

EVALUATION OF PHASE IMorocco Project 608-0159  
Renewable Energy Development

November 11, 1981

Revised March 15, 1982

A. Background

The project was approved on December 14, 1979 and was intended to contain upon conception, a number of separate inputs : a \$600,000 grant by AID for design and planning of programs and an institute under Phase I of the program, a \$4.4 million combined investment by AID and the Government of Morocco (GOM) through its Ministry of Energy and Mines (MEM) for further development of programs and the construction of a research institute by the GOM under Phase II of the program.

Taken from the logical framework of the Phase I Project Paper, the goals of this project were as follows :

1. Feasibility studies and preliminary designs for
  - a) research laboratory and Center for Renewable Energy
  - b) 3 micro-hydro generation and distribution facilities
  - c) wind or sun-powered irrigation pumping stations
  - d) 5 Moroccan professionals trained in renewable energy in the U.S.

Conditions that will indicate purpose has been achieved. End of project status (Phase I).

1. Feasibility study reports for the renewable energy facility and for the three companion tests and demonstration subprojects in hand at MEM.
2. Preliminary designs and cost estimates for the four facilities increments in hand at MEM (Laboratories and three micro-hydro centers).
3. Functions and objectives of renewable energy institute are formulated.

4. Renewable energy advisor at work with the MEM.
5. Five Moroccan professionals trained in the U.S. in renewable energy and at work in the new CDER or MEM.
6. A Phase II grant Project Paper in hand at USAID/Rabat.

The Project Identification Document (PID) completed in 1979 projected the Renewable Energy Program to begin the spring of 1980. In Washington, D.C., conflicting theories arose among internal components of AID/W, concerning the execution and maintenance of the overall project, thus creating adverse relationships regarding the project. Among the internal agencies of AID, the Near East Bureau's Project Development Office in Washington, D.C., wrote, edited and authorized a Phase I Project Paper for implementation in Morocco.

This may be seen by examining a series of letters quoted in the following Project Chronology.

Project Chronology

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|--|--------------|
| - The PID recommending Renewable Energy Project (0159)   | Nov/Dec 1978 |
| - P.P. drafted and reviewed in AID/W receives overall support of "wholesaling the project to one firm", suggests further review of implementation section of P.P. by USAID and AID/W.  | Nov 1979     |
| - Allocation of : 2 million dirhams to the project by the MEM.<br>: Director for the "Center for renewable energies" appointed.<br>: Program Officer cautions that in order for the CDER to be autonomous a dahir (decree) must be published in the "Bulletin Officiel", which could take years.   | Nov 1979     |
| - Decision that appropriate course of action is to contract with one I.Q.C. firm for all services (Center, Program, Micro-hydro, wind-solar ).   | Jan 1980     |
| - Approval of the P.P. by NEAC.  | Feb 1980     |
| - NE/PD is advised by NE/TECH, inspite of whose preference for a single organization, to provide the necessary linkages, recommends that proposals be sought from three other energy I.Q.C. firms for the section concerning the Center and its coordination. "The Mission Director stated Monday that expertise in renewable energy was far more important than having a single entity handle Phase I". | March 1980   |

- C.T. Main is requested by AID/W to draw up proposal for the Phase I activities of the Renewable Energy Program. Jan/Feb 1980
- Main's first proposal. Feb 1980
- Main's second proposal. March 1980
- Main's third proposal. March 1980
- Program Officer states other than in the area of small hydro the C.T. Main proposal still "seems thin". April 1980
- AID energy policy options paper. April 1980  
Mission Director talks about fighting over turf.
- Signing of the Phase I Program Agreement by Ambassador Duke and Minister Moussa Saadi. April 1980
- C.T. Main begins work in Morocco. June 1980
- Minister Moussa Saadi pushes for two showpieces by 1981 : Sept 1980
  - 1) the completion of small hydro centers
  - 2) the construction of the Renewable Energy Development Center in Marrakech.
- USAID Program Officer asks that C.T. Main be encouraged through AID/W to produce working documents for the GCM/USAID for the completion of projects. Sept 1980
- Main asked for Contract Amendment to Scope of Work. Oct 1980
- Mission Director cables to acting Assistant Administrator/NE ... "We are deeply disturbed by the fact that NE/PD is capable of such judgement as to (a) assert that responsible management of all phase II activities be provided and coordinated by a "single broadly skilled U.S. firm".
- Final Report of Main to USAID. Nov 1980
- Program Officer notifies AID that C.T. Main did not alert anyone within AID of cost overruns on the project. Dec 1980  
If they did, he would have redirected the work allocations to concentrate on the design of the research center in Marrakech.

- Program Economist writes to Program Officer advocating research in the area of : charcoal conversion and solar projects. He comments that the "Meso-Hydro" portions of the C.T. Main report do not hold much promise of economic and financial viability but, "to keep from getting egg on our face and show goodwill" build a hydro-electric plant at a selected site. Dec 1980
- Separate evaluation by Personal Services Contractor. Evaluating C.T.Main's performance is very critical of work produced by the contractor. Jan 1981
- Contractor Performance Evaluation Report by Mark Ward. Jan 1981  
C.T. Main's work was to have formed a basis for :
  1. Project Paper.
  2. Final Center Design and Pilot Projects.
  3. Action plan for the GOM with AID support. Feb 1981

"The contractor's report was adequate for none of these purposes".

"Redesign to make up for Main's shortcomings will cost an estimated \$100,000." ..

"A small hydro expert provided by NRECA under an AID contract was therefore used to design pilot installations which will cost about one fifth as much as those proposed by Main and will consequently be much more likely to be replicable in the Moroccan context. The cost of NRECA was \$14,000."

"USAID recommends that this firm's qualifications be reviewed in the field of renewable energy development and that their I.Q.C. in that area be terminated."
- C.T.Main INC. was selected by AID to carry out all Phase I work on the renewable energy program. This engineering firm was later found incompetent to complete the work it started due to lack of personnel skilled in the areas of the overall program. The AID had advised against this approach as too simplistic for the design of an experimental project. Feb 1981

In short, USAID played a minor role in the initial stages of the project, since NE/PD let the contract for one U.S. based firm to cover all of Phase I activities. Initial activities of the project were carried out despite documented opposition by USAID. Specifically, a project conceived initially to help establish a Moroccan research and development institute for renewable energies and only secondarily to install a few demonstration projects was turned around by AID/W to become a project seeking a positive

cash flow from installations, which even under the most favorable U.S. conditions remain largely experimental and hardly cost competitive. AID/W insistence to prove its point - that the project must be a financially viable commercial investment disregarded field and host country advice, not to mention the views of the very scientists first sent to the USAID to help design the PID.

This AID/W-inspired change in project objectives caused several hundred thousand dollars of central funds to be spent on C.T. Main design efforts which have generated reports of dubious utility. USAID must now conclude that its initial conception of the project was valid and that in the future it should resist more vigorously overly ambitious, premature project goals imposed by AID/W. However, logistic support was given to the project designers by USAID. Numerous letters of protest were written to appropriate agencies in Washington, D.C., concerning the project and its implementation before its initiation in Morocco by the host country Mission Director and staff.

A second attempt was made to design the research institute in Marrakech, when AID again contracted this part of the project to Claudill, Rowlett & Scott (CRS). Due to ineffective coordination with the Moroccan counterpart staff at the Ministry of Energy and Mines, the CRS architectural study was largely rejected by the MEM. The MEM's reason concerning the rejection of the architectural study of CRS was the lack of forethought and planning before undertaking the task on the part of AID.

Each time a study has taken place the individuals and firms involved have had to retrace steps taken by those before. This can be seen beginning with the PID, C.T. Main, Caudill, Rowlett and Scott, SERI, and finally those yet to come. Each has come to Morocco, asked the GOM for similar types if not the same initial base literature, fulfilled the obligations of their contracts, and left without providing USAID or the GOM with enough information to materialize, salvage or even visualize a substantive project.

This is what USAID had tried to avoid in the beginning through its letters of protest prior to the implementation of the project in Morocco. Phase I activities have been an ongoing operation and some have exceeded their estimated budgets and time limitations. The Project Paper does include a section for evaluation, however, at this time much of the criteria pointed out in the Project Paper may not be applied for lack of pertinent data.

#### Phase I

At the signing of the Grant Agreement of Phase I, the total project was planned to be completed within fiscal year 1982.

### Recommendations

- (1) Coordinate time schedules between the AID and the MEM on at least a monthly basis.
- (2) Include more technical advising in the planned execution of studies concerning this project.
- (3) Develop a list of anticipated technical assistance needs for the completion of this project.
- (4) Develop an evaluation criteria showing more verifiable indicators. (i.e. an economic analysis may not be carried out at this time for lack of information).
- (5) AID/W offices should follow more closely the advice and suggestions of USAID to avoid a reoccurrence of inadequate contracting.

### Evaluation Methodology

The evaluation of Phase I of the "Renewable Energy Development" project was undertaken with the following purposes in mind :

- A. Evaluation is a part of this program's design. The Project Paper states page 24, Section 5.01., that a review and evaluation of the project would be executed while preparing the Project Paper for Phase II. The Project Agreement states page 4, 5.1., that periodic evaluations would be executed to examine the extent to which Phase I had achieved its objectives. Both documents explain that evaluations would be carried out "together" (AID/MEM). To date there has been no evaluation of Phase I of the renewable energy project, by either party as agreed upon in the beginning.
- B. The overall project, its component parts, and the commitment to improve living standards, increase energy production through utilization of Morocco's renewable energy resources, (as stated in the logical framework) are priorities adopted by the Ministry of Energy and Mines which USAID wishes to continue to support. Phase I of the project is now being followed by Phase II; however, the experience gained from the studies, programs, and designs of Phase I, should prove valuable to the current and future workings of Phase II.
- C. This evaluation along with documents which came out of Phase I of the project (i.e. C.T.Main proposals and studies, PP's, PIL's, Personal Service Contractor's evaluation of the CDER

building in Marrakech) are intended to be tools for planning and further evaluation of the project. This evaluation is intended to be of use to AID and MEM to help in their refinement of Phase II together as originally intended by the Project Agreement and Project Proposal.

- D. The evaluation was designed to verify if goals are still relevant and, if so, are still being adhered to, and to make recommendations for more expeditious implementation of project goals. The evaluation is based on a review of the files of the Office for Technical Projects (USAID), interviews with those involved in the project at USAID and interviews with those involved in the project at the MEM/Rabat and CDER representatives.

A list of people who provided information is attached.

#### External Factors

Many external factors are relevant to the performance of the project in its first phase; below are some of those which might further help the reader to better understand the project.

##### 1. Imbalanced Sharing of Project Costs

First of all, of the original allotment of \$600,000 to Phase I of the project, AID and the MEM were working exclusively with AID monies, with the exception of those funds expended by the GOM to pay the salaries of its workers. Since that time, phase II has tapped the GOM monies, thus increasing the role and responsibility of the MEM. The advantage of this is a foreseeable improvement in the leadership role by the MEM, once financing by the GOM gets underway.

##### 2. Weak Logistic Support

A second external factor which has during Phase I of the project influenced its slow progress, had been unavailable materials within the office of the MEM. Secretarial services, xeroxing and back up services have been a minimum in their office sometimes leaving gaps of time which might have been productive if these services were available, while logistic support has been over extended on the part of USAID. Contractors have invariably reported for work in Morocco misinterpreting their basic assignment for work in Morocco. This has put an excessive demand on the USAID to cater to contractors' requirements. Although this might seem of little relative value to the project, it has tied up a significant amount of time, and merits improvement to expedite the progress of the project.

3. Institutional Newness

The third external factor deals with the administration of the MEM and bureaucratic delays. The "Center for the Development of Renewable Energies" will be a new para-statal institution dependant upon the Ministry of Energy and Mines. Normally, the translation of work between the GOM Ministries and AID entails a certain number of seemingly inevitable setbacks due to bureaucratic delays. Since renewable energy projects are new to Morocco, and there is also a new para-statal organization to manage them, an even higher incidence of bureaucratic delay can be expected to result from such a first time effort.

One must note that this area is not only new to the MEM, but it is also new for AID.

Although "typical administrative and bureaucratic delays" are a part of this program, and can justify some of its setbacks, it should be recognized that both Project Paper and Project Agreement were overly optimistic in their scheduling.

4. Establishing the Autonomy of CDER

A fourth external factor which relates closely to the first is that with the establishment of a Center for the Development of Renewable Energies another administration has been created having to depend on the first, that being the MEM. The Center for the Development of Renewable Energies is now at the time of this report starting to gain its autonomy from the "Division for the Development of Energy Resources" (DDRE). The DDRE is a part of the MEM which before contained CDER and its component projects. With the separation of CDER from DDRE, CDER will have its own budget and staff. Although it has taken time to create the staff and anticipate the needs of CDER, the complete transition will take time. This merits the anticipation of slow progress until the transition of CDER from DDRE is complete.

5. Better Coordination in Project Planning

The fifth and final external factor concerns USAID's relationship with the MEM, the DDRE, and the CDER. Past project delays have been viewed by the Moroccan counterparts as misjudgements by USAID, regarding the element of time it takes the GOM to take action on any project. This factor has been an indicator of the need for AID/W to work more closely with the Rabat Mission.

The Phase I Project Paper and contract prepared by AID/W have repeatedly failed to predict working conditions in Morocco. AID/W might be more sensitive to working conditions in the host country.

In the planning process of the project the feeling has been that USAID did not do enough consulting with the MEM before actions were taken. This left a lag period between the time consultants came from the U.S. to accomplish a certain task and preparatory time to assemble necessary information to make the task easier and expedite the work of the consultants. The result of this delay was usually frustration on the part of all parties involved and the task inevitably fell short of its aims and goals. Better communications, and a greater degree of planning with the MEM has been stressed by the Moroccan counterparts as a solution to this problem.

#### Inputs \*

Inputs into this program were projected in the Project Paper to be \$600,000 in grant monies from AID for Phase I of the project. The breakdown and actual cost figures of USAID to November 12, 1981 were as follows :

1. Training original allotment \$50,000

This sum was obligated to the training of five engineering students in the U.S. for 16 man-months, the training of the Director of the CDER and his Secretary General in the U.S. for an undetermined period of time. All these people at the end of their training period are to compose part of the working staff of CDER. Overruns of original allotments have been taken into Phase II funding of the project.

Actual expenditure \$5,338.76 broken down as follows :

(1) 2 engineers at "Stony Brook" for a course in "energy management for developing countries"	\$	202.00
(2) 4 engineers training in renewable energy courses in Florida	\$	4,000.00
(3) Preparation for Director and Assistant Director of CDER for training in the U.S.	\$	700.00
(4) English lessons at the "American Language Center for engineers, and other staff	\$	436.76

(A) Original allotment	\$ 50,000.00
(B) Obligations to 11/12/81	\$ 29,949.00
(C) Expenditures to 11/12/81	\$ 5,338.79
(D) Unliquidated balance 11/12/81	<u>\$ 24,611.24</u>

Training is now underway in the U.S. for the remaining 4 engineers, originally planned to begin in March of 1980 and end in June of 1980. It did not begin until September 1981 and will end January 1982.

2. Feasibility study and preliminary design of 3 small hydro systems for 8 man-months.

Actual expenditure \$158,587.22

Original allotment \$ 100,000

(1) Charles T. Main study	\$140,000.00
(2) P.O. No. 81-028 (Mr. Baghdadi)	\$ 3,922.33
(3) Contract (AB Hammoudi)	\$ 11,991.83
(4) PBC Maghreb/INCOMAG	\$ 2,673.08

: all were studies carried out for the 3 hydro sites.

(A) Original allotment	\$100,000.00
(B) Obligations to 11/12/81	\$194,914.22
(C) Expenditures to 11/12/81	\$158,587.22
(D) Unliquidated balance 11/12/81	<u>\$ 36,327.00</u>

These studies were planned to have begun by June 1980 and to have ended by January 1981.

Finished in November 1981.

3. The Center for the Development of Renewable Energies, Marrakech  
CDER 9 man-months

\$110,000.00

Several designs were executed for the schematic and preliminary studies of this Center.

Actual expenditures	\$142,969.32
1) Charles T.Main	\$130,000.00
2) S.Davenport	\$ 1,000.00
3) Rory Turner	\$ 8,129.00
4) John M. Powell	\$ 3,840.00

One should emphasize that ST/EY also supported the CDER building design with \$96,000 in technical assistance. This project had been planned to begin in June 1980 and planned to end by January 1981. The basic design work was concluded in July 1981.

(A) Original allotment	\$110,000.00
(B) Obligations to 11/12/81	\$142,969.32
(C) Expenditures to 11/12/81	\$142,969.00
(D) Unliquidated balance	0

The design of the Center is now in the hands of the Moroccan Architectural Firm of Mr. Idrissi Alaoui Sherif. It is due to be further modified with construction to start in the spring of 1982.

4. Wind/solar irrigation pumping stations, study and preliminary design, 9 man-months :

(A) Original allotment	\$110,000.00
(B) Obligations to 11/12/81	\$ 80,000.00
(C) Actual expenditures	\$ 80,000.00
(D) Unliquidated Balance 11/12/81	\$ 30,000.00
(E) Charles T.Main study	\$ 80,000.00

Wind/solar irrigation pumping stations is a project which is now pending and may be subject to redesign.

5. U.S. short termed advising service. 12.5 man-months

Original allotment	<u>\$150,000.00</u>
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These services have yet to be taken advantage of. They had planned to begin June 1980 and end January 1981.

6. Contingency/escalation of prices

Original allotment      \$ 35,000.00

7. Contingency/unplanned costs

Original allotment      \$ 45,000.00

Numbers six and seven are general allocations which have not yet been tapped. No specific use has been applied to these two categories other than their general headings.

As of 11/12/81, the overall expenditures of the project have totaled \$579,588.17  
the obligations total \$494,000.00  
Unliquidated balance is \$1,490,687.03

NOTE : Overruns of original allotments have been taken into Phase II funding of the Project.

Although the initial AID inputs have fallen short of their projected goals, the only short coming of the program thus far has been failure by the program planners at the outset to anticipate the pace at which the program was to progress. The Charles T. Main studies have been used for the execution of every study since its termination. As a base study for factual data, the reports resulting from the studies have proved time-saving for the entire project and its subprojects. The input absent was the use of more technicians knowledgeable in working in coordination with the MEM and AID in addition to being knowledgeable in technical fields of this project.

Outputs

Project outputs were to include, as developed in the first Project Paper :

1. Training five MEM professionals in the U.S., 16 man-months.
2. Feasibility study and preliminary design, three small hydro systems, 8 man-months.

3. Feasibility study and preliminary design, research laboratory and facility at Marrakech, 9 man-months.
4. Feasibility study and preliminary design, wind or sun-powered irrigation pumping stations, 9 man-months.
5. U.S. short-term advisory service 12.5 man-months.

As mentioned in the previous section, the projects time schedule has been misjudged, none of the projects have yet to terminate fully.

The primary reasons for non-completion of the project have been :

1. Inappropriate material, back up and administrative/bureaucratic delays of the MEM's staff.
2. Inexperience in executing a project of this nature in Morocco.
3. Communication, coordination failures between the MEM and AID.
4. No monitoring studies done of this project prior to this report; especially of the type planned for in the Project Paper and Project Agreement.
5. Change in staffing at both the MEM and AID.
6. Insufficient USAID staff to monitor contractor activity.
7. Failure of AID to react to initial opposition to the project by the USAID Mission Director and staff.
8. Insistence on AID's part to contract for all design services with one firm led to the selected firm trying to provide unfamiliar services. The USAID then felt compelled to re-do or verify the work.

However, many if not all of the outputs have been necessary steps for the development of the project. With the passing of the law providing for the existence of CDER and its inclusion in the new 5-year plan, more progress should be seen evolving from its staff. The change of staff at the USAID was a transition element which slowed the progress of the project, for it has taken time for them to orient themselves to the work and all of its components. Evaluation is an important part

of this project. It should be carried out although some of the criteria, especially those related to financial soundness need revision. The Project Paper lists the following criteria for subproject soundness :

1. All pertinent technical aspects have been included in the analysis and each is positive and verifiable.
2. Conformity to accepted engineering standards and practices.

Financially sound if :

1. Resulting estimated revenues sufficient to amortize the investment.
2. Cover fixed charges, maintenance, administration, operating cost and provide return on investment.

Sociologically sound if :

1. Inequitable burdens (financial) are not placed on consumer.
2. Consumer can learn maintenance/operation of facility.
3. Community agrees to the subproject.

Environmentally sound if :

1. No adverse environmental effects are projected, or
2. Adverse environmental effects are offset by anticipated benefits, or
3. Amelioration of the environment is expected.

The project is an institution building and experimental effort in renewable energy technologies. As such, it should not be required that the Center itself, nor the individual pilot projects, be necessarily self-amortizing. However, it is expected that the technologies selected for pilot project investment offer a reasonable promise, on the basis of prefeasibility studies, of being socially acceptable, environmentally suitable, and economically sound in Morocco. Close monitoring of social, environmental and economic impact of the pilot project is a principle role of the Center. Costs, benefits, energy use, and side effects, both intended and unintended, need to be tracked and recorded. After a suitable "settling down" period for the pilot projects,

each one needs to be evaluated on social, environmental, economic, and financial grounds to assess the cost and benefits of extension of given technologies. If a given pilot project, for example micro-hydro is financially and economically positive, this needs to be known. If not, the cost of the subsidy and the cost effectiveness of different solutions, needs to be known before extensive programs are undertaken.

The intent of Phase I and Phase II is to produce a base for economic, financial and social analysis upon which the GOM can make its investment decisions. Consequently, as an experimental effort, Project 608-0159 is not required to be a self-replicating, profit-generating investment.

The project is making progress and valuable experience is being gained through working on it. The program and its components are an experimental attempt to exploit renewable resource with respect to energy in Morocco. In the framework of experimentation, much of the ground work will be of negligible value in evaluation, since one of experimentation's purposes is to generate useful information; which, in turn, would be helpful in planning further extensions.

Drafted by:OTP:RTurner:ht:3/16/82

## ANNEX TO EVALUATION OF PHASE I

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### Reference People interviewed :

#### USAID/Rabat

- Mr. Gary Bricker - Office of Technical Projects
- Mr. Andres Acedos - Procurement Officer
- Mr. Max Luggasi - Controller's Office
- Mr. Harold Fleming - Mission Director
- Mr. William Erdahl - Program Officer
- Dr. Thomas Eighmy - Economist

#### CDER/Marrakech

- Mr. Abdelhaq Fakhani - Director of the Center for Development of Renewable Energies
- Mr. Mohamed M'zabi - Assistant Director of the Center for Development of Renewable Energies

#### DDRE/Rabat

- Mr. H. Houdaigui - Director of the Division for Development of Energy Resources
- Mrs. El Asaad - Assistant Director
- Mr. Nadil - Government Clerk
- Mr. Abdelhay Ibnyahya - MEM Architect