuit. The 3 kW inverter now in use is unable to cope with the transient power surges caused by the operation of the small refrigerator compressor which is part of the load circuit. These concerns have been brought to the attention of ARCO Solar Inc. and they have agreed to replace the small inverters with a single 5 kW unit.

32. There is evidence of termites in the new Renewable Energy Building. An examination of part of an inside wall in the workshop by architect Bernard Cazaban indicates that the termites are attacking the paper pasted over the plaster board (and not the glue as first thought). No solution has yet been found for this problem. It is assumed that in a few years time the interior paint and the paper sheeting will have to be stripped off, the termites will be sprayed, and then paint will be reapplied directly onto the plaster board without first using any paper over the board.

NEXT QUARTER ACTIVITIES

33. The four TED photovoltaic pumps should arrive from France. The pumps will be tested at ISERST by project technicians. An engineer from TED will arrive shortly after the pumps are received by ISERST and will present a short training course on photovoltaic principles and practise, and on water pumping technology.

34. Efforts will continue to get the windmills in the north of the country back into service. Discussions will continue with Genie Rural, the Service de l'Agriculture, and the Districts to try and find a way to ensure that the wind systems are, in future, properly maintained and operated.

35. A number of Djiboutian technicians will be sent to France for training in energy conservation principles and practice. The group will include two technicians from the project energy conservation team, two technicians from the Service de l'Energie, and one or two technicians from other Djiboutian agencies who have expressed an interest in energy conservation, and who are willing to provide technicians to ISERST to participate in the energy conservation work which is now in progress.

36. A seminar presenting the results and recommendations of the National Energy Assessment will be organized in February 1986. Matt Milukas will assist with the presentation of the recommendations, and with the discussion of the technical and economic background of the study.

37. Following the seminar, a National Energy Commission will be set up. This commission will be expected to formulate a National Energy Plan for Djibouti. VITA project personnel have been asked to assist with this effort in collaboration with ISERST, the Service de l'Energie, and the other Djiboutian services and agencies who will be working with the commission.

38. The energy conservation media campaign will commence. This campaign on the radio, television and in the press, will run for several months in early 1986. A media specialist from AFME in Paris has been invited to come to Djibouti to advise the project team, and to assist local media personnel with the organization of this activity.

39. A 12 volt prototype medical refrigerator and lights will be purchased by the project and tested by ISERST technicians. It is planned to install this system at the medical clinic at Hol-Hol which cannot operate effectively at the present time because of intermittent electrical supply.

40. In collaboration with the LEP, technical training courses will be organized for ISERST technicians, and for technicians from other services and agencies interested in taking part.

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