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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY  
AGENCY FOR INTERNATIONAL DEVELOPMENT  
WASHINGTON, D.C. 20523

PROJECT PAPER

TUNISIA: Rural Potable Water Institutions  
(664-0337)

March 28, 1986

UNCLASSIFIED

**PROJECT DATA SHEET**

**A** A = Add  
C = Change  
D = Delete

Amendment Number \_\_\_\_\_

Page **3**

**2. COUNTRY/ENTITY** Tunisia

**3. PROJECT NUMBER** 664-0337

**4. BUREAU/OFFICE** ANE 03

**5. PROJECT TITLE (maximum 40 characters)** Rural Potable Water Institutions

**6. PROJECT ASSISTANCE COMPLETION DATE (PACD)** MM DD YY  
03 31 91

**7. ESTIMATED DATE OF OBLIGATION (Under "B" below, enter 1, 2, 3, or 4)**

A. Initial FY 86 B. Quarter 2 C. Final FY 86

**8. COSTS (\$000 OR EQUIVALENT \$1 = )**

A. FUNDING SOURCE	FIRST FY 86			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total			6500			6500
(Grant)	(1689)	(4811)	(6500)	(1689)	(4811)	(6500)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S.						
1.						
2.						
Host Country		3400	3400		3400	3400
Other Donor(s)						
<b>TOTALS</b>	1689	8211	9900	1689	8211	9900

**9. SCHEDULE OF AID FUNDING (\$000)**

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ES	660	545				6500		6500	
(2)									
(3)									
(4)									
<b>TOTALS</b>						6500		6500	

**10. SECONDARY TECHNICAL CODES (maximum 8 codes of 3 positions each)** 240

**11. SECONDARY PURPOSE CODES** 510

**12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)**

A. Code BR

B. Amount

**13. PROJECT PURPOSE (maximum 480 characters)**

To improve the quality of life of the rural poor in Central Tunisia by establishing a coordinated and decentralized institutional approach to rural potable water operations and maintenance, with user participation and user fees, demonstrating a model to the GOT which may be appropriate for adoption as a nationwide strategy.

**14. SCHEDULED EVALUATIONS**

Interim MM YY MM YY Final MM YY

03 87 03 89

**15. SOURCE/ORIGIN OF GOODS AND SERVICES**

000  941  Local  Other (Specify)

**16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a \_\_\_\_\_ page FP Amendment.)**

**17. APPROVED BY**

Signature: James R. Phippard

Title: Director, USAID/Tunis

Date Signed: MM DD YY 03 28 91

**18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION**

MM DD YY

ACTION MEMORANDUM FOR THE DIRECTOR

DATE: 26 March 86  
THROUGH: Rollo Ehrich, ARDO *RE*  
FROM: Egan, ARD *Egan*  
SUBJECT: Rural Potable Water Institutions Project (664-0337)

PROBLEM: Your signature on the Project Authorization (attached) and on the Face Sheet of the Project Paper (attached) is required to authorize and approve the subject project. 85 State 193291 and 85 State 374260 (attached at Annex V of the Project Paper) grant the Mission authority to authorize and approve the project.

DISCUSSION: Provision of potable water supply to the largely dispersed population of Central Tunisia was essentially neglected by donors and the Government of Tunisia (GOT) until the Sixth Five Year Plan Period (1982-1986). At that time government investment in water supply increased to almost 7 percent of the total investment budget. At approximately the same time, activities under the AID "Central Tunisia Rural Potable Water Subproject" started. During this period, approximately \$2.19 million of AID funds and \$888,000 equivalent in GOT contribution supported provision of safe, reliable potable water to approximately 45,000 rural inhabitants of Central Tunisia.

There remain at least 111,000 inhabitants still without access to potable water in Kasserine, and an additional approximately 50,000 in the neighboring delegations of Sened and Gafsa Nord. USAID/Tunis thus proposes to begin a new five-year project to provide an additional \$6.5 million of U.S. grant funds with an estimated \$3.4 million equivalent in GOT contribution to provide access to approximately 50,000 additional rural inhabitants. Because of the relative need in the delegations of Sened and Gafsa Nord in the Gafsa Governorate, USAID has agreed with the GOT to emphasize activities in these 2 delegations. USAID estimates that new project activities there may be funded up to a \$2.5 million level.

The goal of AID assistance in potable water is to improve the quality of life of the rural poor in the Central Tunisia Rural Development program area. The Project has 3 purposes:

1. Establish and refine a coordinated and decentralized institutional approach to rural water operations and maintenance, with user participation and user fees, demonstrating a model to the GOT which may be appropriate for adoption as a nationwide strategy;
2. Maximize water investments by improving site selection for new and improved water systems; and
3. Provide improved access to potable water for underserved rural populations.

The Project builds on activities and objectives of the Central Tunisia Rural Potable Water Subproject (664-0312.7). Resolution of problems of site maintenance and the desire to maximize opportunities for local participation were included in the authorization for PP preparation for that project. A covenant of this project has been that the Central Tunisia Development Authority (CTDA) design a recurrent cost recovery plan to encourage beneficiary participation in the operation and maintenance of potable water systems.

The new Rural Potable Water Institutions Project will emphasize the development of water user associations to be organized to manage water points and to implement user fees for potable water to cover the recurring costs of operations and maintenance. Leverage of this new project will give a push to interests and perceived needs of the GOT with respect to cost recovery. Recurrent costs have been perceived as a serious problem in the Governorate of Kasserine, yet no policy for governorate wide cost recovery has been developed. However, with the encouragement of the governor, in several cases, heads of delegations (sub-divisions of governorates) have required cost recovery plans to be adopted prior to the opening of new water points. Long range planning for potable water calls for the Société Nationale d'Exploitation et de Distribution des Eaux (SONEDE), a well-managed parastatal, to take over rural water provision by 2000 (except for highly dispersed areas with populations below 100). For this to take place, a cost recovery system must be in place.

The Project will undertake activities in three areas:

- A. Technology Transfer. Thirty new boreholes will be drilled, up to 4 extensions will be created and 2 pilot installations of house hook ups provided (at cost to consumers) in the project area of Kasserine Governorate, and the North Gafsa and Sened delegations of Gafsa Governorate.
- B. Local Institutional Development. Water User Associations will be established around new and existing water points in the project area. Associations will be established at motorized points in Kasserine Governorate and at new project water points in Gafsa Governorate to operate water systems and to recover operations and maintenance costs of water systems.
- C. Regional Institutional Development. A range of regional institutional development activities is planned. Within CTDA a new unit, the Unité d'Autogestion, will be established to support the creation and development of the associations and act as a facilitator in their dealings with other government entities. Services of a Tunisian A&E firm will be provided to CTDA engineering staff to assist with water point construction monitoring. Technical assistance will be provided to the maintenance brigade of the "Programme de Développement Rural" (PDR) to improve performance and capability for system repair. Site sanitation and improved home water storage will be the focus of TA to the Directorate of Public Health. The Unité also will work with regional and local water committees in monitoring operations and maintenance of water points.

AID-financed inputs include long and short-term technical assistance, research commodities, short-term participant training, and a fixed amount for well drilling and civil works development of water sites. The GOT will provide personnel for project management, local training costs, and equipment (pumpsets) for the new water points. These inputs are detailed in the attached Project Paper, which has been the subject of 2 PRCs during Fall 1985 and extensive review by two TDY RLAs.

The Project promotes USAID/Tunis' continuing policy dialogue with the GOT on improved management of scarce GOT budgetary resources through demonstration of effective user financial contributions to public water supply. The transfer of improved technologies--hydrogeologic, drilling, engineering, and institutional development of the Central Tunisia Development Authority and of the Water User Associations are of importance to the AID Mission. The private sector will be emphasized throughout implementation for design, installation and management.

RECOMMENDATION: That by signing this Action Memorandum, the Project Authorization, and the face sheet of the Project Paper, you authorize the Rural Potable Water Institutions Project in the amount of 6.5 million dollars for FY 1986 obligation with a PACD of 31 March 91.

Approved: \_\_\_\_\_

Disapproved: \_\_\_\_\_

Date: \_\_\_\_\_

Attachments:

- (1) Project Authorization;
- (2) ProAg, including Annex 1 and Annex 2;
- (3) Project Paper plus Annexes.

Clearances: ARD/CZargElAyoun Chab  
PROG/LMacary LM  
CONT/EHardy \_\_\_\_\_  
PD/MKarns MK  
RLA/LDe Soto (Draft)  
RLA/AWilliams (Draft)

Egan  
ARD/JSmith & WEgan:hk:03/11/86:Doc.0776R

cc: PROG, CONT, PD, ARD, C&R-2

## PROJECT AUTHORIZATION

Name of Country: Republic of Tunisia      Name of Project: Rural Potable Water Institutions  
Project Number: 664-0337

1. Pursuant to Section 531 of the Foreign Assistance Act of 1961, as amended (the "Act"), I hereby authorize the Rural Potable Water Institutions Project (the "Project") for the Republic of Tunisia (the "Cooperating Country") involving planned obligations of not to exceed \$ 6,500,000 in grant funds in FY 1986, in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the Project. The planned life of the Project is five years from the date of initial obligation.

2. The Project will consist of: (a) establishing and refining a coordinated, decentralized, institutional approach to rural potable water operations and maintenance, with user participation and user fees which may be appropriate for adoption as a nationwide strategy; (b) maximizing water investments by improving site selection for new and improved water systems; and (c) providing improved access to potable water for underserved rural populations.

3. The Project Agreement which may be negotiated and executed by the officer(s) to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

#### 4. Source and Origin of Commodities, Nationality of Services.

Except as provided in paragraph 7 below, commodities financed by A.I.D. under the Project shall have their source and origin in the Cooperating Country or in the United States, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the Cooperating Country or the United States as their place of nationality, except as A.I.D. may otherwise agree in writing.

Ocean shipping financed by A.I.D. under the Project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

5. Conditions Precedent. The Project Agreement shall contain conditions precedent in substance as follows:

a. Condition Precedent to Initial Disbursement. Prior to any disbursement under the Project or to the issuance of any commitment documents pursuant to which disbursement will be made, the Cooperating Country shall furnish in form and substance satisfactory to A.I.D. evidence (1) that the Cooperating Country is committed to creating within the Central Tunisia Development Authority (CTDA) a new organizational unit that reports directly to the President Director General and has the purpose of providing support and training to the Potable Water User Associations (Associations) of Central Tunisia; and (2) that CTDA will have an adequate budget to support at least one Grade A and three Grade B officers for this new unit and to provide these officers with the means to carry out their functions.

b. Conditions Precedent to Additional Disbursements.

1) Prior to disbursements under the Project, or to the issuance of commitment documents pursuant to which any disbursement will be made, for any project activity except for the Water Resources Study, the USAID personal services contract and the construction of the first four new water systems, the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D.:

a) Evidence that the Associations in the Kasserine and Gafsa Governorates will be accorded such status, in a timely manner, that enables them to collect and disburse funds and to enter into contracts for the operation and maintenance of the water systems for which they are responsible; and

b) Evidence that the new unit has been created in the CTDA and that CTDA has a sufficient operating budget to adequately staff the new unit and allow it to carry out its functions.

2) Prior to any disbursements under the Project, or to the issuance of any commitment documents pursuant to which such disbursements will be made, for any one of the remaining water systems under the Project, (excluding the initial four), the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D.:

a) New criteria for the selection of the sites;

b) Evidence that the proposed site (i) has been selected according to the new criteria; (ii) has been approved by the Regional Potable Water Committee; (iii) has an established and operational Association in connection with it; and (iv) is being constructed according to plans and specifications approved by A.I.D.; and

c) A signed contract with an A&E firm.

6. Covenants. The Project Agreement will have covenants in substance as follows:

a. Water User Associations. The Cooperating Country covenants that:

- 1) It will continue to support the establishment of Associations at all public rural potable water points in the Kasserine Governorate and at Project funded sites in Gafsa Governorate over the course of the Project;
- 2) The Associations shall be responsible for recurrent operations and maintenance costs of their potable water systems and for site sanitation and health conditions of the sites around which they are formed;
- 3) It will support and respect the financial autonomy of these Associations within guidelines to be developed by the Regional Potable Water Committee, in the collection and disbursement of funds while carrying out the tasks noted in 2) above.

b. Recurrent Cost Recovery Plan. The Cooperating Country agrees that by June 30, 1988, it will present to A.I.D. an operation and maintenance cost recovery plan with quantitative benchmarks, to implement progressively, within the life of the Project, recurrent cost recovery in the public, non-SONEDE water points in the Project area. This plan will include all such Project and non-project funded motorized water points in the Governorate of Kasserine and all such Project funded sites in the Sened and Gafsa Nord delegations of the Gafsa Governorate.

7. Waivers. Based upon the justification in Annex Q of the Project Paper and upon the Authority redelegated to me under Redelegation of Authority 113.3A, I hereby:

- a. Waive the requirements to procure vehicles from the United States to permit the procurement of approximately 4 project vehicles at a cost of no more than \$50,000 (excluding transportation costs) from countries included in Geographic Code 935;
- b. Conclude that special circumstances exist which permit a waiver of the provisions of 636 (i) of the Act and do hereby waive those provisions; and
- c. Certify that exclusion of procurement from free world countries other than the Cooperating Country and countries

included in Code 941 would seriously impede the attainment of U.S. foreign policy objectives and the objectives of the foreign assistance program.

Date: 3/27/86

Signature: James R. Phippard  
Director USAID/Tunis

Clearances: ARD/Wegan [Signature]  
ARD/CZargElaoun [Signature]  
ARD/JSmith [Signature]  
ARD/PNovick [Signature]  
PD/MKarns [Signature]  
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CONT/EHardy [Signature]

RLA: [Signature] / AWilliams (Draft):hk:03/11/86:Doc. 0745R

MAR 17 1966

RURAL POTABLE WATER INSTITUTIONS

664-0337

PROJECT PAPER

WANG No. 0722R

EXECUTIVE SUMMARY

Provision of potable water supply to the largely dispersed population of Central Tunisia was essentially neglected by donors and the Government of Tunisia (GOT) until the Sixth Five Year Plan period (1982-1986). At that time, government investment in water supply increased to almost 7 percent of the total investment budget. At approximately the same time, activities under the AID "Central Tunisia Rural Development Program Rural Potable Water Project" (664-0312.7) got underway. During this period, approximately \$ 2.19 million of AID funds and \$ 888,000 equivalent in GOT contribution supported provision of safe, reliable potable water to approximately 45,000 rural inhabitants of Kasserine Governorate.

There remain at least 111,000 inhabitants still without access to potable water in Kasserine, and an additional approximately 50,000 in the neighboring delegations of Sened and Gafsa Nord. USAID/Tunis will begin a new five-year project to provide an additional \$6.5 million of U.S. grant funds and up to an estimated \$3.4 million equivalent in GOT contribution to provide access to an additional approximately 50,000 rural inhabitants. The \$3.4 million GOT contribution is comprised of \$2.5 million from government sources and approximately \$0.9 million provided by the Water User Associations to be formed under the Project. US grant funds totaling \$6.5 million will be obligated during the second quarter of FY 86. It is anticipated that up to \$2.5 million of this amount will be expended for development of water resources in Sened and Gafsa Nord.

In addition to improving access in the short term, the Project seeks to assure that this access is sustained over time. Building upon activities already underway in Kasserine, the Project will establish and refine a coordinated and decentralized institutional approach to rural water operations and maintenance, with user participation and user fees, demonstrating a model to the GOT which may be appropriate for adoption as a nation-wide strategy. The Project will support the development of water site specific Water User Associations which, by 1991, will be covering 100 percent of recurrent operations and maintenance costs of the motorized well sites. The GOT will also be able to continue to maximize new investments, through the development of up-dated site selection criteria for improved water systems in rural areas.

AID-financed inputs include long and short-term technical assistance, research commodities, short-term participant training, and a fixed amount for well drilling and civil works development of water sites. The GOT will provide personnel for project management, local training costs, and equipment (pumpsets) for the new water points.

- 3 -

The Project promotes USAID/Tunis' continuing policy dialogue with the GOT on improved management of scarce GOT budgetary resources through demonstration of effective user financial contributions to public water supply. The transfer of improved technologies--hydrogeologic, drilling, engineering, and management--is stressed. Emphasis on the institutional development of the Central Tunisia Development Authority and of the Water User Associations is of importance to the AID Mission. Emphasis on the private sector throughout, in design, installation and management, is key.

Table of Contents

1. Background
  - 1.1 The CTRD Program
  - 1.2 Previous Accomplishments
2. Project Rationale & Description
  - 2.1 The Continuing Problem
  - 2.2 Project Goal and Purpose
  - 2.3 Project Components
    - 2.3.1 Technology Transfer: New Interventions
    - 2.3.2 Institutional Development: Water User Associations
    - 2.3.3 Institutional Development: The Regional Level
  - 2.4 Conformance with Policy Objectives
    - 2.4.1 Conformance with AID Policy Objectives
    - 2.4.2 Conformance with Other Donor Strategies
3. Cost Estimate and Financial Plan
  - 3.1 Financial Plan
  - 3.2 Financial Procedures
4. Implementation Plan
5. Summaries of Analyses
  - 5.1 Policy
  - 5.2 Institutional
  - 5.3 Technical
  - 5.4 Social
  - 5.5 Financial
  - 5.6 Economic
  - 5.7 Environmental
  - 5.8 Energy Use and Production
  - 5.9 Project Administration and Management
6. Monitoring & Evaluation Plan
  - 6.1 Project Monitoring
  - 6.2 Evaluation Plan
7. Conditions Precedent and Covenants

ANNEXES

- A. PID Approval Message
- B. Log Frame
- C. FAA 611(e) Certification
- D. 611(a)(1) Certification
- E. GOT Commitment: Policy and Practice
- F. Institutional Analysis
- G. Technical Analysis
- H. Social Analysis
- I. Financial Analysis
- J. Economic Analysis
- K. Project Administration & Management
  - 1. Summary Procurement Plan: Commodities
  - 2. Technical Assistance
  - 3. Training
- L. List of Persons Contacted
- M. Selected Bibliography
- N. List of Acronyms
- O. Concurrent Expenditures by Source/Calendar Year
- P. Statutory Checklist
- Q. Source/Origin Vehicle Waiver Justification
- R. Other Donor Programs
- S. FAR Procedures
- T. Environmental Determination
- U. GOT Request
- V. Delegation of Authority
- W. Congressional Notification
- X. AID and GOT Project Budgets (LOP)

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William Egan, Rural Development Officer  
Mark Karns, Project Development Officer  
Louis Macary, Program Officer  
Ernest Hardy, Controller  
Anne Williams, RLA  
Lisa De Soto, RLA

USAID/Tunis Approval Committee

James R. Phippard, Director

## 1. BACKGROUND

### 1.1 The CTRD Program

The Central Tunisia Rural Development (CTRD) Program (664-0312) is a multi-sectoral rural development program with the goal of improving the quality of life of approximately 300,000 people of the interior of Tunisia. AID's support to the program began in U.S. Fiscal Year (FY) 1979, and has encompassed projects in dryland and irrigated agriculture; health; range and pasture improvement; and potable water supply. The support is provided to and through the Central Tunisia Development Authority (CTDA), an autonomous agency of the Government of Tunisia (GOT) under the Ministry of Agriculture (MOA). The initial 10 year CTRD program runs through 1989. A major formative evaluation to assess accomplishments to date and recommend actions for the future is planned for the second quarter of FY 86. This Project Paper for the Rural Potable Water Institutions Project will be but one element of that future strategy.

### 1.2 Previous Accomplishments

AID assistance to the CTRD in potable water began in 1980 with the signing of a sub-project to the CTRD program entitled "CTRD Rural Potable Water" (No. 664-0312.7), the previous project. It had as its goal "improved quality of life in the CTRD program area". The project purposes were:

- 1) Improved access of the dispersed poor in CTRD project area to potable water;
- 2) Application by CTDA of a rational policy for siting, designing and maintaining rural potable water systems; and
- 3) Testing and demonstrating in Central Tunisia lower-cost technologies for providing potable water to dispersed populations.

These purposes have been achieved, although the means of achievement differed from that intended in the original Project Paper. Table 1 provides information on the technical interventions of the previous project designed to achieve its first purpose. Although site-specific demographic data is poor, it can safely be assumed that approximately 250-300 households or approximately 1500 persons use each site. An additional estimated 50,000 inhabitants of rural Kasserine will have access to safe, reliable drinking water by the Project PACD in March 1991.

TABLE 1: CTRD RURAL POTABLE WATER TECHNICAL INTERVENTIONS

	Planned 5/80 PP	Changed* 1982	Achieved 8/85	Projected LOP Total 9/86
Springs capped	60	16	16	16
Surface wells lined and motorized	10	12	11 (1 negative)	11
Boreholes drilled, cased, equipped and and motorized	90	18	18 drilled; of which 14 cased, (4 negative); of which 8 equipped and functioning	14 equipped and functioning

\* The number of interventions was decreased due to gross underestimation of drilling costs in the original project.

In terms of the second purpose, CTDA water policy, gains have been made. In terms of siting, the water points established under the previous project were selected through application of criteria established by a University of Wisconsin technical assistance team in collaboration with CTDA staff. Subsequent evaluations suggest that most sites meet these criteria in terms of improving the quality and quantity of water to the population in a 4 kilometer radius at a reasonable cost-per-beneficiary. The previous sites were, however, selected during 1980 and 1981. Since that time, more than 20 new public water points have been installed by CTDA (AID and/or GOT financing), and another 20 by other organizations. Over 800 private surface wells have been financed, some through AID or IBRD assistance, by private farmers for irrigation and household use. An important step in the proposed project will be a complete updating of data on water resources in the area, and a probable revision of criteria to meet changing needs.

With the increased access to better quality water has come increased demand by the rural population for improved civil works design and improved maintenance. Site sanitation is still difficult, as the GOT has delegated the responsibility to "the people" with little training or assistance to maintain often inappropriate civil works. Overall operations and basic maintenance--i.e., provision of fuel and oil and minor repairs--is becoming a financial and administrative burden to the GOT as motorized sites increase. Because of these problems, and based on the recommendations of the 1983 evaluation, the CTDA has recently contracted the services of a consultant to assist in the establishment of Water User Associations (WUAs) at each site. These groups are responsible for site sanitation and are charged with progressively paying for operation and maintenance costs of "their" wells. To date, approximately 150 sites have had preliminary meetings, approximately 40 have begun paying at some level for these costs, and approximately 5 are paying on a regularized basis. These initiatives are promising but much more needs to be done to assure benefits are sustained over time. The CTDA policy, however, regarding maintenance is certainly encouraging.

The third purpose of the previous effort was achieved in a way not originally foreseen. Low cost technologies were tested and demonstrated and are operational in rural Central Tunisia. The findings of the 1983 evaluation, however, coupled with experience throughout the project, have led to adoption over time of a modified definition of "low cost". That is, the evaluation and subsequent work have demonstrated that hand dug (shallow) wells are the least costly method per capita of water supply development. It has been concluded, however, by CTDA and AID, that drilled boreholes, which are relatively more costly, are more cost effective on a per capita basis for improving water supply access. The installation of hand dug shallow wells is now encouraged through a domestic, partially subsidized credit program to private farmers. Although the water is subject to contamination and not considered potable, its use for irrigation and animal watering decreases pressure on public uncontaminated sites and thus improves human access overall. Through the previous project and other efforts, most traditional productive springs or wells in Kasserine have already been improved. The GOT, with AID support, has adopted a strategy of installing deep boreholes where possible to ensure equity and access for potable water for human consumption and those unable to install private wells.



FIGURE 1

CTRD - PHASE II POTABLE WATER PROJECT  
INTERVENTION AREA

## 2. PROJECT RATIONALE & DESCRIPTION

### 2.1 The Continuing Problem

The CTRD Rural Potable Water Project will continue until September 30, 1986 to allow for final equipping of the remaining boreholes. There exists, however, a continuing need for year-round access to safe water in rural central Tunisia.

Areas in the southern portion of Kasserine Governorate, and two contiguous delegations of Gafsa Governorate--North Gafsa and Sened--are particularly underendowed and were not included in the previous project. Through PIL No. 5 of Project 664-0312, dated Sept. 30, 1985, USAID concurred with CTDA's plan to extend the zone of the CTRD program to coincide with CTDA's zone of responsibility. Since previously CTRD had not operated in the southern regions of CTDA's zone, USAID has little prior experience there (particularly in the delegations of Gafsa governorate, Sened and Gafsa Nord, a governorate in which USAID has not previously worked.) Because of their history of relative neglect and need, USAID has agreed with the GOT to emphasize activities in these 2 delegations. USAID estimates that if water site selection criteria and technical feasibility permit, new project activities in these two delegations will be funded up to the level of \$2.5 million.

With respect to the two delegations in Gafsa governorate, plans are to build the institutional framework of regional and local water committees, as was done in Kasserine in the previous project, over an abbreviated time frame and afterwards to continue with the proposed activities as described herein. Thus, where below policies and procedures are described in terms of Kasserine governorate, the same steps are understood as planned for the two delegations of Gafsa on a time-lagged basis. Figure 1 provides a map of the CTRD Potable Water Project area.

Based on the 1984 preliminary census information, the total population of Kasserine was 298,000, of which 30 percent was urban. All urban dwellers have access to safe water. Of the remaining 208,909, 3 per cent, or roughly 6,200 people, get water from one of the 12 SONEDE systems (see below). This group presumably lives on the edge of an urban area. An additional approximately 61,500 persons have benefitted from the previous project efforts. An estimated 30,000 additional rural inhabitants have access to one of approximately 20 GOT-funded improved systems. Thus approximately 111,000 still do not have access to safe, reliable potable water. As demonstrated in Annex H, Social Analysis, approximately 70,000 of this group consider themselves "very far" from a water source.

The 1984 population of Sened delegation in Gafsa Governorate was approximately 23,000, of which 83 per cent, or 19,000 are rural and presumed to lack access to potable water. The North Gafsa 1984 population is estimated at 32,000, with no data available during the design on urbanization or access to water. It can be

conservatively assumed that a minimum of 25,000 people in North Gafsa and 19,000 in Sened are without safe, reliable drinking water.

Section 2.4 below provides information on other donor activities in water supply in Tunisia. Of relevance is the IBRD Seventh Loan to the GOT for Rural Water Supply. Working through the Tunisian parastatal Société Nationale d'Exploitation et de Développement des Eaux, or SONEDE, over the next 7 years approximately 600 rural communities will be provided potable water. Approximately 30-40 of these communities are targetted in the Kasserine Governorate. It is not yet clear how many of these communities will actually get new water points and how many with existing improved systems will be taken over by SONEDE. Perhaps as many as 55,000 rural inhabitants of Kasserine governorate will be covered by 1991 through SONEDE activities. SONEDE plans in Sened and North Gafsa are as yet unspecified, with a total of 22 systems planned for Gafsa Governorate as a whole.

The SONEDE approach to provision of rural water, however, requires that water distribution points are metered and that operating, maintenance and some distribution costs are fully covered. SONEDE has expressed concern about the very high costs of maintaining a reliable water supply in the rural areas, both in terms of affordability for the rural inhabitants and the high administrative costs to SONEDE for administering these systems in their traditional manner. SONEDE is thus undertaking a study, due to be completed in spring or early summer of 1986, to assess options with regard to costs and to institutional arrangements. SONEDE has expressed a keen interest in the pilot efforts in Kasserine with Water User Associations. Should the AID-funded efforts be able to demonstrate viability, it is likely that SONEDE will build upon these and use them as a model for elsewhere in the country.

As SONEDE moves slowly into rural Kasserine, however, there will remain at least 100,000 people in 1984 figures who lack access to safe water. That is, in Kasserine there are 111,000 and in Sened and North Gafsa a total of 44,000 who are currently without safe water. It is assumed that SONEDE and others will cover a minimum of 55,000 between now and 1991. In terms of responding to basic needs and to equity concerns paramount in Tunisia's development plans, AID proposes to support provision of water to approximately 50,000 of these inhabitants in Kasserine, North Gafsa and Sened. The remaining 50,000 are presumed to be in extremely dispersed areas. The results of the Water Resources Mapping Survey will provide more data about the needs of this group and the appropriateness of extending existing systems for their future service.

Of at least equal importance to provision of basic needs in the short-term is the concern with sustaining gains made over time. The approximately 40 motorized water points in rural Kasserine currently cost the GOT on an average of \$3,500 per point per year to maintain. It is clear that the government must begin recuperating costs for at least operation and primary maintenance now if it is to sustain productive investments in the future. It is less clear but strongly assumed that the dispersed rural populations of such places as Kasserine, North Gafsa and Sened will place a difficult administrative burden on SONEDE or other governmental entities as water is made available on a cost recovery basis. Innovative solutions to administering cost recovery on a decentralized basis are needed to sustain the system and consolidate gains. Work on these solutions must start now, before new pumpsets and equipment begin to require major repair.

## 2.2 Project Goal and Purpose

The proposed project aims to meet the needs of increasing access to potable water for the dispersed poor while providing for this access to be assured over time. The overall CTRD program goal will be retained to:

Improve the quality of life for the rural poor in the program area.

Measures of goal achievement are largely unquantifiable. Based on experience elsewhere in Tunisia and worldwide, it is assumed that increased access to water results in increased use of water, and that this increased use leads to better health overall. The Regional Public Health Directorate in Kasserine, however, only began collecting information on water-borne disease in 1984, and statistics are only available for persons with such a disease who visit one of the 60 rural dispensaries or 5 hospitals. The vast majority of the population suffering from diarrhea, ameobiasis, scabies, or other water-borne illnesses do not always report to these institutions, and tend to suffer quietly and chronically.

A second indicator of goal achievement is that households will spend less time collecting water for human consumption, putting time saved to more productive uses. Statistically unreliable but nonetheless suggestive data currently available suggest that household members may spend as much as 5-6 hours each day fetching water. Some of the time savings for each family member can be assumed to be reallocated to more productive activity.

Through an emphasis on rural inhabitants' financial coverage of operations and maintenance costs over time, the GOT can assume a

minimum savings of 160,000 TD per year. It would be desirable that this savings will be invested in other social services or productive activities, including improved water supply, but it is likely that the GOT will simply consider it money saved and put it where it perceives it to be most needed.

In order to support the project goal, the project purpose will be:

- 1) Establish and refine a coordinated and decentralized approach to rural water operations and maintenance, with user participation and user fees, demonstrating to the GOT a model which may be appropriate for adoption as a nationwide strategy;
- 2) Maximize water investments by improving site selection for new and improved water systems; and
- 3) Provide improved access to potable water for underserved rural populations.

Measures of purpose achievement (per Annex B, Logframe, End Of Project Status) are more quantifiable. By the end of 1990, Water User Associations will have been established at all water points in Kasserine Governorate and at all project sites in Sened and North Gafsa, and at least 85 percent of them will be covering 100 percent of operations and maintenance costs for "their" systems. Governmental involvement in these systems will be minimal, as they will have independent status and autonomous financial control. The Associations will be represented to the GOT regional entities through Potable Water Committees established at the Delegation and Regional levels. Although these Committees are now made up of GOT employees, it is hoped that WUA representatives will be members of the Committees in at least 4 of the (currently 14) delegations involved.

In addition to the committees, the development of the Associations as viable institutions will be supported by private efforts. By the end of 1990, it is planned that the WUAs will have demonstrated linkages with local private sector entrepreneurs through the execution of contracts for maintenance, repair, and provision of fuel and oil. Finally, two targets related to replicability will be achieved: 1) SONEDE will have assumed responsibility for all O&M costs and for bill collection from water users for at least one site, administered by a WUA, begun with Project support; and 2) at least one other rural area of Tunisia will be adapting the WUA model on the ground.

22

In terms of the second purpose, by the end of 1990 the Kasserine Governorate Potable Water Committee will have adopted a stronger policy for guiding site selection which will include cost-effectiveness analysis of alternative approaches (i.e., new installations versus extensions of existing systems) and regional, spatial and demographic considerations. An improved hydrogeologic data base in Southern Kasserine, North Gafsa and Sened will serve as a basis for more rational exploitation in these currently unknown areas.

Finally, in terms of the third purpose, at least 30 new installations (a minimum of 26 productive boreholes out of 30 drilled, plus 4 extensions) will be providing potable drinking water to an additional estimated 45,000-50,000 underserved rural inhabitants. Experimentation with low cost house hook-ups (the New Mexico Model, or NMM) in clustered areas will provide data on which to continue improving access over time.

### 2.3 Project Components

In order to achieve the End of Project Status discussed above, the project will sustain efforts in three components. Each of these is discussed below.

#### 2.3.1 Technology Transfer: New Interventions

AID will finance the execution of 30 new boreholes (of which 26 are expected to be productive), up to 4 extensions, and up to 2 pilot installations of house hook-ups (at cost to consumers) in the project area of Kasserine Governorate, North Gafsa, and Sened. The initial 4 boreholes in 1986 will be approved by AID based on the existing "CTRD Water Policy" in the Grant Agreement for the previous project. They will be installed based on existing standard designs following existing procedures in order to keep up the program momentum. Concurrently with installation of these boreholes, contracting will be initiated for two efforts:

- 1) One Host-country contract will be put to bid for a Tunisian A&E firm with experience in rural water supply. This contract will be for the life of the project (five years), and will be for: a) revision of standard designs with particular consideration of civil works, sanitation and drainage; b) adaptation over time of these standard designs to site-specific conditions in consultation with local WUAs; c) the preparation of quantities for part of bid packages to be offered by CTDA; and d) construction monitoring based on a time and materials contract, so that each site under construction is visited at least once each month. This method of construction monitoring has been employed under the

AID-funded CTDA Rural Health Project in Central Tunisia and on an AID-funded housing project, and has been found an efficient and satisfactory use of private sector resources.

Administration/Management, Annex K, provides a draft Scope of Work for this contract.

2) One direct AID contract will be with a U.S. organization which will sub-contract with a Tunisian social science research institution to undertake a Water Resources Mapping Study. Based on existing maps prepared for the area, and on 1974 1:25,000 aerial photographs available from the Ministry of Agriculture, the joint effort will undertake analysis and ground-truthing to prepare a set of 1:50,000 or 1:25,000 maps incorporating: a) all existing water points, including private wells, oueds, and irrigated perimeters, in the project area of Kasserine Governorate, North Gafsa, and Sened; b) population density mapping; and c) location of prominent social, administrative, political, and/or cultural structures including roads, schools, dispensaries, and mosques. The overall purpose of the contract is to provide the CTDA with improved data for spatial analysis for optimum location of new water points. Annex K provides a more detailed draft Scope of Work for this study.

The first contract (A&E), as stated, will run for the life of project. The second contract, for the Water Resources Study, is estimated to require 6 months of time, and approximately 50 person months of work. Following its completion, an American geographer familiar with resource mapping in developing countries will spend two months working with personnel of the CTDA on application of this improved data base to ongoing projects. Of particular importance will be the work with CTDA personnel involved in project management, i.e. the current staff of the Amenagement Hydro-Agricole (AHA) service, and the proposed "Autogestion" Unit described below. The consultant and CTDA geographer will work with the AHA and unit staff in revising the "CTDA Water Policy" and in selecting potential points for AID-funded interventions under the proposed project. The consultant will also work with all involved to develop criteria for AID-funded "extensions" to dispersed populations. These new criteria will be proposed, along with the new sites, at a meeting of the Kasserine Regional Rural Water Committee. A similar series of events will take place in Gafsa Governorate for the delegations of Sened and North Gafsa. The results of the Regional Rural Water Committee deliberations will be provided to AID. USAID/Tunis and the CTDA will mutually concur on sites for installation and extensions in a joint Project Implementation Letter (PIL) following this process.

Following this rather lengthy site selection and standard design process, a relatively standard pace of installation will proceed. The current process for installation of new water points is illustrated at Figure 2. Modifications to this process involve the addition of the Tunisian A&E firm and the addition of consultation with WUA (see 2.3.2 below) and are illustrated at Figure 3. No additional permanent staff to any of the technical services involved are contemplated, although strengthening through equipping and training is provided. See Section 2.3.3 and Annex G, Technical Analysis, for further details on technical aspects.

### 2.3.2 Institutional Development: Water User Associations

Building on promising efforts in Kasserine to date, Water User Associations will be established around each new and existing water point in the project area. These associations will serve as a model for management of dispersed water points serving a scattered population, and will serve as a useful base for further participation in local level development and management.

The principal tasks of the WUAs will be:

- 1) to raise money to cover operations and maintenance costs, including fuel, salary for the pump operator, basic maintenance, and site sanitation and improvements;
- 2) to undertake sanitation activities around the pump site, and to provide input into certain civil works design features, including location of the animal trough and the spigots where people fill their tanks and other containers, and the location of the reservoir;
- 3) to undertake health education, in conjunction with the health education program of the public health service; and
- 4) to maintain site discipline, to organize labor inputs, and to settle disputes concerned with drawing and hauling potable water.

FIGURE 2: CURRENT ANNUAL PROCESS FOR INSTALLATION OF NEW WATER SYSTEM IN KASSERINE GOVERNORATE

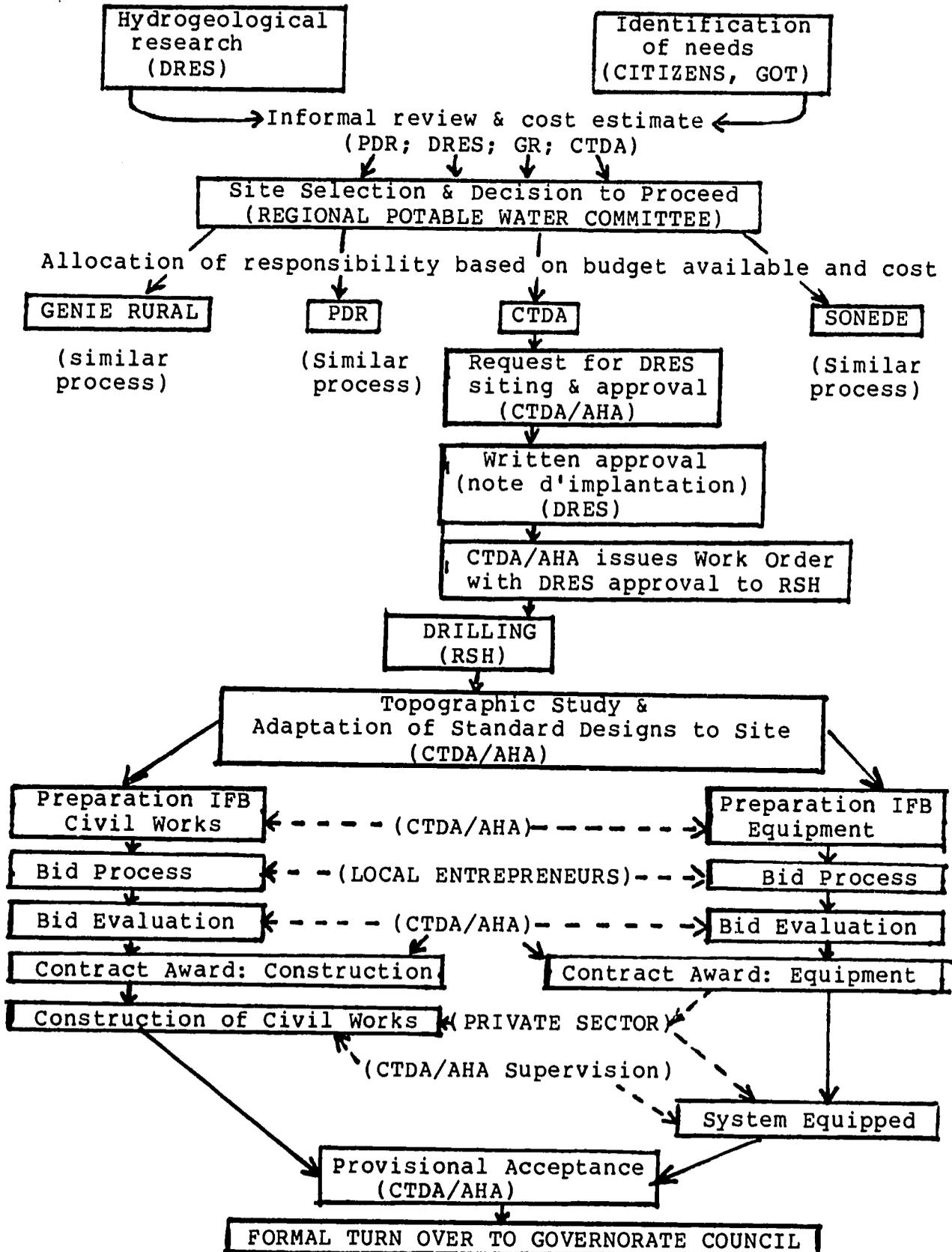
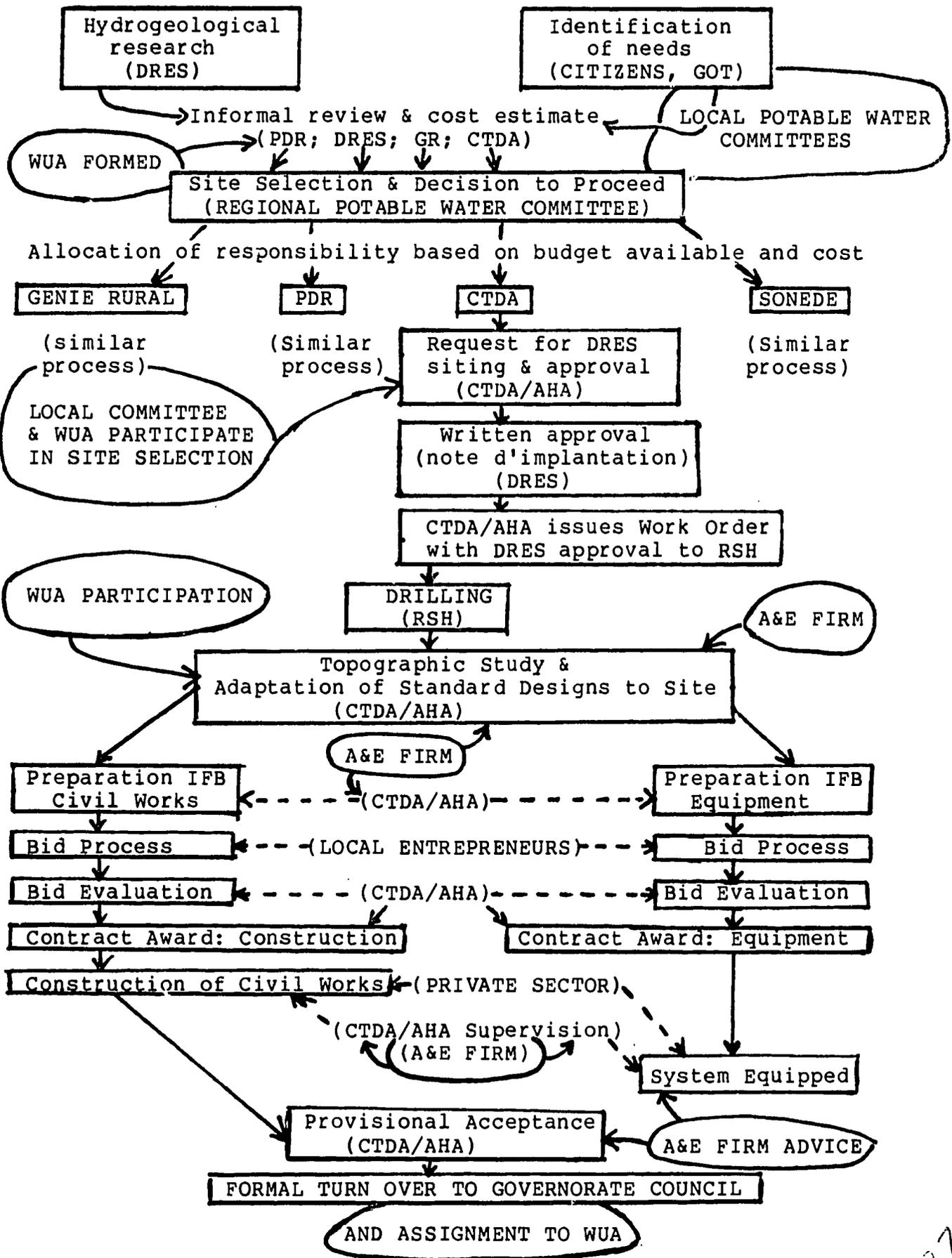


FIGURE 3: PROPOSED ANNUAL PROCESS FOR INSTALLATION OF NEW WATER SYSTEM IN KASSERINE GOVERNORATE



The GOT will establish an official base for these Associations during the first year of the project through issuance by the Governors of Kasserine and Gafsa of a "visa" (essentially a legal permit to operate as a business). This official order is expected to be issued by the Governor of Kasserine and the Governor of Gafsa as an interim step. Provision of this interim legal base will enable development of the Associations to continue without overloading them with a hastily written and possibly cumbersome set of regulations and procedures.

The members of the WUA will be those individuals or households who habitually take water from the water point. Each member of the WUA will make a financial contribution to be used for operations and maintenance, repairs, and improvements. Based on experience to date, it is anticipated that each WUA may have a slightly different system of differential payment. Each WUA will collect and administer its own funds, keeping such records as are necessary for accountability, and maintaining the account at a local bank or post office.

In order to carry out the above tasks, each WUA will have a managing committee including representatives of all social and economic categories in the population served. Creation of this sort of representative organization will require considerable work, as this is a new form of social organization for rural Central Tunisia. Section 2.3.3 below describes a support Autogestion Unit to be located at the CTDA to facilitate this organization.

Within each WUA management committee, three figures will be particularly key: a president or presiding member; a treasurer; and the guardian-pumpist. In-country training and some possible in-country visits to other areas with experience in local management will be provided to assist these people in their work.

By the end of the project, each WUA will be fully covering all annual operations and maintenance costs, including the salary of the guardian-pumpist. In addition, through linkages with local private sector entrepreneurs, the WUAs will be undertaking, arranging and/or paying for basic or "first level" maintenance of pumpsets.

### 2.3.3 Institutional Development: Regional Level

This project component is based on the assumption that SONEDE will begin assuming responsibility for rural potable water supply in the 7th Plan period (1987-1991) and will, by the year 2000, be responsible for all potable water in Tunisia. The IBRD has long supported SONEDE activities, and through its 7th Loan is supporting the development of this rural capability. SONEDE's capabilities are proven and solid, and its planned pace of expansion seems appropriate.

The institutional development component, then, will focus on streamlining and improving the capabilities of organizations (other than SONEDE) involved in rural water supply in Kasserine, North Gafsa, and Sened to both install systems and to provide support to Water User Associations in their operations and maintenance. Institutional redundancy and competition will be reduced, and collaboration reinforced. A summary of the planned interventions follows:

- Strengthening the performance of CTDA/AHA and cooperating technical services involved in the actual installation of water points will be achieved through the private A&E firm mentioned under Section 2.3.1 above. As illustrated at Figure 3, the firm will absorb and/or provide technical assistance and advice about a number of functions currently carried out by the small AHA staff. Through preparation of site-specific plans and through monthly site visits, the firm should be able to hasten the pace of civil works and equipping of wells, which has historically been a bottleneck. The more frequent site visits should also provide for informal on-the-job training of local private sector construction contractors and suppliers.
- Strengthening the capacity of the AHA and related technical services is less of an issue in that it is assumed SONEDE will be taking over most of the responsibilities in the 15 year period. Short-term participant training is provided, however, for selected personnel to broaden their skill base in technical areas.
- Strengthening the performance and the systems once in place will be the task of a new office within the CTDA. This office, the Unité d'Autogestion, will be established early in the project and will report directly to the President Director General (PDG) of CTDA. It will be staffed by four professionals with experience in the social sciences. Its main task will be to organize, support and train Water User Associations. Short-term technical assistance to assist this office is to be provided for 2 months in 1986, and on a repetitive basis for one month each year thereafter. Short-term third country training is proposed for study tours to other countries engaged in similar activities.
- Strengthening the performance and capability for repair of systems beyond that which the Associations can handle will be undertaken through long-term technical assistance to the maintenance brigade of the PDR. One American and

one Tunisian advisor will work together with the brigade to establish preventive maintenance schedules and to improve spare parts inventory systems. An early task will be definition of "first level" and "second level" maintenance to determine who pays for what. Continued emphasis on use of private sector suppliers, as the PDR is now doing, will be included. The advisors and the brigade will work closely with the Unité d'Autogestion in training and backstopping guardian-pumpists.

- Strengthening the site sanitation work and improved home storage of water will be undertaken through the Kasserine-Gafsa Regional Directorates of Public Health in cooperation with Local Potable Water Committees and Associations. Short-term technical assistance for preparation of improved health education materials and methods is provided to the Directorate, as is a small budget for production of these materials.

- Strengthening the coordination of all of the above will be facilitated through the Unité d'Autogestion and implemented through the Regional and Local Potable Water Committees established during the previous project. These committees, as illustrated in Figures 2 and 3, have been active in site selection. Their role in monitoring operations and maintenance will be enhanced through provision of short-term study tours and more frequent meetings arranged through the Unité.

By the end of the project, this decentralized system should be oriented towards support of the Water User Associations rather than direct action by any one office. A more detailed discussion of the system is found at Annex F, Institutional Analysis. Proposed scopes of work for technical assistance, and proposed training plan, are found at Annex K, Administration/Management.

## 2.4 Conformance with Policy Objectives

Government of Tunisia policy objectives and commitment are discussed in detail at Annex E, GOT Policy and Practice, and summarized in Section 5.1 of this paper.

### 2.4.1 Conformance with AID Policy Objectives

The AID policy paper on Domestic Water and Sanitation, prepared in May of 1982, clearly states that the Agency's program objectives and priorities: "... concentrate primarily on the health rationale for investments in domestic water supply and sanitation". The proposed project includes all of the stated criteria for support in that document:

There must exist a) insufficient water, b) consumption of contaminated water, c) inadequate sanitation systems; and consumers must be willing to a) support recurrent costs through some combination of fees, contributions, and local or national budget allocations, and b) cover some portion of the investment costs to improve traditional systems or build new ones.

The proposed project also conforms to AID's Asia/Near East Bureau strategy, which ranks "water scarcity and utilization" third among Bureau priorities for the period 1983-1988.

Finally, the proposed project conforms to the USAID/Tunis mission strategy, which will be amplified in the upcoming CDSS to focus on:

- Directing resources where there is significant potential for policy dialogue;
- Promoting technology transfer; and
- Further strengthening Tunisian institutions which AID has previously assisted.

As discussed in the preceding sections of this PP, USAID/Tunis' policy dialogue with the GOT on improved management of scarce GOT budgetary resources will be promoted through demonstration of effective user financial contributions to public water supply. The transfer of improved technologies --hydrogeologic, drilling engineering, and management-- is stressed. Emphasis on the institutional development of CTDA is historically important to USAID/Tunis. Emphasis on the private sector throughout, in design, installation and management, is key.

#### 2.4.2 Conformance with Other Donor Strategies

A number of other donors is currently involved in potable water activities in Tunisia. A brief narrative and overview of their activities is provided in Annex R.

### 3. COST ESTIMATE AND FINANCIAL PLAN

#### 3.1 Financial Plan

The total estimated cost for the 5 year project is \$9.89 million, of which \$6.5 million is AID's contribution and \$ 3.39 million is the Tunisian contribution. Grant funding is justified in Annex J, Economic Analysis. The budget is based on a set of standard cost estimates which are attached to Annex I, Financial Analysis, combined with the more detailed costs outlined in Annex G, Technical Analysis. Pro Forma budgets for the proposed contract with a Tunisian A&E firm and the proposed contract for the Water Resources Mapping Study are appended to Annex K, Administration/Management, along with draft Scopes of Work. A standard exchange rate of TD .700 = \$1.00 was used throughout. Foreign exchange (FX) costs and dollar-derived costs were inflated at a rate of 5 percent compounded annually. Local costs (LC) were inflated at the projected Tunisian rate of 12 percent per annum. Varying contingency factors have been included in the detailed budget elements, as well as a modest annual contingency, and therefore a percentage contingency factor has not been included.

Over 37 percent of the non - US input is in the form of operating and maintenance costs paid by the members of the proposed non-governmental Water User Associations. It was felt that this significant private contribution should not be subsumed under an incorrect heading. For this reason the budget tables have been organized as shown.

With the exception of the above-mentioned contribution by the Water User Associations, inputs basically follow the division used during the previous project and no problems with GOT negotiations are foreseen.

#### 3.2 Financial Procedures

Given the lack of an observed problem and the fact that a Spring 1985 RIG Audit found no problems and closed the audit with no recommendations whatsoever, the Project will retain the financial procedures used previously, i.e. the Fixed Amount Reimbursable (FAR) system. Annex S sets forth FAR procedures for the Project.

MAR 17 1986

- 23 -

Table 2  
Summary of Expenditures by Calendar Year

<u>USAID (\$'000)</u>						
<u>Contract Items</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Total</u>
<u>Component: Technology Transfer</u>						
1. Personnel and TA	456	83	52	22	18	631
2. Construction	561	1046	1335	623	402	3967
<u>Comp: Inst. Dev/Reg</u>						
1. Personnel and TA	158	197	114	31	31	531
<u>Comp: Evaluation/Audit</u>						
	--	66	--	166	--	232
<u>Contract Total</u>	<u>1175</u>	<u>1392</u>	<u>1501</u>	<u>842</u>	<u>451</u>	<u>5361</u>
<u>Non-Contract Items</u>						
<u>Comp: Tech. Transfer</u>						
3. Commodities	205	--	--	--	--	205
<u>Comp: Inst. Dev/Reg</u>						
3. Commodities	124	10	10	10	10	164
4. Training	--	51	51	51	36	189
Inflation/Contin.	23	95	184	150	129	581
<u>Non-Contract Total</u>	<u>352</u>	<u>156</u>	<u>245</u>	<u>211</u>	<u>175</u>	<u>1139</u>
<u>Total</u>	<u>1527</u>	<u>1548</u>	<u>1746</u>	<u>1053</u>	<u>626</u>	<u>6500</u>

62

Table 3

Breakdown of Expenditures by Component/Calendar Year  
USAID (\$'000)

<u>Contract Items</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Total</u>
<b>Component: Technology Transfer</b>						
1. Personnel and TA	--	44	22	--	--	66
. US TA: ST x 6pm (4pm elog; 2pm other)						
. Tun TA: ST x 2pm (1 pm PVC casing, 1pm PVC pipe)	--	--	4	--	--	4
. Tun. A&E Firm	29	39	26	22	18	134
. Water Resources Mapping Contract	427	--	--	--	--	427
2. Construction						
. Wells	432	647	540	--	--	1619
. Civil Works	129	258	301	301	301	1290
. Extensions	--	141	304	132	101	678
. NMM	--	--	190	190	--	380
<b>Comp: Inst. Dev/Reg</b>						
1. Personnel and TA						
. US LT 2pm Maint	65	130	65	--	--	260
. US LT 6pm local Org for UAG	22	11	11	11	11	66
. 6pm Health Trg	22	11	11	11	11	66
. 2pm Spatial Analysis (criteria)	22	--	--	--	--	22
TUN LT 2pm Maint	18	36	18	--	--	72
TUN ST Research and/or Trg UAGs (30pm)	9	9	9	9	9	45
Comp: Evaluation/Audit	--	66	--	166	--	232
<u>Contract Total</u>	<u>1175</u>	<u>1392</u>	<u>1501</u>	<u>842</u>	<u>451</u>	<u>5361</u>

MAR 17 1986

162

MAR 17 1986

Table 3 (Continuation)

<u>Non-Contract Items</u>						
Comp: Tech.Transfer						
3. Commodities		--	--	--	--	
. Research equipment	181	--	--	--	--	181
. Vehicles (2pm for RSH field crews)	24	--	--	--	--	24
Comp: Inst.Dev/Reg						
3. Commodities						
. Training Materials for Health Ed	100	10	10	10	10	140
. Vehicles 2pu for Maint rig	24	--	--	--	--	24
4. Training						
. US or 3rd Country ST x 63pm	--	51	51	51	36	189
Inflation/Contin.	23	95	184	150	129	581
Non-Contract Total	352	156	245	211	175	1139
Total	1527	1548	1746	1053	626	6500

MAR 17 1986

- 26 -

Table 4  
Summary Expenditures by Source/Calendar Year  
GOT and Other Contribution (\$'000)

GOT Component	1986	1987	1988	1989	1990	Total
<u>Technology Transfer (Tot.)</u>	146	213	250	271	295	1175
1. Personnel and TA	75	75	75	75	75	375
3. Commodities	51	102	119	119	119	510
5. Other	20	20	20	20	20	100
Inflation	-	16	36	57	81	190
<u>Institutional Development</u>						
<u>Reg. (Tot.)</u>	139	181	202	220	269	1017
1. Personnel and TA	60	90	90	90	90	420
3. Commodities	59	1	2	1	38	101
4. Training	--	51	51	51	34	187
5. Other	20	20	20	20	20	100
Inflation	-	19	40	63	87	209

2/2

MAR 17 1986

Summary Expenditure by Source/Calendar Year

<u>Other - WUA Component</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Total</u>
<u>Institutional Dev:Local(Tot)</u>	144	183	231	287	353	1,198
5. Other - WUA input for O+M for Water sytems	144	164	184	204	224	920
Inflation		19	47	83	129	278
<u>TOTALS</u>	429	577	684	783	917	3,390

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Table 5

Breakdown of Expenditures by Component/Calendar Year

<u>GOT (\$'000)</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Total</u>
Component: Tech Transfer						
1. Personnel and TA						
. GOT staff						
AHA	45	45	45	45	45	225
Other	30	30	30	30	30	150
3. Commodities						
. Pump sets 17,000	51	102	119	119	119	510
5. Other: POL, Taxes, etc	20	20	20	20	20	100
Sub-Totals	146	197	214	214	214	985
Inflation* 5 or 12%	--	16	36	57	81	190
Component Total	146	213	250	271	295	1175

\* / 5% inflation factor is used for a pumpsets purchased abroad; 12% for in-country costs

MAR 17 1986

811

MAR 17 1986

Breakdown of Expenditures by Component/Calendar Year

<u>GOT (\$'000)</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Total</u>
Component: Inst Dev Reg						
1. Personnel and TA						
. GOT staff						
UAG	30	60	60	60	60	270
Other	30	30	30	30	30	150
3. Commodities						
. UAG Equip/Mat	17	1	2	1	2	23
Vehicles						
. ILR, 1 sed'86 UAG	30	--	--	--	--	30
. 3 sed'90 UAG	--	--	--	--	36	36
. 1 pu health'86	12	--	--	--	--	12
4. Training	-	51	51	51	34	187
5. Other: POL and Taxes	20	20	20	20	20	100
Component Sub-Total	139	162	163	162	182	808
Inflation	--	19	40	63	87	209
Component Total	139	181	203	225	269	1017

MAR 17 1986

Breakdown of Expenditure by Component/Calendar Year

<u>Other - WUA Component</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>Total</u>
<u>Institutional Dev/Local</u>						
5. Other	144	164	184	204	224	920
. O+M for Water sytems						
Inflation (12%)	--	19	47	83	129	278
Component Total	144	183	231	287	353	1198

40

AID financing of other local cost elements, e.g. the Health Education component, will be based on Direct Reimbursement procedures as outlined in AID Handbook 14. In this regard, it is important that changes to the proposed budget be negotiated with the CTDA or other implementing agency (Public Health) no later than May of each year to enable them to include changes in the subsequent year's GOT budget. The CTDA, with an autonomous budget, has more flexibility than does the Directorate of Public Health, but both have requested that AID attempt to co-program with them where possible. Local costs for 1986 will have to be advanced by the CTDA, and covered by a supplemental request from the Directorate of Public Health because the 1986 budget requests had been made and forwarded prior to project design.

#### 4. IMPLEMENTATION PLAN

Figures 4 and 5 represent a summary of key implementation actions over the 5 year life of project. The first year has been illustrated in detail; subsequent years note an indicative flow of repeated actions.

Annex G, Technical Analysis, and Annex F, Institutional Analysis, provide the rationale for and detailed description of the project components. Annex K, on Project Administration and Management, provides detail in the form of : a) a Procurement Plan; b) Draft Scopes of Work for proposed contracts and short-term TA; and c) a Training Plan.

Section 6 of this PP provides guidelines for AID and CTDA monitoring and evaluation activities, and Section 5.9 summarizes their respective roles. In terms of roles and responsibilities of the two key agencies, few changes from the previous project procedures or norms are proposed.



IMPLEMENTATION PLAN — 1986 and 1987 (continuation)

MAR 17 1986

ACTION	DATE	1986										1987								
		APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE	JULY			
<u>C. Institutional Development:</u>																				
<u>Local Level</u>																				
1. Interim status accorded WUAs		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX										XXXXXXXXXXXXXXXXXXXXXXXXXXXX								
2. Organization regularized												Existing Sites      New Associations								
o Officers chosen		XX																		
o Accounts management established		XX																		
o Training needs established		XX																		
<u>D. Institutional Development:</u>																				
<u>Regional Level</u>																				
1. Water Resources Study	SOW																			
o SOW analyzed	xxxx	Signed																		
o Contract signed (direct AID)		XXXXXXXXXXXX																		
o Maps complete/26 sites proposed for new wells;		XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX																		
2. Criteria Revision												Spatial Analysis								
o TA provided (2pm)												XXXXXXX								
o New criteria for wells & extensions mutually agreed												XXXXXXXXXXXXXXXXXXXXXXXXXXXX								
3. Unité d'Autogestion		Created																		
o created & positions authorized		XXXXXXXXXXXXXXXXXXXX																		
o staffed & equipped												Staff selected								
o 1986/87 workplan developed by TA assistance												TA			Staffed & Equipped				TA	
												XXXX			XXXXXXXXXX				XXXX	
4. Public Health activities																				
o TA for A-V materials and training plan												TA							TA	
												XXXXXXXXXX							XXXX	
5. Maintenance	SOW																			
o TA SOW finalized	xxxx	XXXXXXXXXX																		
o TA in Kasserine												TA							XXXXXXXXXXXXXXXXXXXXXXXXXXXX	

IMPLEMENTATION PLAN 1987-1990

MAR 17 1989

Action / Date	1987	1988	1989	1990
<u>E. Technology Transfer</u>				
<u>Local level A&amp;E</u>				
1. Water well construction 1987-12 1988-10	Monthly Review and Report			
2. Well point civil works (27)	Monthly Advise, Monitor and Report			
	xxxxx Design 1 mo.	xxxxx Design 1 mo.	xxxxx Design 1 mo.	xxxx Design 1 mo.
3. Extension water points (4)	Monthly Advise, Monitor and Report			
	xxxxxxxxx Design 2 mo.	xxxx Design 1 mo.	xxxx Design 1 mo.	
4. NMM systems (2)	Monthly Advise, Monitor and Report			
	xxxxxxxxx Design 3 mo.	xxxxx Design 1 mo.		
<u>Institutional Develop.</u>				
<u>Local level</u>				
Training				
. Study tours for Committee Members	xxxxxxxx	xxxx	xxxx	xxxx
. In-country for WUA	xxx	xxx	xxx	xxx
. Presidents				
. Treasurers				
. Pumpist				
. Tunisian s-t TA Trainers	xxx	xxx	xxx	xxx
<u>Institutional Develop.:</u>				
<u>Regional Level</u>				
. TA Local Orgs	xxxx	xxxx	xxxx	xxxx
. TA Public Health	xxxx	xxxx	xxxx	xxxx
. TA Maintenance	xx US Advisor Departs			
	xx	xxxx	xxxx	xxxx
	Tunisian Advisor Continues Short-Term TA			
<u>Evaluation</u>	April/May xxxxx		April/May xxxxx	

44

## 5. SUMMARIES OF ANALYSES

### 5.1 Policy Analysis

Government of Tunisia policies allow for all actions contemplated under the project, and specifically support resolution of a number of concerns identified by AID.

All GOT policy towards fresh water is founded in the 1975 Code Des Eaux (Water Code), which is a formal national law signed by the President in 1975. The Code reaffirms all existing decrees that pre-date it unless specifically excepted in this new version. This law includes a definition of "water in the public domain" and specifically of "water for human consumption". The Code specifies protective measures for the conservation of water, and provides for the periodic establishment of standards for "potable" water. It also includes provision for the creation of "User Associations". Although the elaboration of the Code chapter on these Associations assumes they will be for irrigation, most people involved in the proposed project design concur that this can serve as the legislative foundation for the Water User Associations to be formed under the project.

Through the Code, responsibility for all water is vested in the Ministry of Agriculture. The Minister thus has the authority to sign statutes further defining provisions of the Code, rather than having to pass everything to the Parliament and the President. The Rural Development Division of Genie Rural in the Ministry of Agriculture is, in fact, currently working on the elaboration of a statute to support potable Water User Associations.

One relevant law which pre-dates but is reaffirmed by the Water Code is the one which established SONEDE in 1968. This law establishes the precedent of citizens paying for potable water. Subsequent amendments have established differential rates, so that small residential consumers are paying the actual administrative and energy costs of obtaining water, while large consumers (i.e. the tourism sector) pay more to subsidize capital investment. Application of this precedent--while probably not consciously done--is evident in rural Kasserine. Some of the new Water User Associations there are charging people with large cisterns and tractors who use water for economic gain more than simple household consumers. Concerned administrative officials in Kasserine support this differential structure.

45

GOT commitment to the stated policies is generally strong as evidenced by major budgetary increases in the Sixth Plan for rural potable water. The GOT is contributing more than \$ 50 million to complement a \$ 50 million IBRD loan to extend SONEDE activities into rural areas. Performance in financing maintenance on public systems outside of SONEDE is not as evident, although a paucity of information may be part of the problem. In Kasserine, the Governor's Council budget, which provides for operation and maintenance of rural public water systems, has not been adequate for several years and funds targeted for the creation of new water points have had to be diverted to maintenance.

Actions underway in Kasserine and the concurrent Genie Rural administrative work suggest that the policy of having rural people cover the annual operating and maintenance costs of water systems in rural areas is almost a fait accompli. Much more work needs to be done, however, to establish how much beyond the operating costs they can and will be able to cover. Most of the systems are new and repair costs to date have been minimal. AID and CTDA are encouraged to follow the monitoring guidelines at Section 6 to ensure informed resolution of this question.

Based on this analysis, Section 7 of this PP recommends inclusion of a Condition Precedent in the Grant Agreement providing for interim official status of the WUAs on an experimental basis. The Governor of Kasserine has said he is willing and able to sign such an order, as long as it is considered "experimental". The issuance of such an interim order will allow the WUAs to function while experience is gained on just what a subsequent national law or decree should include. Conversations with officials in Sened and North Gafsa suggest these delegations are also committed to cost recovery and would consider the establishment of WUAs to achieve this.

## 5.2 Institutional Analysis

Participants and observers alike agree that there appears to be institutional redundancy, competition, and inefficiency in the provision of potable water supply in Kasserine. As illustrated by Figure 2 in the PP, 4 separate agencies--SONEDE, Genie Rural, CTDA and the Programme de Developpement Rural (PDR)--are all responsible for installing new systems. The PDR receives financing from the Governor's Council to maintain all systems, under technical guidance from Genie Rural. All of these

implementing agencies are dependent upon Direction des Ressources en Eau (DRE) for guidance in site selection and issuance of permits to dig or drill wells. DRE itself does not implement, it simply signs work orders for one of a number of drilling companies to proceed. The different implementing agencies all have slightly different criteria for site selection and slightly different technical standards, often dependent on their source of financing. Organization of the potable water supply system in Kasserine is, in fact, confusing.

Given this basic perception, the team was directed in its Scope of Work to undertake an institutional analysis and "provide guidelines for creating, staffing and supporting a regional service responsible for planning, operating and maintaining water systems". The analysis was undertaken, and the following conclusions were drawn:

- Rural Tunisia is in a structural transition period regarding rural water supply, and a new regional service is not indicated at this time. As already noted, SONEDE is pursuing a strategy of taking over rural water supply between now and the year 2000. The creation of a new service outside the SONEDE strategy would be an extremely inefficient use of human and financial resources. The project aim might thus be modified to provide a more efficient use of these resources until SONEDE is fully staffed. Moving project administration to SONEDE is an option, but does not meet current USAID/Tunis strategy for a number of reasons.

- The current system is in fact not particularly inefficient given the context in which it operates. Each of the 4 implementing agencies respond to a different client group. Genie Rural and PDR install systems based on demographic criteria and political expediency. SONEDE needs to cover its costs, and thus can currently only work in clustered communities. CTDA, with AID funding, is able to balance the political with a more sincere attempt at objective criteria. Given the environment, then, the planning function is being well served by this mix of diverse interests.

- "Planning" is also understood to mean improved scheduling of installation of systems. Here, a time-budget analysis (cursory though it was, due to time) was undertaken to identify the bottlenecks. Major findings were that an inordinate amount of down time on drilling rigs is due to poor communications; and that the paperwork burden of construction and equipment contracting was

detracting from the CTDA ability to monitor ongoing work. The proposed project recommends a number of mitigating measures to improve communications, decrease work burdens and improve planning and scheduling.

- A new water-related service might be justified in terms of structure and function (i.e. efficiency) if it includes a planning function for agricultural as well as potable water. The aforementioned Water Code specifically separates the two, as does the government, both bureaucratically and technically. At this time, water for irrigation in Kasserine is subject to a number of potentially contradictory "policies", depending on the funding source for the program. The people, of course, are not aware that the water they use is designated as one or the other, and thus use it for many things. DRES is performing capably in regulating agricultural and potable water from a hydrologic and conservation standpoint.

- The major institutional innovation proposed in this project is the development and reinforcement of the nascent Water User Associations currently being created in Kasserine. Proposed functions of the WUAs are enumerated at Section 2.3.2 of the PP. The Associations are viewed in the long-term as semi- or perhaps fully autonomous, non-governmental organizations. In order to strengthen the likelihood of their evolution to this status, focus should be on providing the means to carry out these functions. Financial authority, with postal or bank accounts managed by an Association itself, is one means. A strong and continuing emphasis on skills acquisition through training is another. The ceding of financial responsibility to the WUAs for operations and maintenance of water points without the ceding of authority or the provision of training would most certainly lead to failure to achieve the project purpose.

- Support of the Associations for these needs is a new function for which a new small office is proposed. The CTDA will create a new Unit or Division called in this paper the "Unite d'Autogestion" (UAG). An initial staff of four persons with social science background is proposed, one of whom will focus almost exclusively on training. Although a number of options were considered, it appears appropriate, with CTDA agreement, that this office should have separate status and report directly to the PDG. The office will be reinforced through the repeated visits of a short-term consultant with extensive experience in participation in rural water supply management, and through an ample budget for provision of Tunisian consulting expertise in training. As demonstrated in the Economic Analysis, the recurrent costs of this office are far below the benefits it is expected to generate and sustain.

- Creation of linkages between and among the different organizations involved in the support of the WUAs is the most critical issue of the project. These linkages involve both better information flow and cooperation among the technical services described in paragraph 1 of this section as well as between and among the WUAs, Local Potable Water Committees, the Regional Potable Water Committee, and the Unité d'Autogestion. Equally critical will be improved linkages between the Unité and the technical office in CTDA, the AHA. The proposed Local Organizations consultant will facilitate some joint programming exercises with these organizations. Much will necessarily depend on the personalities and leadership in these organizations. AID and the PDG are encouraged to monitor relationships, and to be prepared to intervene if conflict arises.

- The Health Education component is a potential problem in that the funding flow is outside of the CTDA and responsibility thus rests fully with the Directorate of Public Health in Kasserine. Relations between CTDA and Public Health are currently good, and Regional and Local level health personnel have been active committee participants. Provision of a short-term consultant for assistance in Health Education at the same time as the consultant in Local Organizations is proposed as an artificial pressure to help force, if necessary, joint programming.

In sum, the design has not resulted in a recommendation for a streamlined, vertically integrated institution to do everything for water supply in rural Central Tunisia. It has taken what exists and has provided for strengthening both current performance and long-term capacity, particularly of the Water User Associations. While not institutionalizing a new water service, this appears to be the most practical and cost-effective way to proceed.

### 5.3 Technical Analysis

The proposed project builds on the momentum of the JTRD Rural Potable Water Project. The previous project, in the technical sense, was concerned with development of springs, emplacement of shallow dug wells and the construction of wells to 200 m. The proposed project is expected to include the construction of an additional 30 bored wells, four water point extensions, two individual house connection New Mexico Model systems (NMM) and a materials and procedures research element.

The proposed project is to include a Water Resources Mapping Survey that matches populations, and various social and geographical features with potential water resources (ground water). This is to be done to refine over-all project criteria and define locations for rural potable water interventions. The resources evaluation will be extremely important since current criteria are loosely defined and no specific locations for wells, extension systems or NMM have yet been determined.

#### Water Well Construction:

A single typical water well design has been formulated for the 30 wells to be constructed during the Project. The design is similar to that of one type commonly constructed in Tunisia. It offers a wide range application to hydrogeologic environments, can be constructed using the project Ingersoll-Rand TH-60 Drill rig, and can incorporate the use of steel or PVC well screens. Further, Tunisian drilling organizations currently possess the tooling required to construct such wells.

The rate of well construction, considering long term practices, can be improved by providing the project with immediate access to electric logging equipment, better communications, more proper use of the project TH-60 Drill rig, and on-site water quality and quantity monitoring during test drilling. An important factor in accelerating the well completion rate, i.e., rig months/well, will be improved responsiveness of concerned Tunisian Governmental Agencies to well site requirements.

Well pumps, drive units and head works furnished to the project by the GOT are frequently over designed for normal rural potable water requirements. Consideration should be given to limiting well production specifically for rural water supplies to 5 L/S, thus reducing equipment, maintenance and operations costs.

#### Civil Works Facilities:

These facilities are primarily related to water points where wells are constructed and extension water points are to be placed. Such facilities include:

- o Pump houses
- o Reservoirs
- o People water points
- o Animal water points
- o Facilities connective piping and fixtures

Up to 30 of these water points are scheduled for completion under this project. During field studies in the Kasserine vicinity a number (more than 15) of civil works facilities were visited and evaluated. On-site analyses indicated that a general improvement of site arrangement (spatial) and minor modifications to individual facilities could improve site drainage, sanitation, safety and control for little or no additional cost.

Maintenance and reliability of water points will be of tantamount importance in obtaining social and institutional objectives of the rural potable water project. Review of maintenance procedures and visits to repair facilities indicate that current activities will require significant assistance in upgrading organization and operations functions in order to service the more than 120 water points projected to participate in the CTDA program.

#### Water Point Extension Systems:

Four types of water point extensions were observed in the Kasserine vicinity:

- 1) Rural
- 2) Fringe-Agglomeration
- 3) Rural-Agglomeration
- 4) Extended-Extension

Each of these types has unique population served criteria and design variations, types-1, 2 and 3 appear to meet general project criteria, while type-4 does not. Four extension systems, one type-1, two type-2, and one type-3, are proposed for the present project .

#### Individual House Connections Model (NMM):

Two NMM water systems are proposed to be included in this project . Basic off-site and site-specific design criteria for such systems have not yet been formulated. Only generalized design concepts and social criteria for the project NMM are available. Only when locations for the NMM are determined can such site-specific items as system configuration, hydraulics, operation and design be established. However in order to produce cost estimates for the NMM several assumptions were made regarding design features. Among these are:

- NMM will be constructed to the reservoir of an existing well water point.
- The NMM service area will have a square or rectangular configuration within a 1/2 kilometer radius.
- The NMM will be within a four Km radius of a well point source and serve an agglomeration (village) of at least 50 dwellings.

Proposed Research Activities:

The project research element is designed to cautiously integrate new technology and materials with the other major project objectives. Introduction of theoretically better technology which is, in reality, not regionally appropriate would result in highly negative impacts on the over-all project. Thus, the research element is designed to be more oriented to evolution than to dramatic change.

Well construction:

Research in this area is proposed to improve rates of construction and success-to-failure record for wells attempted. Further, PVC is proposed to be used in screened sections of four wells to institute and test the feasibility of such installations. At this time Tunisian drillers have no experience with such materials.

Modifications in drilling procedures and bore hole logging are also recommended for testing with the TH-60 drilling rig.

Pipeline Alternative Materials:

Discussions with Tunisian authorities and a literature search indicates that asbestos-cement (AC) pipe is now used almost exclusively in rural public water systems and extensions. Further comments related to the use of PVC pipe in irrigation systems indicated such pipe was subject to splitting or cracking during handling and frequently developed leaks at couplings. No other materials than PVC and AC are considered cost effective in the diameters required for project facilities.

For purposes of research and testing, it is proposed to install PVC piping of a suitable pressure rating in portions of one extension water point pipeline and one NMM distribution system. By this method actual installation costs, techniques, and applicability can be compared for AC versus PVC piping in similar construction environments. Further, neither the test extension system nor NMM system is totally jeopardized if a test fails. If the research proves PVC pipe to be applicable and actually cost effective, its use could be adopted for future facilities.

6/2

Key items in the successful completion of the technical aspects of this project will be an expeditious completion of the proposed project resources evaluation study, early purchase/arrival of the electric logger, prompt identification of facilities/construction sites and last, but most important, vigorous cooperation of all parties and agencies concerned with the project.

#### 5.4 Social Analysis

The project proposes to introduce a number of new water points in the Central Tunisia area, and to introduce a new institutional pattern in both the new and old (previously existing) water points.

The people who will benefit most from these interventions are the dryland farmers, generally speaking the poorest category of the Central Tunisia population. For historical and economic reasons, the settlement pattern of the dry land farmers in this area is one of extremely scattered dwellings, thus making provision of such services as potable water difficult. The traditional water points (springs and ancient wells) have recently been supplemented by an array of new wells, both privately dug, shallow, multipurpose wells and drilled wells created by the State, in some key cases with the assistance of USAID. Despite the array of water points, large numbers of the population must travel a considerable distance daily in search of water, or must pay a tractor owner to haul water from a distant water point. Those who seek water themselves characteristically use donkeys, either carrying a pair of 20-liter containers across their backs, or pulling a small 500-liter tank. The water haulers are a mixture of men, women and children, according to the availability of family members, the distance and mode of transport, and the atmosphere at the water point itself. Water is used at home for cooking, drinking, and washing of clothes and kitchen and eating utensils. Most farmers use some of the same water for watering their flocks of sheep and goats, and occasionally to support a small home garden. Thus women control the most critical uses of water: drinking water for animals and humans, cooking and washing. Water is important not only for household use, but also for income generating purposes.

Analysis of the 1984 census suggests that the size of the beneficiary population in Kasserine and the two northern delegations of Gafsa is approximately 100,000 people, when projected SONEDE activities over the term of the project are included. In Kasserine governorate, the 1984 census revealed that 71% of the rural population relied on public water points for their potable water, and that 46% of these felt that they

63

were "very far" from the nearest water point. Many of these water points still have substantial public health problems due to excess water and animal excrement; engineering can solve the problem partially but in the end it will require human intentionality.

The institutional innovation suggested in this project is the Water User Association. Water User Associations will have several tasks, notably the autonomous management of the water points, the maintenance of the water point in a healthy condition, the diffusion of information about health and sanitation, and the organization of water use patterns around the water point. The basic function is the first one, which requires people not only to work together but also to collect and spend money in order to cover the running costs of the water point. These associations will have a managing committee of some kind, led by officers and in liaison with a new office in the Central Tunisia Development Authority in Kasserine.

Considerable progress towards the creation of an effective network of Water User Associations has already been made. There is now a Regional Potable Water Committee in Kasserine, and a Local Potable Water Committee in each of the delegations participating in the previous project. In CTDA's current area of operation of the CTRD Potable Water Project (Kasserine, Siliana and Sidi Bou Zid), some 150 different water points now have at least a semblance of a site-specific Water User Association. The task that must now be done is to work with these nascent Water User Associations to render them capable of effectively managing their own water points, from the health and community as well as from the financial and maintenance points of view.

There are some interesting experiments in the Central Tunisia area which can serve as a model for the new Water User Associations. There are some 30 recently formed agricultural service cooperatives in Kasserine, and there are two successful experiments undertaken by the Save the Children/Community Development Foundation (SCF/CDF). Contrary to the reputation for independence and individualism of the people of this region, it is clear that collective efforts can be sustained, when the conditions are right.

Certain problems are perhaps foreseeable. (1) The rules for determining the membership of the association must be specified. (2) Each association will have to determine how to fix its rates for water. (3) Local leadership patterns will have to be managed so that effective leaders come forward.

64

(4) The role of rural government officials must be determined, and the balance between the role of the State and the role of the population laid down loosely but firmly. (5) At the moment, most local committees are likely to consist only of adult males, yet women are among the principal water users; some method for ensuring their participation has to be worked out.

The prognosis for the successful adoption of the water user association model in Central Tunisia appears to be good. People are willing to make a reasonable contribution in money and in labor to secure potable water for themselves and their families. Issues of equity, leadership, self management, the role of women, cannot be solved in a short time. Their resolution will require considerable imagination and tolerance on the part of all concerned.

There are several ways of calculating the economics of water point self management. Although disposable income in Central Tunisia is not high, it appears sufficiently high to enable people to make the kind of payments that are necessary (perhaps on the order of 1 to 2 dinars per household each month). Larger users, presumably those who are using the water for economic income-generation purposes, will pay more --at least this is the sense of fairness that people in the region express. At the moment, the proposal is that the Water User Associations should assume responsibility for paying the pump operator, and purchasing all the fuel and oil the water point motor would need. They will also be responsible for small repairs, whether because the pump operator can do them himself, or because the association seeks out a private repair person in the nearby town. Second level repairs will be financed by the government, as at present, but the Association should take on the task of locating the repair crew (perhaps even the government one) and making sure the job is carried out. It is estimated that the monthly budget for each water point will not exceed TD 300.

Current costs of water in the countryside will be considerably reduced if this plan is enacted. Those who pay cash for water now pay an average of around TD 2 per cubic meter (compared with TD 0.080 per cubic meter for the first 20 cubic meters in the SONEDE rates). An opportunity cost analysis of those who expend only labor to haul water suggests that the "real cost" to them might be even higher than the amount charged by water vendors. At the same time, the costs of these water points to the government will also be reduced.

By and large the people of the "thirsty zones" of Central Tunisia appear to be ready, willing and able to pay a cash contribution towards the self management of their water points, and to contribute labor and time toward this end.

One of the more innovative suggestions that has been made in conjunction with this project is to create one or two areas of experimental house hookups with inexpensive materials, but with water use paid for, and managed by a Water Users Association. This model can be applied, in this experimental phase, in areas where house distribution and terrain allow a reasonably good chance of success. The Water User Association here would require a few extra skills (such as reading meters if meters are to be installed and collecting bills), but it would otherwise be substantially the same as the other associations.

The development of a better system for providing potable water to the residents of the areas of Central Tunisia not yet served by a modern system would have beneficial effects on the local economy. It would encourage people to remain at home rather than move their families to the cities, and it would do so by giving them increased economic incentives to remain in the rural sector. Women and children, as well as men, will gain extra time, which could be devoted to schooling or income-generating activities according to the case. The situation in Central Tunisia has improved, due to the attention paid to it by development agencies and the energy and creativity of its own people. But there are still poor areas, areas suffering from a lack of potable water, areas with old-style agricultural technology or where water-borne diseases are relatively common. More remains to be done before the economic and social gap between Central Tunisia and the more prosperous areas along the coast can be reduced significantly.

### 5.5 Financial Analysis

The proposed project of \$ 9.89 million is composed of technology transfer (creation of water points), and local and regional institutional development. The component creating water points totals \$6.4 million which, when divided by the minimum number of water systems to be created, comes to \$213,000 per system. Assuming the average site will service 300 households of 5.6 persons each (1680 people), the average capital cost per direct beneficiary will be about \$125. This is considered reasonable under the conditions existing in rural Central Tunisia. Throughout the project the least cost solutions to technical problems will be sought.

56

Furthermore, the beneficiaries of these wells and the other already existing public wells will make payments sufficient to cover the operation and maintenance of all the wells. This fee will be affordable to the local population, and in many cases will be less than they are paying for water at the present time. Thus once AID financing ceases, there will be relatively little demand for further GOT expenditures for these water points, with the exception of a minor portion of the CTDA budget.

The financial effect of the proposed project on its beneficiaries is difficult to quantify. It is likely that greater access to water will result in small increases in the size of farmers' herds and in some cases the creation of small garden plots. The social benefits referred to in the economic analysis will also no doubt lead to a certain increase in productivity. This, however, will not lead to major increases in rural incomes. The major impact will be a considerably enhanced quality of life for the rural population of Central Tunisia.

Concerning the financial viability of the project, an analysis of the CTDA budget over the years 1979-1984 indicates that the proposed project will not put undue pressure on CTDA. During 1988, the year of estimated "peak" expenditure under the project, the additional funds would represent at most only 25 percent of CTDA's total budget (See Table I-1).

At the moment the Water User Associations are new and unproven, but indications based on those that are now operational suggest that they can and will operate efficiently. It is estimated that 85 percent of the WUAs will obtain 100 percent cost recovery. Precise operating and maintenance costs for several water points could not be obtained to serve as examples. Total 1984 budgeted costs (given available data) for the 40 wells operated by the PDR amounted to TD 93,800. (See Annex I Financial Analysis for a breakdown of these costs).

By increasing the number of wells by 30, the total cost estimate for the 70\* wells at the time of project completion would be on the order of TD 164,150 for an average annual operating and maintenance cost of TD 2,345 per well. This works out to approximately TD 195 per month. In spite of the relatively low level of disposable income in Central Tunisia, the project appears to be affordable to its beneficiaries.

\*/ Includes 30 new USAID-funded and an estimated 40 wells operated by PDR.

5/1

On the other hand, full cost recovery of the operating and maintenance costs of these water points represents a real saving to the GOT. It has therefore been included in the project budget as a host country contribution to the total cost of the proposed project.

For those few WUAs unable to recover operation and maintenance costs fully, the GOT will of necessity have to make minor subventions. It is anticipated that as the system gains general acceptance throughout the region, these subventions will decline proportionately.

Each WUA will need to handle its accounts through a financial institution. The two options are the banking system and the postal savings system. The WUAs will probably prefer to open accounts at local post offices, since these are far more numerous and offer 6.5 percent interest on current balances. Each WUA will make its own decision on this matter.

#### 5.6 Economic Analysis

The volume of water available in Tunisia is limited. As of mid-1982, about 91% of Tunisia's urban population had access to potable water while in rural areas only about 46 percent had such access. GOT policy envisages a massive commitment to improving access to water in rural areas by the year 2000. The GOT is giving priority to developing the less favored regions of Tunisia and the project area is one of these. It strongly supports any effort to reduce existing inequities, in particular those which will improve their quality of life. Potable water is a basic need for a healthy and productive population. The project being proposed is designed to meet this most basic of human needs.

One of the objectives of this project is to introduce the concept that rural inhabitants should pay for water which they have previously received free of charge. Recent social analyses indicate this solution is acceptable to the vast majority of inhabitants, many of whom pay professional water sellers more than they would pay under the proposed project. Others spend as much as 6 3/4 hours each round trip to a water source with an average of 16 trips a week in the summer.

Due to the rapidly mounting financial burden of providing social services (including potable water) at free or below-cost delivery, the GOT is reviewing the cost structure of these services and is considering the introduction of some user fees. It is anticipated that all users of water from project wells and from approximately 40 existing motorized government water points in the project area would pay for this water.

65

Water is essential for sustaining life, and a potable water supply is a basic service which all governments must make available in cities and villages. Many benefits derive from such projects, benefits to society at large. The many health and environmental benefits that the proposed project would generate, such as reduced expenditures for health care, lower infant mortality, workers' higher productivity, improved learning by children who would have to devote less time for carrying water, womens' higher productivity, would produce a high economic return on the proposed investment. These kinds of benefits are, however, difficult to quantify, and a meaningful economic rate of return cannot therefore be calculated.

Therefore the application of a cost-benefit analysis appears more appropriate and requires delineation of the benefits and costs of the proposed investment in economic terms. Due to the high cost of investment for each beneficiary and due to the new policy initiative of making beneficiaries pay for their water, the assumption is being made that the capital cost of the project equals the unquantifiable social benefits. Therefore cost recovery would be limited to the recurrent costs of operating and maintaining all the public motorized wells in the Governorate of Kasserine, including some "first level" repairs to be specified during the first two years of the project. Replacement of non-functioning pumpsets by WUAs is not foreseen during this project period.

While the project does not lend itself well to cost-benefit analysis, some economic indication of the project's viability can be estimated by calculating what is needed to generate a reasonable return on the project's recurrent costs. As discussed in Annex I Financial Analysis, recurrent cost estimates available are only indicative because so many of the wells are new and have yet to encounter significant maintenance costs. The data which are available, however, (TD 2,345/well/year) can be used as indicative of all operating and some "first level" maintenance. With the opportunity cost of capital for Tunisia estimated to be 15 percent, a 15 year life of project was assumed. Present GOT policy calls for SONEDE to provide all water to rural areas by the year 2000. It is assumed that, at a minimum, the proposed project would add an additional 30 public water points to the approximately 40 motorized points already in existence. Benefits are expected to begin in the first year with the final water points becoming operational at the end of the fifth year. In all cases the least cost solution to a technical problem will be utilized.

The result of this exercise implies that the project needs to generate almost \$450,000 annually in benefits in order to be considered a viable economic initiative. On the assumption that there will be a minimum of 70 water points with functioning WUAs and system of user fees, each servicing approximately 300 households, the monthly contribution required to meet the annual cost of maintaining the wells would be on the order of Td1.250 per household per month. This fits within the range of affordability. While this assumes a payment rate of 100%, it also excludes extra charges for large water users, and so the WUAs should have little if any problem in meeting recurrent project costs. The project budget reflects the substantial benefits received from the beneficiaries through their monthly payments for water service and the resulting savings to the Government to be utilized for other high priority expenditures.

The high social and political priority of the proposed project argues for grant financing. Referring to the criteria set forth in STATE 178281 dated 12 June 1985, the social benefits are broadly diffused, and in this case full cost recovery is clearly not practical. The innovation that beneficiaries will pay for recurring costs is a great step forward on its own. This is a demonstration project that may well be copied throughout the country should it prove successful. So far every indication suggests that it will be successful. Furthermore, there is a level of risk in that some of the wells drilled may not produce potable water or any water at all, and also that the Water User Associations may not prove replicable elsewhere.

At the same time, AID has been active in the Kasserine Governorate since 1977 and has a strong proprietary interest in its economic development. For these reasons it wishes to exercise substantial leverage on the proposed project's implementation and results. Needless to say the collection of fees for potable water is politically sensitive in Tunisia, particularly in light of the civil unrest of the last 10 years following various GOT efforts at lifting subsidies.

#### 5.7 Environmental Analysis

A memo from the Environmental Coordinator, AID/NE, of May 20, 1985, has raised certain environmental issues connected with this project. This section addresses those issues, and others.

- (1) One set of issues concerns the need to maintain healthy and sanitary conditions around the water point site itself. The proposed project deals with those issues, and a discussion is found in Annex H. It is proposed that the

Water User Associations, in liaison with the Autogestion Unit of the CTDA and local health education officials, will handle these problems as part of the continuing necessity of maintaining healthy conditions and ensuring potable water.

(2) The state of water resources in the Central Tunisia area has to be constantly monitored to ensure that use of water does not draw down the water table. The Tunisian Water and Soil Resources Directorate (DRES) is very careful in allowing the construction of new wells, and all wells proposed in this project will have to be approved by the DRES. See Annex E, Section 1 on the Tunisian Water Code.

(3) A final set of issues concerns the likelihood that increasing the water supply will lead to an increase in the number of sheep and goats, thus putting pressure on pasture.

There are currently several constraints on the size of herds:

- (a) availability of water, especially in the summer time;
- (b) availability of pasture;
- (c) management issues and in particular the availability of family labor for herding.

At the moment, it appears that the dominant constraint on herd size is the availability of drinking water for the sheep and goats. (One of the purposes of the original project was to provide water for animals as well as for humans). It is therefore important to ask whether increased water will lead to deterioration of range land in the Central Tunisia area.

The best informed opinion is that this will not be the case. Members of the Oregon State University team working on the CTRD Range Development Subproject were consulted during project development. Their feeling was that as long as herders are not migratory (and they are not true transhumants), then the flock size will be calibrated to the availability of pasture through local herding management practices. The number of sheep may increase with more water; it will also increase with improved pasture due to higher rainfall, or to higher prices in the market. At the same time, degradation may occur for a number of reasons, of which absolute increase in flock size is only one. The Tunisian herder is following a definite strategy, in which an improvement of the availability of water would ease certain constraints, but it would not lead to a totally different herding strategy.

Nonetheless it is important for this project to ensure that its interventions are not leading to negative developments in this area, i.e., to an increase in flock size beyond the ability of the pasture to sustain it. The first triggering mechanism would be a remarkable increase in flock size. Officials at the Range Development Subproject have indicated a willingness to assist in this. The Range Development Subproject is currently working at several sites in the zone to be covered by this project (Sbiba, Foussana, Hassi el Ferid), which should make this cooperation easy.

### 5.8 Energy Use and Production

The proposed project is a relatively low technology program which uses, overall, rudimentary energy systems, i.e., varied sizes of diesel engines at individual water well sites. Engine sizing is dependent upon the total dynamic head required to deliver water from specific optimum pumping levels to specific storage reservoir elevations (including piping friction losses). Selection of drive units (energy consumers) for each individual water well can be determined only after each well is drilled and tested, although for practical purposes of standardization, power units will probably fall into three or four horse power categories. The diesel drive units will be selected and provided by the GOT.

Power options: Because of the remoteness of the potable water supply wells to be constructed, factors of dependability, low levels of maintenance capabilities and mandatory simplification of operations, there appears to be no rational option other than diesel engine drives for well pumps. However two former project well sites visited were equipped with GOT purchased diesel electric generating units. These units (French origin) are being used to drive submersible pumps with a capacity of 30 liters per second. Information obtained from CDTA indicates that it is probable that some additional project wells will be equipped with similar diesel electric units.

Energy Efficiency: Low energy efficiency is an expected characteristic of rural potable water supply projects in locations remote from high power, electrified networks. No such network exists or is reasonably accessible in the locations of project wells. Further, project energy efficiencies will be dependent upon currently unknown water well characteristics, drive unit selections by the GOT, storage and piping diesels and on-site pump operations.

### 5.9 Project Administration and Management

Project management and administration will be carried out by USAID/RD and two units within the CTDA: Amenagement

Hydro-Agricoles (AHA) and the new proposed Unité d'Autogestion. The AHA will have primary responsibility for installation of new water systems, while the Unité will be responsible for work with Water User Associations before installation (in initial organization, collection of baseline data, and ensuring participation in site selection) and after installation, in operations and maintenance. Both offices will work with the Regional Public Health Directorate in attempting to assure site sanitation and health standards. Both will also work with the Regional and Local Potable Water Committees to assure oversight of the WUAs. Basic project documentation and reports will be prepared by these offices and sent to AID under cover of a letter signed by the Authorized Project Representative, the President Director General. CTDA will provide USAID with yearly reports of the GOT contribution to project funding. A more detailed analysis of CTDA capabilities is found at Annex F.

USAID/RD will continue in essentially the same monitoring role under this project as it has under the previous one, with assistance from the Regional Engineer on a quarterly basis. Little change in basic workload is foreseen during 1986. There will be a major increase in workload, however, beginning in 1987 when the short-term third country training is expected to begin. There are a number of options for third-country training for USAID/RD to work out with CTDA, including short-term technical training in France; study-observation tours to Morocco, Senegal and Egypt for Regional and Local Potable Water Committee members to learn about participation in other settings; and possible formal short-term training for CTDA and/or Public Health staff in Egypt or Morocco in specific skill areas related to rural communications. Twelve person months a year of such short-term training are programmed, which is a high workload considering the necessary planning that needs to be undertaken to ensure successful training. There will be some additional workload in terms of procurement during the first year of the project as well. (See Annex K).

To handle this workload a staff person will be added to the Agricultural and Rural Development Office to manage the training program and assist in general project administration, beginning in mid-1986.

With respect to the provisions of STATE 243643 regarding application of the Gray Amendment which supports enhancing the role of women and minority-owned firms in AID-financed contracts, the project will provide for contracting and subcontracting possibilities for 8(a) firms where feasible and appropriate for

project contracting requirements for short and long-term technical assistance.

Annex K includes a Procurement Plan, a Training Plan, and draft Scopes of Work for Technical Assistance.

## 6. MONITORING & EVALUATION PLAN

### 6.1 Project Monitoring

As discussed at both Annex E, Policy and Practice, and Annex H, Social Analysis, basic data in Central Tunisia against which to monitor or evaluate project progress or impact is in short supply. Progressive repartitioning of governorates into new and/or different delegations frustrates attempts at time-series analysis. Administrative irregularities, such as the fact that the Public Health Directorate collects data based on five arrondissements, some of which cover partial delegations, do not help.

Data collected during 1980-1981 field surveys of proposed water points under to date are scanty and unreliable. Three descriptive socioeconomic surveys (Isely, 1982; Hopkins, 1983; Smith, 1985) provide useful information, but are limited in scope. With the exception of the generally good quality of the 1984 preliminary census data, the proposed project will thus begin with weak socioeconomic, and in some areas technical, data bases.

The proposed Water Resources Mapping Study will alleviate some of the problem and will, at the start of this project, provide an up-to-date descriptive inventory of ground water resources in Kasserine, North Gafsa and Sened. It will additionally provide for cross referencing this information with the 1984 census regarding population density and distribution, and with existing hydrogeological data. The study will provide information on which to base choice of sites for water systems to be installed under the project. Finally, it will provide a basis for the Regional Potable Water Committee to establish updated and possibly more rational criteria for systems to be constructed with scarce GOT resources.

Part of the stated purpose of this project, however, is "demonstrating a model to the GOT which may be appropriate for adoption as a nationwide strategy". "Demonstration" will require information, not only at the beginning but throughout

the project. An ongoing monitoring system which goes beyond reporting on the status of "wells drilled" and "groups formed" is thus essential to achievement of the project purpose.

An outline of the monitoring system proposed follows:

- 1) The Water Resources Mapping Study maps must be maintained and periodically updated. This will require inputs not only from agencies involved in potable water supply --i.e. Genie Rural, PDR, SONEDE, and CTDA/AHA-- but also from the agricultural agencies installing irrigated perimeters and providing credit for private wells. This updating function should ideally be performed by the CTDA geographer who will have participated in the study. Inputs would be gathered by the Unité d'Autogestion and AHA during Potable Water Committee meetings, and from CRDA and AHA on private surface wells and irrigated perimeters.
- 2) The Unité d'Autogestion must collaborate with the members of the Associations in establishing baseline data and in monitoring changes in that data over time, particularly as regards the human and livestock population using the water point. The Local Organizations Consultant provided annually to assist the Unit in planning and monitoring will assist in developing methods for the baseline collection and in establishing monitoring indices. One useful method that has proven successful elsewhere is the enlistment of schools and schoolchildren as "researchers" to monitor changes in domestic water use patterns.
- 3) The Unité d'Autogestion must emphasize the need for financial autonomy and credibility for the Associations from the outset. Financial viability will only be demonstrated through hard numbers. Funds for in-country training and Tunisian technical assistance, possibly from the Kasserine Banque Nationale de Tunisie, are provided for this purpose.
- 4) Actual and projected cash flow for the more costly "second level" maintenance and major repair function --including staff overhead-- maintained by the PDR must be established and maintained. The long-term Maintenance and Inventory Advisors (U.S. and Tunisian) will provide assistance in this regard.
- 5) The Direction of Administration and Finance (DAAF) of CTDA should consider establishing the AID-funded Potable Water Project as a separate cost center for Title I as well as Title II budgets. It is likely that the Unité

d'Autogestion or an organization performing its equivalent function will be required well into the future, and the administrative costs of maintaining it will be an important element of financial projections.

6) Genie Rural is installing meters on at least 3 systems this year. Comparison of actual water consumption with improved human and animal population data for those wells will provide a much stronger basis for water planning than is currently available.

7) USAID/Tunis will itself monitor the actions proposed above in addition to the standard "X wells drilled" and "X groups formed" monitoring function. The monthly reports of the Tunisian A&E firm and required project reports from CTDA will help fulfill that need. Through visits to CTDA, USAID/Tunis staff should verify that new well sites have been put on maps, and that the Unité d'Autogestion is undertaking credible socioeconomic assessments. This sort of activity would add at most 1-2 hours to the standard field monitoring trip.

USAID/Tunis will, in addition to monitoring the above, undertake quarterly contact with SONEDE/Tunis to share information regarding progress under this project and the 7th Loan. A key assumption of the project is that SONEDE will assume responsibility for rural water supply in Central Tunisia by the year 2000; SONEDE is understandably interested in the progress of the Associations in terms of helping it achieve that goal in a cost-effective manner. Information sharing meetings between SONEDE and USAID/Tunis can help move towards that goal.

## 6.2 Evaluation Plan

The proposed budget provides for two joint evaluations, one each in the spring of 1987 and of 1989. The first should come at least a year after the completion of the Resource Mapping Study in 1986 so that it would be possible to obtain time series data. The 1989 evaluation should assess whether an end-of-project evaluation is warranted, and if so, should provide recommendations for it. Both evaluations will be formative and will focus on the outputs and purpose-level measures of achievement (see Annex B, Logical Framework). The only "hard" quantifiable measures of goal achievement --GOT savings -- will be evaluated by USAID/Tunis during annual program review of GOT Budgets.

Both evaluations are budgeted for 6 person months of effort each, that is 4 persons each at 1.5 months. The team composition should include: a Team Leader/Evaluation Specialist with experience in evaluating potable water projects; a Local Organizations specialist, probably an anthropologist; a Financial Management specialist with expertise in accounting and micro-level analysis; and a Hydrogeologist with experience in the technology being used in this project.

The evaluations should be able to assess progress towards all indicators, and to predict the probability of financial viability of the water systems over time. The evaluators may investigate additional indicators, e.g. economic uses of water as demonstrated by small garden plots or increased flocks, if warranted. In combination with an operational monitoring plan as outlined above, the evaluations should greatly facilitate AID policy dialogue with the GOT.

## 7. CONDITIONS PRECEDENT AND COVENANTS

This Project Paper will be obligated through a FY 86 Grant Agreement.

### 7.1 Covenants

The following covenants are proposed:

Project Evaluation. The Parties agree to establish a joint evaluation program as part of the Project. Except as the Parties otherwise agree in writing, the program will include, during the implementation of the Project or at one or more points thereafter:

- a) evaluation of progress toward attainment of the objectives of the Project;
- b) identification and evaluation of problem areas and constraints which may inhibit such attainment;
- c) assessment of how such information may be used to help overcome such problems; and
- d) evaluation, to the degree feasible, of the overall development impact of the Project.

### Potable Water User Associations (Associations)

- a) The Grantee will continue to support the establishment of Associations at all public rural potable water points in Kasserine Governorate and at project-funded sites in Gafsa Governorate over the course of the Project;

- b) Associations shall be responsible for recurrent operations and maintenance costs of their potable water systems and for site sanitation and health conditions of the sites around which they are formed; and
- c) The Grantee will support and respect the financial autonomy of these Associations, within guidelines to be developed by the Regional Potable Water Committee, in the collection and disbursement of funds while carrying out the tasks noted in b. above.

Cost Recovery Plan. The Grantee agrees that by June 30, 1988, it will present to A.I.D. a cost recovery plan with quantitative benchmarks to implement progressively within the life of the Project, cost recovery in the public, non-SONEDE water points in the Project area. This plan will include all such Project and non-project funded motorized water points in the Governorate of Kasserine and all such Project funded sites in the Sened and Gafsa Nord delegations of the Gafsa Governorate.

## 7.2 Conditions Precedent to Disbursement

First Disbursement. Prior to the first disbursement under the Grant, or to the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Grantee will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

- a) A statement of the name of the person holding or acting in the office of the Grantee specified in Section 8.2, and of any additional representatives, together with a specimen signature of each person specified in such statement;
- b) Evidence that the Grantee is committed to creating within the Central Tunisia Development Authority (CTDA) a new organizational unit that (1) reports directly to the President Director General and has the purpose of providing support and training to the Potable Water User Associations (Associations) of Central Tunisia; and (2) will have an adequate budget to support at least one Grade A and three Grade B officers and to provide the officers with the means to carry out their functions.

### Additional Disbursements:

- a) Prior to disbursements under the Project, or to the issuance of commitment documents pursuant to which any disbursement will be made, for any Project activity except for the Water Resources Study, the USAID personal services contract and the construction of the first four new water systems, the Grantee shall furnish to A.I.D. in form and substance satisfactory to A.I.D.:

- 1) Evidence that the Associations in the Kasserine and Gafsa Governorates will be accorded such status, in a timely manner, that enables them to collect and disburse funds and to enter into contracts for the operation and maintenance of the water systems for which they are responsible; and
- 2) Evidence that the new unit has been created in the CTDA and has a sufficient operating budget to adequately staff it and allow it to carry out its functions.

b) Prior to any disbursements under the Project, or to the issuance of any commitment documents pursuant to which such disbursements will be made, for any one of the remaining water systems under the Project, (excluding the initial 4), the Grantee shall furnish to A.I.D., in form and substance satisfactory to A.I.D.:

- 1) New criteria for the selection of the sites;
- 2) Evidence that the proposed site (i) has been selected according to the new criteria; (ii) has been approved by the Regional Potable Water Committee; (iii) has an established and operational Association in connection with it; and (iv) is being constructed according to plans and specifications approved by A.I.D.; and
- 3) A signed contract with an A and E firm.

Notification. When A.I.D. has determined that the specified conditions precedent have been met, it will promptly notify the Grantee.

Terminal Dates for Conditions Precedent.

- 1) First Disbursement: If all of the conditions specified in Section 4.1 (of the Pro/Ag) have not been met within 90 days from the date of this Agreement, or such later date as A.I.D. may agree to in writing, A.I.D., at its option, may terminate this Agreement by written notice to Grantee.
- 2) Additional Disbursements: If the condition specified in Section 4.2(a) (of the Pro/Ag) has not been met by December 30, 1986, or such later date as A.I.D. may agree to in writing, A.I.D., at its option, may cancel the then undisbursed balance of the Grant, to the extent not irrevocably committed to third parties, and may terminate this Agreement by written notice to the Grantee.

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ANNEX A  
TELEGRAM

PAGE 01 OF 02 STATE 193291  
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STRO-01 EAST-01 ENGR-01 RELO-01 MAST-01 Y/23 AS 225

INFO L00-00 EB-00 NEA-07 L-03 /010 B

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GC/NE: S. HARRIN (DRAFT)

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TAGS:

SUBJECT: NEAC REVIEW - RURAL POTABLE WATER - PROJECT  
664-0312.7 PID FOR PP AMENDMENT

REFERENCE: TUNIS 4895

1. GENERAL: THE NEAC REVIEWED SUBJECT PID JUNE 11, 1985 WITH THE PARTICIPATION OF THE MISSION DIRECTOR. THE NEAC APPROVED OF THE PID SUBJECT TO CONSIDERATIONS STATED BELOW. OAA/NE HEREBY REDELEGATES TO MISSION THE AUTHORITY TO EXTEND THE PACD FROM JUNE 30, 1985, TO JUNE 30, 1986. MISSION HAS THE AUTHORITY TO ADD DOLS. TWO MILLION TO THE PROJECT UNDER REDELEGATION OF AUTHORITY NO. 113.31 (AS RECENTLY REVISED) SINCE UMBRELLA LOP FUNDING IS LESS THAN DOLS. 30 MILLION. OAA/NE UNDERSTANDS AND APPROVES MISSION'S INTENTION TO EXERCISE THIS AUTHORITY IN MANNER SUGGESTED BY REPTEL. IN VIEW OF THE INNOVATIVE NATURE OF THE SUB-PROJECT, PARTICULARLY THE USER FEES, BENEFICIARY PARTICIPATION THROUGH ASSOCIATIONS, THE MISSION DIRECTOR HAS AGREED TO ADVISE AID/W OF THE PP DESIGN TEAM'S FINDINGS AND RECOMMENDATIONS AT THE END OF ITS INVESTIGATION.

2. THE NEAC SUPPORTS THE MISSION'S ATTEMPT TO TAKE AN

INNOVATIVE STEP WITH THE GOT IN DEVELOPING THIS SUB-PROJECT AMENDMENT. THE NEAC REVIEWED THE THREE KEY ELEMENTS (COST RECOVERY THROUGH USER FEES, OPERATIONAL CAPACITY OF THE USER ASSOCIATIONS, AND GOT SUPPORT (AT THE CENTRAL AND REGIONAL LEVELS)). THE MISSION DIRECTOR AGREED THAT USER FEES WERE A CRITICAL ELEMENT AND WOULD NOT PROCEED WITHOUT RESOLUTION OF THIS ISSUE. THE OTHER TWO ELEMENTS, WHILE IMPORTANT, WERE SUBJECT TO NEGOTIATION WITH THE GOT.

3. IN CONJUNCTION WITH THE USER ASSOCIATIONS, THE NEAC NOTED ONE MODEL MAY NOT BE APPROPRIATE IN ALL CASES AND SUGGESTED THAT THE PP DESIGN TEAM BE FLEXIBLE IN THIS RESPECT SO THAT VARIOUS MODELS, INCLUDING UTILIZING THE PRIVATE SECTOR FOR OPERATION AND MAINTENANCE OF PARTICULAR WATER SYSTEMS, CAN BE EXPLORED IN INDIVIDUAL CASES.

4. GOT SUPPORT: THE NEAC AGREED THAT CENTRAL AND REGIONAL GOT SUPPORT IS CRUCIAL TO THE SUCCESS OF THE SUB-PROJECT. THE GOT SHOULD PROVIDE APPROPRIATE

DOCUMENTATION DESCRIBING THE INSTITUTIONAL ARRANGEMENTS AND SUPPORT SYSTEM REQUIRED TO SUPPORT THE PROJECT AND SUSTAIN ACTIVITY AFTER AID ASSISTANCE HAS TERMINATED. THIS MIGHT INCLUDE A NEW INTERDEPARTMENTAL OR REGIONAL SERVICE, IF CREATED, OR EXISTING GOT GOVERNMENTAL UNITS SUCH AS SOME OF THE MOBILE MAINTENANCE TEAMS. IT WAS AGREED THAT THE ADEQUACY OF GOT SUPPORT IS DIFFICULT TO DETERMINE AT THIS TIME, AND THAT THE ADEQUACY WILL BE LEFT TO THE MISSION'S JUDGMENT AS NEGOTIATIONS CONTINUE WITH THE GOT AND THE PP DESIGN TEAM'S INVESTIGATION ENDS.

5. LOCAL LEADERSHIP: THE NEAC AGREED THAT COMPETENT LOCAL LEADERSHIP IS AN IMPORTANT ELEMENT TO THE PROJECT'S SUCCESS. ADDITIONALLY, USER ASSOCIATIONS MUST HAVE COMPETENT LEADERS. THE PP SHOULD CONTAIN A STRATEGY FOR DEVELOPING LEADERSHIP CAPABILITY AT ALL LEVELS, INCLUDING PLANS FOR TRAINING AND EDUCATION, BUT PARTICULARLY AT THE LOCAL LEVELS.

6. PP DESIGN - THE NEAC THOUGHT THAT, IN LIGHT OF THE CRITICAL ROLE SOCIOCULTURAL FACTORS WILL PLAY IN DESIGNING SITE-SPECIFIC TECHNICAL AS WELL AS ORGANIZATIONAL SOLUTIONS, THE INSTITUTE FOR DEVELOPMENT ANTHROPOLOGY (IDA), WITH ITS APPLIED SOCIAL SCIENCE SKILLS AND TUNISIA EXPERIENCE, WAS AN APPROPRIATE LEAD ORGANIZATION FOR PP DESIGN. HOWEVER, IT WAS FELT APPROPRIATE TO HIGHLIGHT THE NECESSITY FOR THE PROJECT DESIGN TEAM TO DRAW UPON THE GROWING WORLDWIDE EXPERIENCE

IN SUCCESSFUL AND UNSUCCESSFUL TECHNOLOGICAL ASPECTS OF SMALL WATER SYSTEMS DESIGN, OPERATIONS AND MAINTENANCE, RECOVERY OF ORIGINAL AND RECURRING COSTS, AND THE CREATION OF WATER USER ASSOCIATIONS. IN THIS REGARD, THE NEAC AND MISSION DIRECTOR CONCURRED IN THE PROPOSAL THAT THE WASH PROJECT, WITH ITS LARGE ARRAY OF PERTINENT TECHNICAL SKILLS, COULD SUPPLEMENT IDA'S SOCIOLOGICAL SKILLS AND THEREBY STRENGTHEN THE DESIGN TEAM. AS AN INITIAL EFFORT, IT WAS DECIDED THAT AID/W SHOULD ARRANGE AN IN-DEPTH EXCHANGE OF IDEAS AND INFORMATION BETWEEN IDA AND WASH DURING A WASHINGTON, D.C., TDY OF IDA TEAM MEMBERS.

7. CONDITIONS PRECEDENT: THE NEAC AGREED THAT IT IS PREMATURE AT THIS TIME TO SOLIDIFY APPROPRIATE CP'S GIVEN THE NEW AREAS BEING EXPLORED BY THIS SUB-PROJECT AMENDMENT.

8. AMENDMENT OR NEW PROJECT: THE NEAC DISCUSSED WHETHER IT IS MORE APPROPRIATE TO AMEND THE EXISTING SUB-PROJECT OR CREATE A NEW PROJECT. ALTHOUGH THERE ARE MERITS TO EITHER APPROACH, THE NEAC ACCEPTED THE MISSION'S PROPOSAL TO AMEND THE EXISTING PROJECT AS THE MOST EFFICIENT WAY TO ACHIEVE PROJECT GOAL AND PURPOSE.

9. OTHER DISCUSSION POINTS/CONCERNS:

(A) GIVEN THE PROJECT'S COMPLEXITY, THE PP SHOULD INCLUDE LEAST COST CONSTRUCTION PLANS, COST BENEFIT ANALYSES, INTERNAL RATE OF RETURN PROJECTIONS, AND FINANCIAL ANALYSES (INCLUDING BOTH IN-KIND AND MONETARY CONTRIBUTIONS) WHICH WILL ADEQUATELY SUPPORT THE PROJECT. SUCH PLANS AND COST ESTIMATES SHOULD BE SUFFICIENT TO SATISFY FAA SECTION 611 (A).

(B) THE PROJECT SHOULD UNDERTAKE IN ITS SOCIAL SOUNDNESS ANALYSIS A STUDY OF THE PROJECTED BENEFITS THAT WILL ACCRUE TO USERS THROUGH THE PROPOSED SYSTEM OF ASSOCIATIONS AND ASSESS THE IMPACT OF THE NEWLY CREATED REGIONAL OR INTERDEPARTMENTAL SERVICE THAT WILL SUPPORT

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10

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ANNEX A-1  
TELEGRAM

PAGE 02 OF 02 STATE 193291  
PROJECT ACTIVITIES.

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(C) THE CABLE PID DID NOT MENTION HOW THE EVALUATION PLAN AND BUDGET FOR THE PP WILL BE HANDLED. THIS SHOULD BE A TASK FOR THE PP DESIGN TEAM.

(D) THE AMENDED PP DESIGN SHOULD ADDRESS THE ENVIRONMENTAL CONCERNS IDENTIFIED IN THE ORIGINAL PP AS OUTLINED BY ABE/NE/PD/ENV, STEPHEN LINTNER IN MEMO DATED

APRIL 18, 1988 TO PATRICK DEMOGOT. THE MISSION AND THE PP DESIGN TEAM SHOULD REVIEW ITS CONTENTS AND ADDRESS THE CONCERNS RAISED IN THE PP. FINAL ENVIRONMENTAL CLEARANCE OF THE PP AMENDMENT IS DELEGATED TO THE MISSION ENVIRONMENTAL OFFICER. COPIES OF THE FINAL ENVIRONMENTAL CLEARANCE MEMO SHOULD BE SENT TO AID/W, ABE/NE/PD/ENV, STEPHEN LINTNER.

18. MISSION IS COMPLETED ON ITS UNDERSTANDING AND TREATMENT OF COST RECOVERY AND O AND M ISSUES. SKULTZ

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71

ANNEX B

PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Project Title: Rural Potable Water Institutions  
 Life of Project: FY 86 - FY 91  
 Total U.S. Funding: \$ 6.5 million

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<u>Program or Sector Goal:</u>	<u>Measures of Goal Achievement:</u>		
To improve the quality of life of the rural poor in the CTRD program area.	<ul style="list-style-type: none"> <li>o Improved health of target populations (unquantifiable)</li> <li>o Increased productivity of family members (unquantifiable)</li> </ul>	<ul style="list-style-type: none"> <li>o Regional Directorate of Health statistics on incidence of diarrhea, ameobiasis, scabies, etc.</li> <li>o CTDA monitoring and periodic studies</li> </ul>	<ul style="list-style-type: none"> <li>o Improved <u>access</u> to water will lead to increased <u>use</u> of water; this increased use leads to improved health</li> <li>o Time savings resulting from decreased distance to fetch water will be reallocated to more productive activity</li> </ul>
<u>Project Purpose:</u>	<u>End of Project status:</u>		
1. Establish and refine a coordinated and decentralized institutional approach to rural water operations and maintenance, with user participation and user fees, demonstrating a model to the GOT which may be appropriate for adoption as a nationwide strategy.	<ul style="list-style-type: none"> <li>o By 1990, Water User Associations (WUAs) will have been established at <u>all</u> water points in the <u>program</u> area and 85% of them will be covering 100 percent of O+M costs.</li> <li>o Regional &amp; Local Potable Water Committees will be meeting regularly; site specific WUAs will have representatives on at least 4 local-level committees.</li> </ul>	<ul style="list-style-type: none"> <li>o CTDA monitoring reports</li> <li>o WUA Accounts</li> <li>o Minutes of Committee Meetings (thru CTDA)</li> <li>o Membership lists of Committees (thru CTDA)</li> </ul>	<ul style="list-style-type: none"> <li>o High level political support for WUAs will continue.</li> <li>o Citizens will continue to accept need to pay for water themselves and will be able to pay at least O+M costs.</li> <li>o Regional &amp; local technical services will continue to cooperate in improving rural water supply.</li> </ul>

11

- o Regional and local private sector suppliers and service enterprises will have established linkages with WUAs for fuel, spare parts, and basic repair.
  - o SONEDE will have assumed service responsibility for at least one site administered by a WUA.
  - o At least one other rural area of Tunisia will be adapting the CIRDA area WUA model.
  - o Kasserine Regional Water Committee will have adopted a stronger policy for guiding site selection of Project and non-Project sites for installation of water points which includes cost effectiveness analysis of alternative approaches and regional/spatial considerations.
  - o Hydrogeologic data base in Kasserine, North Gafsa, and Sened will serve as basis for rational exploitation of water resources.
  - o At least 30 new installations (26 productive boreholes and 4 extensions) and up to 2 NMM systems
  - o New installations will be providing potable drinking water to serve an average of approximately 50,000 persons
  - o Sample survey (informal) during project evaluations
  - o SONEDE records
  - o Ministry of Agriculture (Genie Rural) reports.
  - o Review of non-AID-funded sites selected annually by committee during Project Evaluations.
  - o DRES documents
  - o Project monitoring and evaluation
  - o Supply of private sector maintenance services will respond to demand in rural areas.
  - o SONEDE activities under IBRD 7th Loan will continue more or less as planned.
  - o The GOT will choose to adopt the WUA for another rural area.
  - o Site selection will continue to be undertaken through Regional and local Committees with WUA participation based on shared criteria and commitment.
  - o CTDA will improve cost center financial data analysis.
  - o DRES in Gafsa Governorate will cooperate fully with CTDA and DRES/Kasserine
  - o Exploitable water resources exist in currently unreached areas.
  - o At least 26 out of 30 planned boreholes will yield a minimum of 1-5 LPS.
2. Maximize water investments by improving site selection for new and improved water systems.
3. Provide improved access to potable water for underserved rural populations.

- o Hydrogeologic resources in Kasserine, North Gafsa and Sened are such that cost-effective, productive wells can be drilled.

- o Regional administration maintains support for experimental efforts

- o GOT will authorize positions promptly so that staffing UAG can be completed.

**Outputs:**

**Magnitude of Outputs:**

1. Water User Associations established and functioning in Kasserine Governorate and in Gafsa delegations of North Gafsa and Sened with
- o Legal status
  - o Financial autonomy
  - o Management autonomy
  - o Defined membership
  - o Trained leadership/management

- 1.a. All WUAs in both Governorates will have legal status to collect and disburse funds
- b. 90% of WUAs will have postal or bank accounts
  - c. 90% of WUAs will have used local private sector for maintenance or repair.
  - d. 50% of WUAs will have invested some funds in site improvement
  - e. 100% of guardian-pumpists and WUA treasurers will have received formal and on-the-job training.

- a. Governorate or Ministerial action (decree, law, statute)
- b. PTT or BNT records; WUA records
- c. Evaluation survey
- d. Evaluation survey
- e. CTDA records and interviews during evaluations

2. Water User Associations supported by decentralized regional support systems coordinated by new "Unité d'Autogestion" (UAG); support includes:
- o inter-service committees for policy and regulatory actions
  - o Unité for extension and training support
  - o Maintenance Brigade for technical, 2nd degree support
  - o "Education Sanitaire" for health, hygiene and education

- 2.a. Regional or Local committee representatives will visit each site once each quarter.
- b. "Unité d'Autogestion" staffed by 4/86;
  - c. Each WUA receives 1 visit/month by UAG staff by 6/88.
  - d. Regional Maintenance Brigade providing 2nd degree preventative maintenance repair on a timely basis
  - e. MOPH Regional Sanitarians and other staff conducting training sessions in each WUA perimeter on a quarterly basis.

- a. Evaluation Interviews; committee meeting minutes.
- b. CTDA reports
- c. Evaluation; records and interviews
- d. Evaluations; records and interviews
- e. Evaluation; records and interviews

MAR 17 1986

- 3. New water distribution sites established and functioning.
  - 3. a. 30 boreholes, (of which a minimum of 26 are productive), 4 extensions and 2 house hook-up systems completed by 12/31/90
  - b. RSH and DRES trained in use of equipment, testing equipment.
  - c. Tunisian A&E firm providing timely design, advice and construction monitoring.
- 3.a. DRES and CTDA reports
- b. Project records
- c. Project records
- d. Project records
- o The TH-60 drilling rig purchased during previous proj. will continue to be used in CTDA area
- o Research equipment provided by AID will be procured and delivered in a timely manner
  
- 4. Hydrogeologic data base in Central Tunisia improved
  - 4. a. Water Resources Mapping completed by 6/86 to enable site selection to take place
  - b. Hydrogeologic data improved through test drilling in southern Kasserine, North Gafsa and Sened in 1986, 87, 88 with new research.
- 4.a. DRES and CTDA reports
- b. Project records
- c. Project records
- d. Project records
- o Contracting by AID is undertaken in timely manner with qualified and interested individuals and/or firms.

Inputs:

Implementation Targets:  
(\$'000)

	<u>AID</u>	<u>TUNISIA</u>
1. Personnel and TA	1,162	795
2. Construction	3,967	-
3. Commodities	369	611
4. Training	189	187
5. Other	-	1,120
Evaluation/Audit	232	-
Inflation	581	677
<b>Total</b>	<u>6,500</u>	<u>3,390</u>

5/

MAR 17 1986

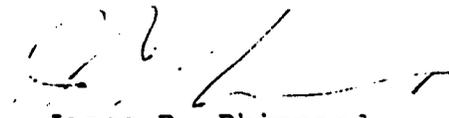
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ANNEX C

Principal Officer's Certification  
Pursuant to Section 611(e) of the FAA 1961, as amended

I, James R. Phippard, Director and the principal officer of the U.S. Agency for International Development in Tunisia, having taken into account, among other things, the utilization and maintenance of projects in Tunisia previously financed or assisted by the United States, do hereby certify that in my judgement the Government of Tunisia has both the financial capability and the human resources to effectively construct, utilize and maintain the rural potable water points, to be installed under the Rural Potable Water Institutions Project in the Governorates of Kasserine and Gafsa.

This judgement is based upon general considerations discussed in the Project Paper, to which this Principal Officer's Certification is to be attached.

  
James R. Phippard  
Director

Date: 3 24 86

ANNEX D

FAA 611 (a) CERTIFICATION

TO: Mr. William M. Egan, RD Officer

FROM: Tibor Nagy, R/ENG

SUBJECT: Rural Potable Water Institutions Project  
No. 664-0337), FAA Section 611 (a) certification

1. From November 1982 through this date, on several occasions, I have visited in the Central Tunisia project area existing and proposed rural potable water point sites: spring cappings, shallow wells and drilled wells.

I have also reviewed - together with ODTG (CTDA) officials - the engineering plans and specifications, developed by Tunisian A&E firms for the installation of the various water points.

I am familiar with the well drilling operations, as described in the Project Paper.

2. Although not all sites for the proposed water points are yet identified, and most will be identified only during the course of project implementation, the sites and installations are sufficiently similar as to be adaptable to the general selection criteria, indicated in the Project Paper.
3. Cost estimates for boreholes, extensions, civil works and equipment appear to be in line with similar construction costs within Central Tunisia. Furthermore, during the implementation of the Project the FAR amounts for the various water points will be adjusted as experience and actual cost records become available.
4. On the basis of the above, therefore, I have determined that the engineering plans and specifications for the rural potable water points are sufficiently detailed to satisfy the intent of Section 611 (a) of the Foreign Assistance Act of 1961, as amended.

ANNEX E

GOT COMMITMENT: POLICY AND PRACTICE

The purpose of this annex is to analyse current GOT policy for provision of potable water to rural areas and for (partial) recovery of program costs from consumers. The formal written laws and regulations are summarized in Section 1 below. GOT commitment to carrying out these policies is discussed in Section 2. A final Section 3 identifies changes required to undertake the proposed project, and assesses the probability of acceptance of these changes at the national, governorate and water association level.

1. GOT LEGISLATION AND ADMINISTRATIVE ORDERS

1.1 The Water Code

GOT policy towards all fresh water is founded in the 1975 Code Des Eaux (Water Code), which is a formal national law passed by the National Assembly on March 18, 1975 and subsequently (3/31/75) signed by the President. It replaces two former operative laws dating from colonial times (Decrees of 1920 and 1936). It provides for the exploitation, conservation, protection and management of all water in the public domain, and places water resources under the administrative authority of the Ministry of Agriculture unless specifically excepted by decree. Water in the public domain is defined in Article 1 of Code as:

- Watercourses of all types and the land immediately adjacent within their overflow banks;
- Reservoirs, pools, etc. established by watercourses;
- All nature of springs;
- All subterranean aquifers;
- Lakes and Sebkhas (saline catchments or ponds);
- Aqueducts, wells and livestock troughs and their appurtenances created for public use;

- Canals for navigation, irrigation or drainage installed by the State or on its behalf for the purpose of public use as well as the land on their overflow banks and land on which their appurtenances are located.

Water for human consumption is specifically defined as follows:

Water destined for consumption comprises pure or treated water destined for drinking, domestic use, and for the manufacture of carbonated water, mineral water, ice and all other products for human consumption.

Water destined for consumption must not contain chemical or biological substances detrimental to health. It must be free from all signs of pollution and have bacteriological levels which render it acceptable for consumption. (Water Code, substantive translation of Article 97).

"Potable water" is further defined in Article 98 as that water which follows the conditions set forth in Article 97 (above) and which "satisfies the conditions and norms established by decree". The Ministry of Public Health is charged with establishing water quality standards by decree, and with establishing systems for periodic monitoring of quality.

Water for agricultural use is not as precisely defined, but is subject to a series of specific conditions. Of particular concern is the conservation and optimization of irrigation water, the concern for proper drainage, and the avoidance of health hazards created by irrigation.

Tunisia's water resources are well protected by the Code. For example, Article 9 provides that surface or bored wells of less than 50 meters depth can be installed by a private citizen through simply informing the administration. This free access is excepted, however, by Articles 12 and 15, which allow the administration to establish "prohibited perimeters" and "guarded perimeters" in areas where the aquifer or water table is threatened by potential overexploitation. In Kasserine, the Direction des Ressources en Eau et en Sol (DRES) has, in fact, excepted several areas and private surface wells are now being permitted only on exceptional bases.

The Code includes several lengthy sections on prevention and monitoring of water pollution, and on prevention of damage from flooding.

Finally, the Code provides for the management and administration of water resources. As previously stated, all water in the public domain is under the authority of the

Minister of Agriculture, who can himself delegate that authority by ministerial decree. The Minister relies on two national entities, a Commission du Domaine Public Hydraulique and a Comité National de l'Eau, for advice in certain matters of national interest. At the regional level, the Code specifically provides for the creation of citizen-government collaboration in water use. Chapter 8, "User Associations", states the following:

Article 153: A consultative body is constituted in each governorate, presided over by the Governor, and composed of representatives of the Administration and of users, to be called Groupement d'Intérêt Hydraulique, which will:

- 1) present suggestions of general interest concerning use of water in the public domain in the governorate;
- 2) offer advice and opinions about water-related projects being considered by the governorate;
- 3) supervise ("controller") associations of owners and users concerned with the utilization of water in the Governorate.

The composition and functioning of the Associations of Groupement d'Interet Hydraulique is defined by decree. (see Section 1.2)

Article 154: For the execution, maintenance or utilisation of water in the public domain for which they have rights, users can be grouped in Associations Locales of owners or of users within the Groupement Hydraulique.

Article 155: The Owner Associations for irrigation or sewerage and all other methods of drainage have the same rights and obligations as the Associations d'Intérêt Collectif.

In terms of the proposed rural potable water project, this legislation allows for all contemplated actions and specifically supports resolution of a number of issues expressed by AID concerning participation of beneficiaries (Water User Associations are established), maintenance of health and sanitation standards (provision for the Ministry of Public Health to supervise), and protection of the environment (provision for conservation of aquifers similar to the establishment of water conservation districts in the United States). Within this framework, a number of subsequent actions are similarly supportive.

## 1.2 Administrative Decrees

### 1.2.1 Potable Water

Although the legislative Code Des Eaux is current and relevant, many of the supporting administrative Decrees are less so. Attention has clearly been focused on provision of potable water to urban populations (Law No. 68-22, 1968, creating SONEDE, and subsequent decrees) and on provision and protection of water for agricultural purposes. Future administrative regulation of the associations proposed under this project clearly rests somewhere in the middle.

The SONEDE legislation has been amended several times to allow for continued strong growth of that parastatal. SONEDE currently provides potable water to almost 100 percent of Tunisia's urban population, either through house hook-ups or public taps. Although the major capital investment for installation of systems is covered by the state, private citizens must pay for their house hook-ups over a five year period and for actual water consumed. Public taps are under the jurisdiction of a municipality or governorate and SONEDE has consistently had trouble collecting from these entities. The GOT, through SONEDE, owns both public and house hook-up systems. The people who have hook-ups, in essence, buy the water and so cover operating and minor installation costs. Public taps are theoretically covered by municipal and Governorate "sin taxes".

Two points about SONEDE policy are relevant to the proposed project:

- Water conservation is strongly encouraged through a system of differential payment. A private consumer is billed the actual cost (less capital investment) of water for the first 20 cubic meters; consumption after that is progressively more expensive. Certain sectors of the economy, notably tourism, pay as much as .430TD/cubic meter for water that costs .080 TD, thus contributing to some of the capital investment.
- SONEDE plans to cover 95 percent of the population of Tunisia, including all rural areas, by 2000. This goal is stated as part of the IBRD 7th Loan to SONEDE, and appears achievable given its reputation for competent management and previous achievement. The proposed AID project is thus designed with a view towards eventual takeover of technical backstopping by SONEDE.

### 1.2.2 Agricultural Water

Decrees concerning use of water for agriculture are compiled in a recent (January, 1984) text put out by the Ministry of Agriculture entitled Encouragement de l'Etat au Developpement Agricole. This text, and the evolution of decrees therein, demonstrates pursuit of a carefully balanced policy of government providing capital investment and selected subsidies while at the same time progressively increasing the financial contribution of collective and/or private farmers in installation and maintenance of water points and irrigation systems. In Kasserine, for example, at least 2600 private wells have been installed, many under partially subsidized credit in the last few years.

A second compilation of regulations concerning rural water use for agriculture is circulating internally within the Ministry, this one concerned with modification of the Association d'Intérêt Collectif, or AIC. Discussions with concerned Ministry officials in the Direction de Genie Rural suggest that the final new decree is now quite similar to the old series, which is based on an initial Decree of July 30, 1936. In summary form, the decree provides for citizen participation in water management, operation and maintenance in irrigated perimeters through AICs, supervised by a higher level governmental entity (Groupement d'Intérêt Hydraulique, or GIH). As the new decree is in internal circulation and was not formally available for the design effort, detailed provisions cannot be analysed. USAID was assured, as of the design stage, however, that the new decree will allow for organization of interested water users around a water point, and for their legal autonomy in the collection and disbursement of funds. It appears that final approval of the new Water User Associations will be at the Ministerial level in contrast to the AICs, which require Presidential approval. Of concern to this project is the degree of autonomy of citizen management, and the probability of potable water associations being encouraged under the same (as opposed to new) administrative actions. Section 3 of this Annex recommends steps for CDTA and AID to take in this regard.

### 1.3 CTRD Water Policy

Figure 2 in the main PP text summarizes site selection for potable water points in Kasserine as a result of previous project activities. That is, citizens make (continuous) demands upward through the political-administrative system to the Governor throughout the year. In June and July, a Governorate-level "Potable Water Committee" (similar in structure to the Code des Eaux "Groupement d'Intérêt Hydraulique") meets to choose sites

for the new fiscal year based on these demands and on preliminary technical review by one of a number of technical services. Mutually accepted criteria for site selection are:

- The site must be a truly "thirsty area". Either people must go further than 4 kilometers to fetch water, or the water resources available are inadequate to meet the needs of the population year round. It appears that the needs of livestock are a part of this deliberation. They were included in the original AID-funded CTRD Rural Potable Water Project effort.
- Cost-per-beneficiary is another criterion, although selectively applied. The CTDA potable water points funded by AID formally allow for a combined cost of TD 50 per person, TD 10 per head of large livestock, and TD 1 per head of small livestock. Genie Rural uses a figure of TD 140 per person. SONEDE applies a sliding scale based on number of inhabitants to be served, and it is unclear whether the PDR follows any guidelines or not regarding cost. No implementing or funding agency appears to have set separate cost guidelines on "extensions" to date. (See Annex G, Technical Analysis, on extensions).
- The site selected must provide for unlimited access to the public and their livestock.

All implementing and funding agencies engaged in provision of rural potable water supply also follow GOT Ministry of Public Health guidelines with regard to water quality. Most agencies concede and partially encourage the use of wells for "minor irrigation", generally meaning vegetable gardens or orchard irrigation by canals capturing runoff from the site or through the use of hauled water. To the present, CTDA has had to follow site selection criteria established under the 664-0312.7, Rural Potable Water Subproject of the CTRD Rural Potable Water Project.

During the design over 30 actual and proposed sites (both AID and/or GOT funded) were reviewed; this review leads to the following conclusions about site selection in Kasserine Governorate.

- 1) The Kasserine Governorate "Potable Water Committee" is methodically and strategically selecting sites based on a combination of socio-political, technical, and financial criteria. It appears well understood that each of the involved agencies has slightly different criteria and ability; annual site selection takes this into account.
- 2) The most problematic of the criteria is cost-per-beneficiary. The CTDA criteria are clearly

outdated. None of the agencies have a stated or even implicit policy for financing of "extensions". Data are so poor that attempts to justify cost-per-beneficiary (human or animal) are currently of minimal value.

Resolution of these issues under the proposed project will require valid data on demographics and hydrological characteristics of each site. Section 6 of the PP, Monitoring and Evaluation, recommends actions towards that end.

## 2. GOT COMMITMENT

In addition to the current and planned legislation and administrative actions summarized above, the GOT has in recent years exhibited increasing commitment to provision of rural potable water. During this Sixth Five Year Plan Period (1982-1986), priority is given to developing the less favored regions of Tunisia and in particular to rural areas in the North-West, Central-West and the South in order to reduce regional disparities. The GOT objective is to improve the access of rural populations to rural water by the year 2000. The GOT commitment to this objective is supported by budget allocations representing 7 percent of all GOT capital investments under the Sixth Plan. During preparation of this current Plan, regional representatives mounted a strong lobby for increased allocations for potable water. As a result of these regional consultations, the Ministry of Agriculture/Genie Rural budget for water development was increased from 20 million TD to 60 million TD. That amount, added to the resources available at the Governorate level through the PDR provided a total of 110 million TD nation-wide for the Plan period, an increase of more than seven times the potable water finances made available under the Fifth Plan period.

At the same time, SONEDE negotiated a \$ 50 million loan with IBRD for provision of services specifically to rural areas. The basic IBRD planning document includes 39 villages in Kasserine Governorate\* with populations of between 100 and 1500, with an estimate of approximately 40 percent of households herein to be served by house connections. Approximately 3 percent of the total project costs of \$105 million would go to Kasserine.

\*/ As described previously, under this project, potable water activities will begin in 2 delegations of Gafsa -- Sened and North Gafsa. Strategies as described in this PP will be implemented there after a period of institutional development activities (to establish Regional and Local Potable Water Committees, etc) of an abbreviated length.

The GOT has also negotiated a number of agreements with other donors with the objective of increasing the percentage of the rural population served by public water supply. Section 2.4.2 provides information on the contributions of other donors in support of this policy.

Commitment to provision of potable water supply in rural Kasserine appears high. Although probably incomplete, data available at the time of design indicates a 500 percent increase in closed, motorized, uncontaminated systems between 1980 and 1985, that is from 8 to 40. Only approximately 20 of these completed systems were constructed with donor (e.g. AID) financing; the rest were funded by the GOT. It may be safely assumed that the GOT will continue to invest in water in the project area, both through the SONEDE efforts (assume 6 systems/year) and through Genie Rural and the PDR (assume another 3 large systems per year).

This commitment to installing new systems, however, has not been matched by financial or personnel resources for maintenance of the systems. Indeed, although almost 50 percent of the Kasserine PDR annual budget is allocated towards the installation of potable water systems, it must use some of that money each year to supplement the Governorate Council's inadequate maintenance allowance (see Annex F, Institutional Analysis, for a complete description of maintenance). Data provided by the PDR for the design reflect an almost 50 percent shortfall each year since 1980.

The Governor and his council and the PDR are all essentially politically-oriented and would be best served by installing more and better water points each year. The fact that the PDR, with financing from the Council and its own funds, must be responsible for maintaining points is a problem. The fact that funds allocated for new systems must be used to repair old ones does not contribute to overall political aims.

The Governor has thus become a strong and vocal participant in the AID-initiated policy dialogue regarding getting the citizens to pay for water. His council and the PDR are equally supportive. Nonetheless, word has gone out to the Delegates in Kasserine to promote citizen participation in paying for systems, and this top-down approach seems to be working. As stated elsewhere, in the last 2 - 3 months, 5 points have begun a regular water payment system and another 35 have initiated some payment schedule. As discussed in Annex H, some of these efforts are currently being carried out through the Party offices due to lack of a legal status for the associations.

As stated in Section 1.2 above, the Ministry of Agriculture is engaged in elaborating a legal framework for potable water

associations while the Kasserine experiment continues. Given these recent actions, and accepting the long-standing policies enacted by SONEDE, it appears that GOT commitment to self-supporting operations and maintenance may be assumed. Section 3 that follows outlines steps that need to be taken to assure this commitment is sustained.

### 3. ACTIONS NECESSARY TO SUPPORT PROPOSED ACTIVITIES

Policy analysis cannot be based on personal motivation or commitment, and in spite of the persuasive actions of the current Governor of Kasserine, this caution is important. In order to assure that the recent efforts he has so strongly supported are continued, some formalization of the situation is required.

Caution is also advised, however, in pursuing more formal status for these actions underway. Bureaucrats from any culture have a tendency towards categorization, towards uniformity, and towards quantification. The existing nascent Potable Water Associations in Kasserine should be protected to the extent possible from excessive regulations or standardization.

As discussed at Annex H, the Associations need no more than 3 key figures, who are proposed to be selected by the people. The Associations are proposed to evolve as a sort of private voluntary organization, rather than a governmental entity. It is likely that the existing AIC decree that is reportedly being revised by Genie Rural to encompass the Potable Water Associations would probably tend more towards the governmental form. Both AID and CTDA must remain in close contact with Genie Rural as the revised version is developed.

In the meantime, given the need for legal status, the Governor of Kasserine has proposed that he will formally authorize the Associations to legally collect and disburse funds for the purposes of maintaining rural potable water supply. The Governor believes he is legally allowed to do this as long as the Associations are considered "experimental". This status should be adequate to protect the rights of the Associations, at least in the initial years of the project. He is assuming --as does this PP-- that Associations must be formed at all public rural potable water points in Kasserine.

The following recommendations grow out of the design:

1. The Grant Agreement should include a Condition Precedent to Additional Disbursements that states: "Prior to the approval of any disbursements

requested after September 30, 1986, the GOT shall provide AID with written evidence that the experimental Associations for Potable Water contemplated under this project have been accorded status enabling them to collect and disburse funds and to enter into contracts for the purposes of operating and maintaining the water systems for which they are responsible". This phasing should allow the Governor of Kasserine and CTDA time to propose guidelines based on experience rather than bureaucratic need. Given that the previous project did not work in Gafsa Governorate it is appropriate that status for Associations there be obtained later than in Kasserine; a covenant concerning this has been included. The CTDA should use the same iterative approach there as it has in Kasserine in developing water associations .

2. AID and CTDA should remain in close contact with Genie Rural, and AID should be prepared to offer consultant assistance to Genie Rural should it appear to need it in terms of revision of the AIC decree. Dialogue with Genie Rural should emphasize the simplicity and non-governmental nature of the Associations, within guidelines and in accordance with standards set by the GOT.

3. AID should continue its policy dialogue with the GOT for recovery of full operation and maintenance costs, including payment for "1st level" maintenance. Experience to date is not adequate to ascertain whether Associations will be able to assume amortization of pumpsets in the near future.

4. AID should include in the proposed FY 86 "Rural Sector Assessment" a more detailed analysis of policies and the institutional framework surrounding potable water and agricultural water. Current differential price structures on GOT irrigation schemes --Irrigated Public Perimeters (PPIs) and AICs -- and for potable water --SONEDE and the experimental Associations-- may lead to problems in the future if the issue is not addressed soon.

5. The current CTRD Water Policy criteria should be revised to reflect at a minimum inflation but more importantly changing needs and experience to date in the 0312.7 project. Two person months of consulting assistance is provided in the budget for assistance in such a revision following the completion of the Water Resources Mapping Study. The revision should specifically define criteria for extensions as well as new installations.

6. Finally, AID should implement the monitoring and evaluation plan outlined in the PP at Section 6.

Quantitative goals --e.g. number of Associations progressively picking up costs each year-- cannot be established or monitored unless the data are available. If the implementation plan is followed, the 1987 evaluation should be able to provide better guidance on the extent of cost recovery possible.

ANNEX F

INSTITUTIONAL ANALYSIS

1. INTRODUCTION & METHODOLOGY

The purpose of this Annex is to analyze, propose alternatives, and recommend an approach to improving the current and future performance in planning, implementing, operating and maintaining rural potable water systems in Central Tunisia. The Annex begins with a brief description of the approach used, followed by a summary discussion of the roles and functions currently involved in the process, followed by an analysis of options considered and recommendations for change. It should be noted that much of the original analysis was based on an assumption of a project duration of only 30 months. The extension to five years was only agreed upon 3 weeks into the design process. Some options that might have been pursued under the 5 year scenario had been rejected during consideration of a 30 month period, and the design time frame did not permit reanalysis. This was a regrettable omission of the design.

The Design Team arrived in Tunis in the Summer of 1985 with the mandate to "provide guidelines for creating, staffing and supporting a regional service responsible for planning, operating and maintaining water systems." (SOW from PIO/T 664-0312-3-30039). Given the background documents and some preliminary discussions in Washington, the team assumed it would focus on the need for improved regional water resources planning, and the need for some sort of institutional home for the nascent water user associations.

Initial discussions with both AID and GOT officials the first week, however, revealed that in fact the concept of "planning, operating and maintaining" included everything from site selection, drill rig scheduling, civil works design, construction monitoring, and administration of donor agreements to organization and training of water user associations, "second level" (major) maintenance, and finance and administration of the above. The team was also asked by both USAID and CTDA to propose staff for the new institution. (It must be noted that the CTDA personnel currently involved in the CTRD Rural Potable Water Project were all uninterested themselves in being part of this new institution).

This vision of what came to be known as "entity X" was quite different than documents and preliminary discussions had suggested, and the team was required to adopt a different strategy and methodology than it had originally planned. The

51

first step was to discover how each of the key AID and GOT actors defined the existing need. Intensive, one-on-one discussions were thus held with key AID and CTDA staff involved in rural water supply, and the following preliminary conclusions were reached:

- 1) A consensus exists at the national and regional levels of the GOT, and at AID, that there is a need for attention to institutional issues in the rural water supply sector in Tunisia, particularly regarding "end use" operations and maintenance in rural areas; and
- 2) There is much less consensus about the exact functions, let alone structure, that are at issue.

The team thus began this task at the basic levels of defining the need based on a simple structure/function analysis. This descriptive work was supplemented by a limited time-budget study of the two key project elements identified by all concerned as not operating efficiently: the TH-60 drill rig, and the CTDA office charged with project management, Amenagement Hydro-Agricole, or AHA. The results of the drill rig analysis are found at Annex G, Technical Analysis. The results of the AHA investigation will be discussed in Section 3.2.4 of this Annex.

Following the investigations above, the team outlined alternative approaches to water supply management identified as "Maximum GOT" (the (SONEDE model or a model similar to Water Authorities in a number of countries); "Maximum Citizen" (a model similar to Municipal and County Water Boards in the Western United States); and a "Mixed Model", similar to what is evolving in Kasserine today. The team held another round of discussions with all of the key actors in the AID-funded effort as well as with other interested parties, notably the Programme de Developpement Rural (PDR) and SONEDE. Genie Rural in Kasserine was only contacted once, which was perhaps unfortunate, but the approach discussed at that time was so static that further discussions were not a high priority. In these discussions, the team tried to elicit further information on functional responsibilities, structural relationships, staffing and budget as well as ideas on what an "entity X" in water supply in Kasserine would do (i.e. function) and what it would look like (i.e. structure). With those who were interested, further points on "entity X's" probable staffing and budget were explored. Final meetings with AID and the CTDA/PDG were held to narrow down the options. The summary results of the analysis and the conclusions follow.

## 2. ORGANIZATION & FUNCTION

The current process for identification of needs, site selection, and actual installation of a deep well in Kasserine is presented at Figure 2 in the main PP. A summary of the organizational functions of each of the key actors in that process is found below.

### 2.1 CRDA

The Commissariat Regional de Developpement Agricole (CRDA) is the regional branch of the Ministry of Agriculture in Kasserine. It has delegation-level extension workers, and a number of regional divisions, including Land Tenure, Animal Production, Forests, Agricultural Production, etc. The two most important divisions for the purpose of this exercise are briefly described below.

#### 2.1.1 DRE

The Direction des Ressources en Eau (DRE) undertakes a fairly continuous program of hydrologic and hydrogeologic research to identify and characterize the water resources in Kasserine. DRE is a capable organization and generally well equipped to undertake this work. It benefits from having had one Director for almost 13 years, a hydrogeologist who actually did his graduate fieldwork on water resources in Kasserine. That person is now the Commissaire Regional of all of CRDA/Kasserine. He is thus the supervisor of the current Director of DRE, and maintains an active interest in the program. DRE is also responsible for issuing permits (notes d'implantation) and maintaining a log on permits issued for all public and private wells, both bored and dug. DRE appears to have excellent relations with all the other organizations involved in potable water supply, and appears to be respected by all. Its budget and staffing, although less than the Commissaire would like, is probably adequate to the level of effort currently involved.

#### 2.1.2 Genie Rural

Genie Rural is also under the Commissaire. Genie Rural is the agricultural engineering branch of the Ministry of Agriculture, and has historically been the sole agency responsible for planning, implementing, operating and maintaining rural potable water activities. It also undertakes other rural works, such as farm-to-market roads, construction of government office buildings, etc. In Kasserine it currently has a staff of 8 engineers or assistant engineers and a Director, who is himself

an engineer. It appears extremely well equipped in relation to other offices, with a total of 8 vehicles for these 9 people. The Director stated that his budget for 1986-1987 for 6 water supply projects is TD 1.5 million, provided by the national government.

Genie Rural was responsible for supervising a Maintenance Brigade for rural public water points until 1982, funded through the Governor's Council budget. In early 1983 the Brigade was moved intact to PDR, so that the budget and staff would be under the same administrative authority.

Genie Rural, although well endowed with human and capital resources, and historically in charge of water supply, was not the choice of the original CTRD Rural Potable Water Project design team for the key management role. The team was unable to interview any of the people on the original team, but can posit that there were probably at least two reasons why CTDA was chosen for that role: 1) CTDA, as an autonomous agency of the GOT, has an autonomous budget that allows it great flexibility and ability to isolate and report on donor funds easily; 2) USAID/Tunisia had made a commitment to developing the role of CTDA as the major regional planning and coordinating institution in Central Tunisia. There exists now a belief that Genie Rural is too traditional, and that its water systems are too expensive and overdesigned for the area, a belief which may have entered into the early design as well. At any rate, what has evolved is an understandable organizational friction on the part of Genie Rural towards CTDA. From the Genie Rural perspective, CTDA is likely viewed as trying to duplicate its own efforts and subverting resources that could be going to Genie Rural.

## 2.2 SONEDE

SONEDE, although also under the Ministry of Agriculture at the national level, is an autonomous corporation of the GOT and independent of CRDA in the region. SONEDE/Kasserine is administratively responsible for 12 water systems in the urban towns and larger clustered villages in the Governorate. The office reports to a higher level in Sousse for administrative and technical direction. In Kasserine, SONEDE maintains a small branch office with a maintenance brigade of 4-5 trained mechanics that are sent out to repair broken meters or taps and to install new ones. Each of the 12 community offices is staffed with two people, one to work the pump and one to read meters.

The SONEDE Director in Kasserine was not up to date on the pace of the IBRD 7th Loan for expansion. Discussions with SONEDE in Tunis provided a list of some 47 potential sites for SONEDE takeover and/or development, 39 which may be taken up

progressively over the next 6 years as more detailed studies are completed. SONEDE is currently in the preparatory phase of the Loan project, assessing organizational and financial options for its rural expansion program. The two key points about the program are: 1) SONEDE will definitely move into rural Tunisia beginning in about 1987, and hopes to provide 95 percent of the population with potable water by the year 2000; 2) SONEDE is still not entirely sure what form its rural organization will take, but should know by June, 1986 at the latest. One of the options is to work through water user associations in rural areas.

### 2.3 PDR

The Programme de Developpement Rural (PDR) is the operational wing of the Governor's Council charged with planning, implementing and maintaining rural works of a level smaller and less complicated than those carried out by Genie Rural. Genie Rural appears, however, to implement some of the PDR water systems on its behalf. The PDR budget is about TD 2 million each year for its regular works on behalf of the Governor as well as the newer "Programme de Developpement Rural Intégré" (PDRI). Of current importance is an "Algerian Frontier Program", in which 3 communities in western Kasserine will benefit from improved water systems this year. The Director stated that about half of the annual budget usually goes towards installation of new water points, and about 5-10 percent towards maintenance. He further noted that the PDR programs are meant to complement and not supplant the work of Genie Rural, CTDA and SONEDE. The PDR office in Kasserine is staffed by approximately 6 mid-level functionaries. The Director is an engineer, although apparently this is not a requirement for the job.

Maintenance of at least 40 motorized rural water systems in Kasserine is carried out by the Maintenance Brigade that PDR inherited from Genie Rural in 1983. The Brigade consists of 11 skilled day laborers with one Land Rover. It maintains a small storehouse at the Regional Equipment Park which appeared well stocked but poorly organized. The Brigade Chief maintains the inventory in his head. The Brigade operates on a response mode, that is, it does not visit a water system unless someone (usually the Omda or Délégué) calls or cables PDR that one is broken. The salaries of the Brigade and the costs of fuel, oil, guardian-pumpists, and small repairs (literally nuts and bolts) are paid by the PDR. Larger repair costs are funded by the Governor's Council budget directly, although the administrative supervision is carried out by PDR.

## 2.4 CTDA/AHA

The Central Tunisia Development Authority, or CTDA, is also under the Ministry of Agriculture, but like SONEDE, is an autonomous corporation with a Board of Directors. The office charged with implementation of the AID-funded CTRD Rural Potable Water Project is currently called Amenagement Hydro-Agricole, or AHA. The current structure of the office is:

- A Directorate, (not so called by the Tunisians, but useful for describing the roles) which is composed of 2-4 people, with one primary Director; the Director is a hydrologist, one person (the current designated manager of the AID-funded project) is a mechanical engineer, and the two others are assistant engineers; the Directorate manages and implements the AID-funded potable water project;
- An office for Private Sector Assistance and Credit, composed of two assistant engineers, which is responsible for monitoring and implementation of the AID and IBRD-funded credit for private surface wells;
- An office of Studies and New Works, staffed by one engineer, an assistant engineer, and two topographers, with responsibility for supervision of the small irrigated perimeters (the PPI) as well as surveying and designing site plans for both the irrigated perimeters and the potable water systems;
- An office of Infrastructure, with one assistant engineer and two technicians, which is responsible for the AID-funded Rural Health Project and a number of miscellaneous construction activities, including feeder roads, electrification, and buildings; and
- A Maintenance Brigade, with two mechanics and one electrician, which is responsible for maintaining the pumps on all the irrigated perimeters, and which occasionally assists in maintenance of potable water supply on demand.

The work of AHA is generally done through contracts with construction contractors from Kasserine and nearby governorates, although occasionally it has contracted with larger firms from Tunis for both analysis and A&E work. AHA is supported by a secretarial pool and by the CTDA's Division of Administration and Finance (DAAF). The Director of AHA reports directly to the CTDA President Director General (PDG).

The organization above is responsible for the administration of approximately TD 3-4 million each year in donor and GOT funds, much of which is from AID. While the staff appear competent, they are clearly overworked.

The IBRD has engaged a Tunisian management consultant to undertake a lengthy phased study of the management of CTDA, with particular emphasis on administration and finance. The consultant has undertaken a detailed functional analysis, and proposed a new organization for CTDA which is found at Figure F-1. Under this proposal, AHA would now be called "Travaux Neufs et Maintenance", with the rural potable water project activities falling under the auspices of the office of Assistance and Credit. (Actually, the consultant report does not discuss the rural potable water project as a function; the team was told that it would fit there by the current AHA Director). It was not clear during the design when or if the CTDA was planning to adopt the proposed organizational plan.

## 2.5 Private Sector

### 2.5.1 Commercial For-Profit Institutions

The private sector in Kasserine encompasses a wide spectrum of institutions, ranging from a major paper production plant to individual artisans who operate as cement masons and mechanics out of their homes. The formal sector is registered and, at least in Kasserine and Sbeitla, organized into municipal "Young Chambers of Commerce" for mutual benefit. The informal sector is less organized, although a new PDR-implemented "Program for the Employment of Youth" may lead to more structure. Figures on numbers of various types of enterprises and capitalization within the formal sector were not available during the design.

This private sector is actively engaged in support of the provision of potable water in rural areas:

- For the design and/or site adaptation of standard designs of water systems, both Genie Rural and CTDA have used private A&E firms or individuals. PDR assigns such work to Genie Rural, and since water supply is SONEDE's sole function, it undertakes design itself out of its Sousse office. The decision on whether to do the design in house or contract it out appears to be made on a case by case basis, probably based on size and complexity of the site.

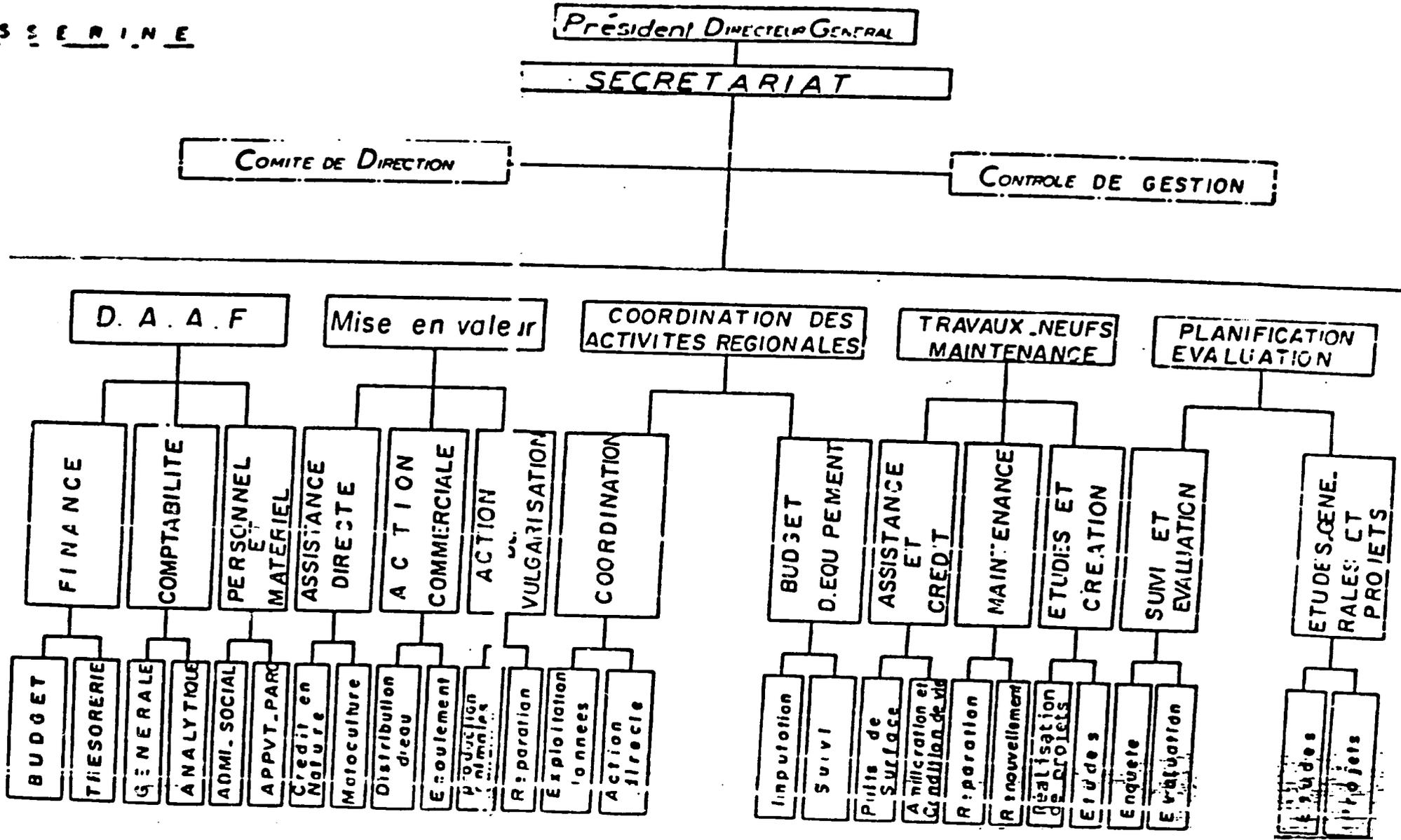
- During installation of water supply systems, private sector construction contractors (for civil works) and suppliers (for pumpsets) are commonly used by Genie Rural, the PDR, SONEDE and CTDA. Only PDR and Genie Rural do any work at all through force account, and this is below 10 percent of their overall activity. Most of the contracts go to firms in the Kasserine Governorate, although some go to firms from neighboring areas. Performance by the firms is mixed, with a predictable number of work slowdowns due to underbidding contracts, particularly for civil works. Equipment suppliers seem somewhat better, although they are slow as well. The CTDA uses a penalty clause in all its contracts but by Tunisian law it cannot deduct more than 10 percent of the total as a penalty for up to one year. There is thus little incentive to invoke the penalty, as CTDA would have to wait a year to hire another contractor. Persuasion and direct assistance, through providing transport, for example, seems to be the preferred means of enforcement. Figures were not available on exact numbers of contractors used; it is known that one major supplier provided and maintains parts for at least 800 private surface well pumpsets. Some of the suppliers provide initial training to the designated guardian-pumpists in basic operation and maintenance.

- The private sector is also actively engaged in operations, maintenance and repair. The PDR has maintained a time and materials contract with at least 3 suppliers for the last few years, under which the Maintenance Brigade can access parts quickly without unnecessary administrative delays. Certainly the suppliers are used to supplying and providing parts for the 2600 motorized private surface wells in Kasserine. Construction of these, however, is generally done through the informal sector, with the farmer hiring a local mason and mechanic to help him. Again, exact figures are not available as to gross revenues from this operation, but apparently the supply of goods and services is keeping up with demand.

- The informal private sector is active in operations and in distribution of water. Guardian-pumpists generally go to the headquarters of the delegation for periodic fuel replenishment, and must hire transport to get the fuel to the site. They also may call upon local mechanics to assist in very minor maintenance, such as replacing a broken bolt or tube. Finally, as discussed in Annex H, Social Analysis, rural central Tunisia has an active informal private sector engaged in the transport and sale of water from public points to consumers. As noted in Annex H, prices charged appear to equal the opportunity cost to the consumer for his or her time.

54

FIGURE F-1



### 2.5.2 Non-Profit Private Sector: Water User Associations

As described in the Social Analysis, the new Water User Associations in Kasserine are not entirely "private sector", in that they are operating under the wing of the party due to lack of an official status for collecting and disbursing money. Further, they are supported by a series of committees made up of GOT personnel at the Local and Regional levels. In that the intent of their existence is that they become self supporting, they are included in this section of the paper.

Water User Associations are composed of consumers living in the radius of use of a water distribution point. Their current initial organization is heavily weighted towards educated GOT functionaries, including teachers and nurses. People living near approximately 150 water distribution points, including springs and surface wells, have been contacted regarding the desirability of creating a Water User Association by a consultant retained by the CTDA for this purpose in collaboration with Local Committee members. As of August, 1985, approximately 40 Associations had begun collecting funds for operations. It is estimated that approximately 5 of these are actually maintaining accounts with the controller at the Délégué's office. The controller reportedly maintains separate line item accounts for each association and does a paper transfer when a guardian-pumpist comes in with funds and requests a "bon" to buy fuel. The Delegates involved (in Sbeitla and Foussana) have not stopped receiving their allotment for this purpose from the PDR, as these developments are quite recent. It is assumed that although these allotments may be reduced, they will be continued for some time.

The proposed organization of the WUA is discussed in Section 4 below.

### 3. CONCLUSIONS

The preceding summary of institutions involved in rural potable water supply in Central Tunisia, when read with an understanding of the process as outlined at Figure 2 in the main PP, provides the background for the conclusions and proposed recommendations. Three major contextual factors only indirectly related to this process are included:

- AID strategy in Tunisia includes a major emphasis on "further strengthening Tunisian institutions which AID has previously assisted". The team was provided a predisposition towards CTDA as the key managing entity both

98

verbally and through action: it was sent to Kasserine with only 1 full working day in Tunis, and in fact had to cancel a planned meeting with SONEDE/Tunis to meet that schedule. Thus, although the alternatives discussed below were considered, there was a known preference at AID for continued involvement of CTDA.

- The GOT is more than matching the IBRD \$ 50 million Loan contribution towards expanding SONEDE into all rural areas. SONEDE is a reportedly well-managed and efficient organization. It is expected that SONEDE will do what the plans state (although this should be monitored carefully). Given the level of resources already committed to SONEDE for this purpose, no additional funding is proposed at this time.

- The GOT is in the midst of a major austerity campaign aimed at decreasing administrative overhead and recurrent costs. The CTDA was authorized only 8 additional positions in 1984 (4 extension agents and 4 drivers), none in 1985, and has proposed only 2 or 3 for 1986, which it hopes it will get. No one interviewed felt that it was likely that, given these conditions, the GOT would authorize the creation of positions or a budget for an entirely new regional water service.

With these caveats, the following seem to capsulize the current situation:

Rural Tunisia is in a structural transition period regarding rural water supply, and a new regional service is not indicated at this time. The creation of a new service outside the SONEDE strategy would be an extremely inefficient use of human and financial resources. In addition to eventual institutional redundancy, a new institution runs the risk of absorbing all recurrent costs saved as the people begin to financially support their systems.

An interdepartmental office is also not indicated as an efficient or likely means of planning, operating and maintaining rural water supply. Although several Tunisian functionaries interviewed suggested the idea of interdepartmental staffing of an "entity X" as a means of meeting the GOT austerity requirements, none interviewed expressed an interest in being part of such an entity. There exists strong loyalty to professional service and careers in Tunisia, and it is doubtful that an

8/9

interdepartmental agency would function well even were it able to attract staff (or have reluctant staff appointed). Other interdepartmental efforts in Tunisia or elsewhere could not be identified that have succeeded in building this professional commitment over time, other than short-term single function task forces.

The current system is in fact not particularly inefficient given the context in which it operates. The several different organizations involved in rural water supply actually meet a number of needs or agendas, which it would be very difficult for one agency to fulfill. Genie Rural and the PDR install systems based on demographic criteria and political expediency. SONEDE looks at cost effectiveness above all else. CTDA, with AID funding, is able to balance the political with a more sincere attempt at objective criteria. The private sector firms and individuals are equally responding to demands, only at different levels. Given the environment, the system is not inefficient.

The installation system under the AID-funded project is slow due to a number of identifiable problems which can be partially resolved. As discussed in the Technical Analysis, provision of a few vehicles and water quality testing equipment to the drilling crews so that the need to communicate with DRE is reduced, and when required, can happen quickly, will enhance drill rig efficiency. Much down time on the rig is now due to the long wait while people take a tractor or other inappropriate and slow means of transport in to seek advice. The construction of civil works and equipping of wells can also be hastened, by reinforcing the extremely overburdened staff of CTDA/AHA with a private sector A&E firm. The staff simply has more work than it can possibly handle well, and A&E assistance in design adaptation, and bid preparation, in addition to site monitoring, should help alleviate some of this overwork. This approach is particularly appropriate given the transitional structural period noted above, as it does not add to the GOT's recurrent costs. Using the private sector also responds to AID mandates. This approach, in fact, is already being used on the AID-funded CTRD Rural Health Project (also managed by CTDA/AHA) and on a housing project.

A new water-related agency might be justified in terms of structure and function if it included a planning and policy function for agricultural as well as potable water. Although it was beyond the design mandate to investigate irrigation, during conversations it became apparent that

100

there are a number of potentially contradictory policies being promoted by a number of different structures which bear investigation. The people who use a well are not aware that the water they use is designated for one or the other, and they may have different ideas about what water is better suited to a specific purpose. DRE is performing capably in regulating agricultural and potable water from a hydrologic and conservation standpoint. USAID might consider including a comparison of policies and practices on irrigation water as compared to those on potable water in its forthcoming Rural Sector Assessment. Under these terms, the model of a "Water Authority" is one whose time may have come in Central Tunisia.

#### 4. RECOMMENDATIONS

Section 1 of this Annex mentioned three broad models that were used in the design process to pursue the identity of "entity X". Figure F-2, taken from a new AID handbook on designing rural water projects, actually provides four alternatives, the middle two representing variations on what was called "Mixed Model". The Figure is provided not to present the model for Tunisia, but to demonstrate that no model or approach to rural water supply is entirely free from disadvantages. USAID/Tunis' experience with the CARE/MEDICO wells of the mid seventies, for example, fits the first scenario quite well, and the private surface well construction in Kasserine fits the fourth. This Annex, and the PP, recommend that USAID fund a modification of scenarios II and III (what Part 1 of this Section called the "Mixed Mode") during the proposed project.

Specific recommendations follow:

##### 4.1 Water User Associations

The major institutional innovation proposed in this project is the development and reinforcement of the nascent Water User Associations currently being created. Proposed functions of the WUAs include:

1. to raise money to cover operations and maintenance costs, including fuel, salary for the pump operator, basic maintenance, and site sanitation and improvements;
2. to undertake sanitation activities around the pump site, and to provide input into certain civil works design features, including location of the animal trough and the spigots where people fill their tanks and other containers, and the location of the reservoir;

FIGURE F-2

Table 7. Alternative Institutional Arrangements

LIKELY CHARACTERISTICS	I. Internal Agency Responsible for All Planning, Design, Implementation, O&M	II. External Agency Plans, Designs, Supervises Construction; Community Provides Labor, Local Material, & O&M	III. External Agency and Community Share Responsibilities for Planning, Design, Implementation, O&M	IV. External Agency Provides Limited Technical Assistance to Community
CONSTRUCTION	<ul style="list-style-type: none"> <li>- Well-organized</li> <li>- High quality</li> <li>- Expensive</li> </ul>	<ul style="list-style-type: none"> <li>- Slower than I.</li> <li>- Less quality control than I.</li> <li>- Cheaper than I.</li> <li>- Rarely performed</li> </ul>	As in II.	<ul style="list-style-type: none"> <li>- Low-quality materials</li> <li>- Limited construction capabilities</li> </ul>
ROUTINE MAINTENANCE	<ul style="list-style-type: none"> <li>- Nonexistent</li> </ul>	<ul style="list-style-type: none"> <li>- Rarely performed</li> </ul>	<ul style="list-style-type: none"> <li>- Perhaps some done by trained community members</li> </ul>	<ul style="list-style-type: none"> <li>- Rarely performed</li> </ul>
MAJOR REPAIRS	<ul style="list-style-type: none"> <li>- Competent staff stretched between many needs</li> </ul>	<ul style="list-style-type: none"> <li>- Not made because of lack of skills, tools</li> </ul>	<ul style="list-style-type: none"> <li>- Done by external agency</li> </ul>	<ul style="list-style-type: none"> <li>- Rarely performed</li> </ul>
FINANCIAL	<ul style="list-style-type: none"> <li>- All costs paid by external agencies out of central funds</li> </ul>	<ul style="list-style-type: none"> <li>- Agency pays for planning, design, imported materials, construction supervision</li> <li>- Community pays for local labor, materials, O&amp;M</li> </ul>	<ul style="list-style-type: none"> <li>- As in II, except agency may pay portion of major repairs</li> </ul>	<ul style="list-style-type: none"> <li>- Agency only funds technical assistance</li> </ul>
EXTENT OF TRAINING	<ul style="list-style-type: none"> <li>- Trained agency staff</li> </ul>	<ul style="list-style-type: none"> <li>- Trained agency staff</li> <li>- Community may be trained in maintenance or health education</li> </ul>	<ul style="list-style-type: none"> <li>- Trained agency staff</li> <li>- Community trained in simple maintenance, request</li> </ul>	<ul style="list-style-type: none"> <li>- Trained agency staff teach, share their knowledge at community level</li> </ul>
COMMUNITY PARTICIPATION	<ul style="list-style-type: none"> <li>- Minimal, only advisory as determined by responsible agency</li> <li>- Complete after construction</li> </ul>	<ul style="list-style-type: none"> <li>- Nonexistent prior to construction</li> <li>- Some during construction</li> </ul>	<ul style="list-style-type: none"> <li>- Community participation throughout all phases of project</li> </ul>	<ul style="list-style-type: none"> <li>- Complete community control</li> </ul>
ADVANTAGES	<ul style="list-style-type: none"> <li>- Administratively clear responsibility</li> <li>- Technically efficient</li> <li>- Rapid production</li> <li>- Competent repair staff</li> </ul>	<ul style="list-style-type: none"> <li>- Cheaper than I.</li> <li>- Higher potential for community development than I.</li> </ul>	<ul style="list-style-type: none"> <li>- Greatest potential for appropriate design</li> <li>- Greatest potential for community development</li> <li>- Greatest potential for efficient O&amp;M</li> <li>- Least cost to agency</li> </ul>	<ul style="list-style-type: none"> <li>- Greatest degree of community control</li> <li>- Widest coverage with limited technical resources of agency</li> </ul>
DISADVANTAGES	<ul style="list-style-type: none"> <li>- Greatest risk of inappropriate design</li> <li>- Expensive</li> <li>- Limited potential for community development</li> <li>- Health risk of failure after construction</li> </ul>	<ul style="list-style-type: none"> <li>- Slower, technically less efficient than I.</li> <li>- High risk of failure due to inadequate maintenance and repair</li> <li>- High risk of inappropriate design</li> </ul>	<ul style="list-style-type: none"> <li>- Slowest most expensive planning</li> <li>- Poor definition of administrative responsibility</li> <li>- Potential conflict over decision-making/financing</li> </ul>	<ul style="list-style-type: none"> <li>- Scope limited by funds available to community</li> <li>- Recurrent O&amp;M problems</li> <li>- Limited potential for hygiene education</li> </ul>

MAR 17 1965

3. to undertake health education, in conjunction with the health education program of the public health service; and

4. to maintain site discipline, to organize labor inputs, and to settle disputes concerned with drawing and hauling potable water.

It is recommended that USAID and CTDA work with the Governor's Office and Genie Rural over the next year to assure that an interim official status be afforded the WUAs, so that they can have independent post office accounts and collect and disburse funds. It is recommended that this status be considered interim due to the experimental nature of the WUAs to avoid a hastily written and possibly burdensome set of regulations.

The members of the WUA will be those individuals or households who habitually take water from the water point. Each member of the WUA will make a contribution in money and possibly labor to be used for operations and maintenance, repairs, and improvements.

Based on experience to date, it is recommended that each WUA be allowed to have a slightly different system of payment. Each WUA should be able to collect and administer its own funds, keeping such records as are necessary for accountability, and maintaining the account at the local post office.

It is recommended that each WUA have a managing committee including representatives of all social and economic categories in the population served. Creation of this sort of representative organization will require considerable work, as this is a new form of social organization for Central Tunisia. A support office for this purpose is described below.

#### 4.2 Unité d'Autogestion

It is recommended that a small, four person office/service be established under the CTDA for the purpose of supporting--indeed, nurturing--the new Associations. For the purposes of discussion, this office is called the Unité d'Autogestion in this paper. The four people would be a Grade A officer who would be the Director, and 3 Grade B officers who would be extension/community development workers, with one focusing almost exclusively on training. The GOT desire to keep recurrent costs down is recognized, and consequently the minimum staff possible is recommended. Given the assumed number of 90 motorized water points with associations, in optimal conditions these four people would be able to visit each Association once

each month. It is important that these people have a social science background, either advanced training in sociology or community development or experience in social work or public health. The office should have adequate vehicles and equipment to do its work.

It is recommended that the office be established soon after signing, and a Condition Precedent has been included at Section 7 of the PP. Assuming that some staff would be in place by April, it is appropriate to include two months consultancy time of a person with extensive experience in local participation in water supply management to work with the office. This consultant would help the new Unit establish methodology for initial and subsequent contacts with new groups, for monitoring, and for training. S/he would also work with the Unit to develop their annual workplan. Repeated one month visits are planned each year for the consultant, for follow up and training.

Funding for short-term training is also provided for staff of the Unit. The consultant will be able to make recommendations upon his or her assessment of staff competencies and needs.

Although a number of options were considered, it was finally agreed by the CTDA that this Unit should report directly to the PDG. There are advantages and disadvantages to this organizational location, but it was agreed that if the staff were supervised by the engineers of AHA, the community organization strategies might get overturned by the technicians. Given the as yet undetermined future profile of the CTDA organization as viewed by the IBRD-financed management consultant, this placement may be viewed as the most logical in the short term. As the consultant's views are adopted or adapted, a different placement may seem more logical.

This organizational placement presents one of the more difficult potential problems with the system being proposed. It will mean the Directors or Chiefs of AHA and the Unit will be equals, and will have to cooperate to achieve the desired results.

Although problems are not anticipated given personnel currently in place and the general "ambiance" of the CTDA, both the PDG and USAID should monitor the relationships and be prepared to step in if conflicts arise. It is not an ideal solution, but it is the one arrived at by the CTDA and supported in this design.

#### 4.3 Linkages

Careful attention will have to be paid not only to the linkages within CTDA, but also with the several other institutions involved. The basic support and operations structure for the WUA would be:

- The site-specific Water User Association;
- The Local Potable Water Committee at the delegation level;
- The Regional Potable Water Committee;
- And perhaps an Association of Associations, either at the delegation or Governorate/Regional level.

These essentially voluntary organizations (although the Regional "Groupement d'Intérêt Hydrique" is theoretically mandated by law) will be supported on the organizational and training side by the proposed Unité d'Autogestion, and on the technical side during installation by the CTDA/AHA and during operations by the PDR Maintenance Brigade as supplemented by the private sector (or, in some areas, vice versa). In addition, the Regional Directorate of Public Health will provide inputs in health education and sanitation. A brief description of roles follows:

1. The WUA will be responsible for on-site management, including covering running costs and maintenance, as well as taking on responsibility for health education and sanitation programs. Each WUA will be in touch with the Unité and, if such is created, an Association of Associations. Ideally the WUAs would be represented in some way on the Regional and Local Potable Water Committees. The WUA would maintain contact with its Local Potable Water Committee, perhaps through a liaison officer or the presiding member, to arrange for assistance as needed.
2. The Local Potable Water Committee, composed of teachers, nurses, CTDA sub-division chiefs, and other delegation level personnel would be in a position to offer technical advice and assistance to the site specific WUA. It would receive guidance from the Regional Committee, and would be the correct organization to offer advice to the WUAs on such policy issues as site selection, site improvement, and rates to be charged.
3. The Regional Potable Water Committee will be responsible for overseeing all policy issues related to potable water,

including the choice of new sites for drilling or extensions, issues relating to the setting of fees, oversight of the maintenance process, etc. Its permanent secretariat, in a manner of speaking, will be the Unité d'Autogestion in the CTDA. The linkage to the Local Committees would thus be facilitated through the CTDA sub-division chiefs.

4. The Unité d'Autogestion will have primary responsibility for creating and backstopping the WUAs. It can provide the link between the WUAs and the AHA during installation and the Maintenance Brigade during operations. It will be in direct contact with the members of the Regional Potable Water Committee, and will also offer training and advice to the Local Committees.

5. The CTDA/AHA will collaborate with the Unité to ensure that WUAs are formed as a precondition to a new water system, and will work with the WUAs during civil works design. It may also serve as a technical assistance source for site development activities, including minor irrigation, drainage problems, and vegetative cover.

6. The Maintenance Brigade of the PDR will be reoriented with assistance from U.S. and Tunisian advisors to undertake preventive maintenance checks and on-the-job training of guardian-pumpists. The PDR is a member of the Regional Water Committee, which should facilitate these linkages.

7. Finally, the Regional Directorate of Public Health, through its Regional and delegation level personnel, are and will continue to be active on Regional and Local Committees and will provide assistance and training to WUAs in health and sanitation efforts. A small budget is provided in the PP to assist the Directorate in this regard, and technical assistance is provided on an annual basis to upgrade staff skills and assist in planning programs.

Committees are generally unwieldy and slow acting and the design has taken this into account. Given the experimental and relatively high risk nature of the task--getting people to pay for water who have previously gotten it free--widespread support is necessary. The non-linear nature of this institutional array, given the strong and proven technical abilities in Kasserine, should allow for the WUAs to evolve without unnecessary false starts. ~~The GOT support for the experiment exists; it now needs the means (training and monitoring) to run its course.~~

ANNEX G

TECHNICAL ANALYSIS

1. PROJECT TECHNICAL ASPECTS

The proposed project is, in principle, a continuation of the CTRD Rural Potable Water Project with respect to technical activities. Hand-dug wells, springs development and deep bored well water points constituted the bulk of the previous project. The proposed project is designed to include up to 30 deep well water points, four (4) extension water points, two (2) individual house connection systems, and a component of research activities.

In the course of preparing this document approximately three (3) weeks were expended in the Kasserine - Central Tunisia region observing field activities, visiting water points in various stages of completion, collecting pertinent information and discussing project findings. An additional week was spent in Tunis preparing and presenting document information.

This annex is divided into two major sections; the first relating basically to technical considerations and the second to cost estimates with supporting information.

All information contained herein has been reviewed for completeness of content by IDA team members and integrated with other project findings as presented in the project paper.

1.1 Project Deep Well Construction

1.1.1. CTRD Rural Potable Water Project Well Construction:

The CTRD Rural Potable Water Project (June 1980) water well construction resulted in the completion of 17\* bored wells; 14 of which were completed for water supplies and 3 found to be dry or otherwise not useful as water sources. Two general well designs were employed in well construction:

- 9 5/8 - inch diameter production sections and 9 5/8 - inch diameter screened sections in 15 1/2 - inch diameter reamed bores.
- 9 5/8 - inch diameter production sections and 6 - inch diameter screened sections in 15 1/2 and 12 1/2 inch diameter reamed bores respectively.

\*/ An eighteenth hole was drilled; however due to construction errors, USAID did not reimburse for it and it is consequently not included here.

Three drilling rigs were utilized for well construction; a Failing 2500, a Franks 2000 and an Ingersoll- Rand TH-60. The Failing 2500 and Franks 2000 are conventional rotary fluid rigs while the IR TH-60 is primarily an air rotary rig with moderate capacity for mud rotary drilling. The Failing and Franks rigs are capable of conducting any well construction under the proposed project, while the IR, TH-60 is only marginally acceptable for drilling 15 1/2-inch diameter bores to 100 m depth.

Construction of the 17 wells required 39 rig months or an average of 2.3 rig months per well (See Table G-D). The average well completion rates reflect the rather cumbersome well construction procedures that have been employed in Tunisia for more than 20 years.

It is estimated that approximately 50 percent of each rig month is expended in mobilization, preparing crew camps, and waiting for transport, spare parts, design decisions, electric logs, etc. In addition, there is little incentive for rig crews to increase production rates.

Considering the construction procedures currently in place, it is expected that only a minor improvement in the average (maximum 200 meter) well construction rate can be implemented in the proposed project.

#### 1.1.2 Recommendations for Improvement of Deep Well Construction Rates:

A review of well construction and testing procedures indicates that the following items may improve the average rate of well completion in Central Tunisia.

- 1) Utilize the IR TH-60 primarily as an exploration rig. No ream bores of greater than 15 inches diameter to 100 m should be drilled with this rig.

The TH-60 is well suited to drill with 6 inch diameter bores using the down-hole hammer and button bits to 300 m using air. Good efficiencies can also be realized to 200 m using 8 1/2 inch diameter hard-rock tricone bits to the same depth using air. Acceptable, but marginal, efficiencies can be obtained to 200 m using 12 inch diameter hand-rock tricone bits. Considering the limitations of the TH-60 rig, the following drilling program using that rig is suggested:

105

-- a) The TH-60 should be used only in hard rock environments.

-- b) A 6 inch diameter air hammer or maximum 8 1/2 inch diameter air rotary test bore should be drilled to and through the aquifer zone to be produced.

-- c) On-site conductivity bridge water quality logs should be maintained during drilling of test (exploratory) bores when drilling with the TH-60 air rig. Such conductivity bridges are simple to operate and maintain and can yield continuous down-hole composite water quality data. Such data is useful in well design decisions. Waiting time for a decision to proceed with a well may be reduced by the several days it may take to conduct chemical analyses of water samples.

-- d) A water quantity log should be maintained by measuring water blown from the well as drilling proceeds. A simple 90 degree V-notch weir (cowboy) can be placed in the discharge stream from the well to measure changes in water quantities.

-- e) At completion of the test bore, an electric log should be made to determine potential aquifer zones and to be correlated with the water quality and quantity logs made during drilling of the test bore hole. Water samples should then be sent to a laboratory for chemical analysis.

-- f) If on-site electric, quality and quantity logs appear favorable, drilling of the 12 1/2 inch diameter ream bore should begin immediately. However, this should be done only if the drilling is within the capability range of the TH-60 rig.

-- g) If the on-site electric, quality and quantity logs indicate unfavorable conditions, or the well to be constructed is beyond the capacity of the TH-60, the rig should be immediately moved to another drill site.

-- h) Any wells to be completed of the typical design (Figure G-1) greater than 200 m in depth should employ a heavier rig than the TH-60. Thus, in some cases it could be necessary to move the TH-60 after the electric logging is completed, and then to set up a higher capacity rig at the test bore location to construct a well.

2) Provide the Central Tunisia region DRES with a slim-hole electric logger. Such logging equipment would provide rapid assessment of potential aquifers and prompt well design responses which could reduce rig site time by several days or even weeks, since the test hole drilling rig cannot leave a site before electric logging is completed.

The electric logging unit should be able to provide one spontaneous potential curve and two (2) resistivity curves. It should be van mounted for mobility and be capable of logging to a depth of at least 500 m. An electric logging machine is a relatively sophisticated piece of equipment which requires careful operation, maintenance and storage.

3) In order to improve communications and logistics between drilling sites and decision-making centers in Kasserine and elsewhere, a light pickup truck is recommended to be provided for each rig working on project wells. Most drill sites are expected to be within two hours drive of Kasserine or locations where telephone communication can be made with any place in Tunisia. The light trucks could also be used to transport spare parts, personnel (injured or otherwise), test bore samples, etc., without necessitating interruption of drilling activities. Such trucks would more effectively replace communications equipment (side-band radios) as recommended in earlier AID assessments, as well as fulfill a function in the well construction process.

4) Provide the Kasserine regional office of DRES with two (2) broad range, water quality conductivity bridges to be used in the field during test bore drilling using the TH-60. Proper field use of such instruments can provide continuous water quality information during drilling, using air rigs such as the TH-60. It is emphasized that these instruments should be maintained and used at the drill sites, not in offices in Kasserine.

## 1.2 Project Wells, 1986-1990

Water wells constructed thus far in the course of the AID Rural Potable Water Project appear to have been designed to exploit the optimum production available at each site. The 9 5/8 inch diameter production sections typical of the wells are of a diameter large enough to house 8 inch diameter pumps, which are relatively efficient for the lifts and quantities of water being produced. Screened sections of the well designs are based upon water production anticipated and the geologic environment of the aquifer zone(s). The well designs indicated are simple, practical and effective. In addition, Tunisian drillers have constructed similar wells for approximately 20 years, thus they are equipped to construct such wells.

### 1.2.1 Design Philosophy:

The design, in considering well design philosophy, has reviewed the technical and economic factors of the current designs (primarily production sections) versus new designs, with the following results:

1. The current well designs may be considered somewhat over designed in the production sections in the sense of simple watering points. However, future increased water demand at a well may result from (i) increased local populations, (ii) decisions to provide extensions to other locations at a later date, or (iii) a community expansion to town status which may eventually afford the SONEDE type of individual house connections. In some cases extensions are being considered at this time in locations of previously constructed project wells.

2. It is possible that community growth around some well locations will warrant a SONEDE system at some time in the future. At that time a current watering point could be outfitted for higher capacity production without the need to construct a new well.

3. Well production economics are such that smaller diameter deep wells (200 m) may not be cost effective when pumping levels, pump efficiencies and water production rates are considered. Efficiencies of operation of a 4 - inch diameter pump in a 6 - inch casing are generally not as good as a six or 8 - inch diameter pump in a 9 5/8 - inch casing, given the same total dynamic head (TDH) conditions. In essence, the operating cost per unit of water produced is lower with the larger pumps than with the smaller.

4. Well construction economics indicates that certain costs are relatively fixed in well construction, particularly in Tunisia. These include:

- Well site mobilization,
- Test hole drilling,
- Placement of casing,
- Logistics,
- Well development,
- Crew size,
- Well engineering (design),
- Electric logging.

The costs for the items indicated above will be essentially the same for an 8 inch diameter or 9 5/8 inch diameter cased well to a depth of 200 meters. The item costs for a 6 inch diameter cased well would be only slightly less than a 9 5/8 inch cased well.

Ream bore costs per meter increase only slightly from 6 inch diameter to 9 5/8-inch diameter cased water wells.

Casing costs (production sections) are on the order of three times as great for 9 5/8 inch as for 6 inch diameter. For 8 inch diameter the cost is approximately two times that for 6 inch diameter. Casing costs are therefore the most significant difference in well costs for the well dimensions noted.

In consideration of the above factors, it is the consensus that the present well design which incorporates 9 5/8 - inch diameter production sections and 6 inch diameter screened sections (See Figure G-1) is the most appropriate for proposed project wells.

### 1.3 Well Facilities

#### 1.3.1 Pumping Units

Under the Project the GOT (CTDA) is responsible for the selection, purchase and installation of well pumps, drive units, and well head facilities.

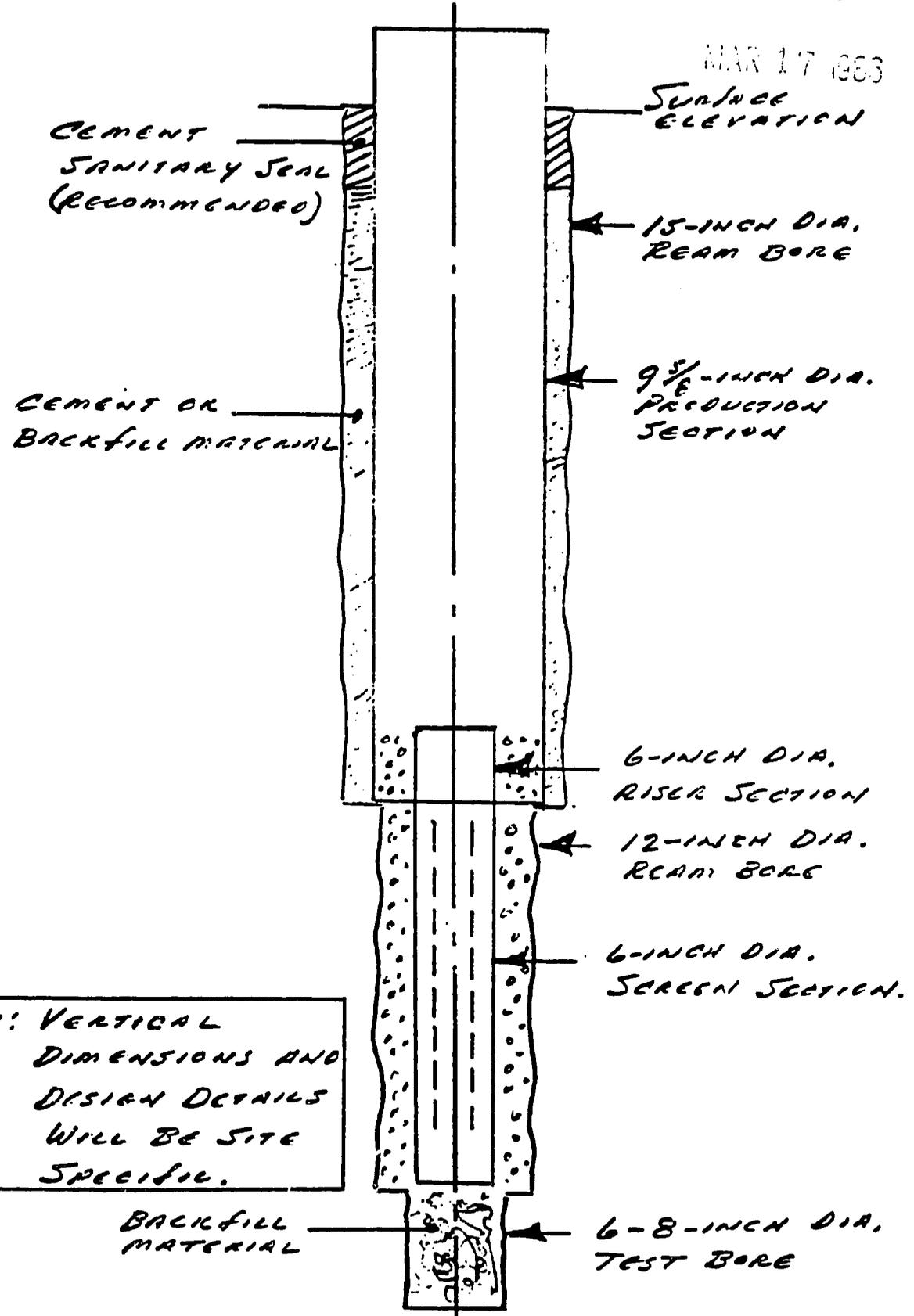
It was reported during the design that, after well test information is obtained from DRES regarding an individual well's potential production rate and pumping level, CTDA selects a pump capable of producing at a given rate under the known hydraulic conditions. The size (HP) of the drive unit is then matched with the pump and well head facilities (piping, valving, etc).

The equipment selected for well facilities is somewhat standardized with pumps and drives of four general categories, ranging from low to high-lift pumps with drives (engines) of appropriate horse power. The selection and design process used in the past appears rational in the sense of good engineering practice.

#### 1.3.2 Well Pump Operations and Recommendations

Considering the demand at watering points it has been observed that some wells are substantially over designed with respect to water requirements. This results in the necessity to repeatedly start and stop the pumping unit throughout each day to fill reservoirs and tractor drawn tanks.

FIGURE B-1  
TYPICAL WATER WELL CONFIGURATION  
RECOMMENDED FOR 1986-1990 PROJECT



NOTE: VERTICAL DIMENSIONS AND DESIGN DETAILS WILL BE SITE SPECIFIC.

- VERTICAL SECTION  
- NO SCALE

JTS 8/86

An overview of the well points indicates that longer production intervals using smaller rates of production could result in more efficient operations and lower equipment and maintenance costs.

It is recommended that consideration be given to limiting well production to an approximate maximum of 5 liters/second (l/s) for watering point wells regardless of the possibility of higher well capacity. Such a limitation could result in the following:

- Lowered pumping equipment costs,
- Reduction of stop-start frequency and its related increased wear on equipment,
- Reduced maintenance and operation requirements which would give the pumpist additional time for site control,
- Reduction of the temptation to utilize production for irrigation,
- Probable reduction in fuel consumption.

Some objection has been voiced by CTDA regarding the limitation of production rates on the basis of potential engine heat-up for longer run times. This argument does not seem well founded since most stationary diesel units are designed for continuous run, and usually the longer the more efficient. In any case the use of larger radiators would solve such heating problems.

#### 1.4 Civil Works Facilities (at well water points)

Facilities included at each well to complete a water point are as follow:

- o Pump house
- o People water point
- o Animal water point
- o Stand pipe
- o Reservoir
- o Piping, valves, fixtures for connecting facilities.

During the previous project, construction was initiated at 14 sites. Currently (August, 1985) these sites are in stages of completion ranging from approximately 50 percent finished to fully operational. At three (3) sites where dry or poor water quality wells resulted, civil works facilities initiated were discontinued.

The proposed project will require the installation of 30 civil works facilities at the same number of wells. As in the case of the wells, the locations of the new civil works facilities have not yet been determined.

Basic design criteria were formulated for well point facilities during the previous project and it is intended that such criteria will prevail throughout the proposed project (with minor modifications).

During the course of this Project facilities designs available at the CTDA office in Kasserine were reviewed. The following report section, 1.4.1, includes comments presented during the facilities designs review.

The one factor of design criteria unique to each well point is the site-specific conditions. Section 4.1.2 is included for the purpose of suggesting guidelines for facilities placement. However, actual distances between, elevations of and actual siting locations for facilities must be designed to accommodate the terrain at each water point.

Well point civil works construction is carried out by local contractors under the direction of CTDA. It is recommended that a Tunisian A & E firm (or individual) be retained on a time and materials basis to assist CTDA in advising contractors during preparation of bidding documents for specific sites. Further, the A & E engineer would advise the contractor regarding materials handling, construction techniques and work scheduling during construction. The A & E engineer would also monitor construction and prepare standardized monthly progress reports to be transmitted to CTDA, Kasserine, and USAID/Tunis. The latter function would be of value in determining schedules to be followed and problems to be avoided in the construction of subsequent civil works facilities for the 30 water points program.

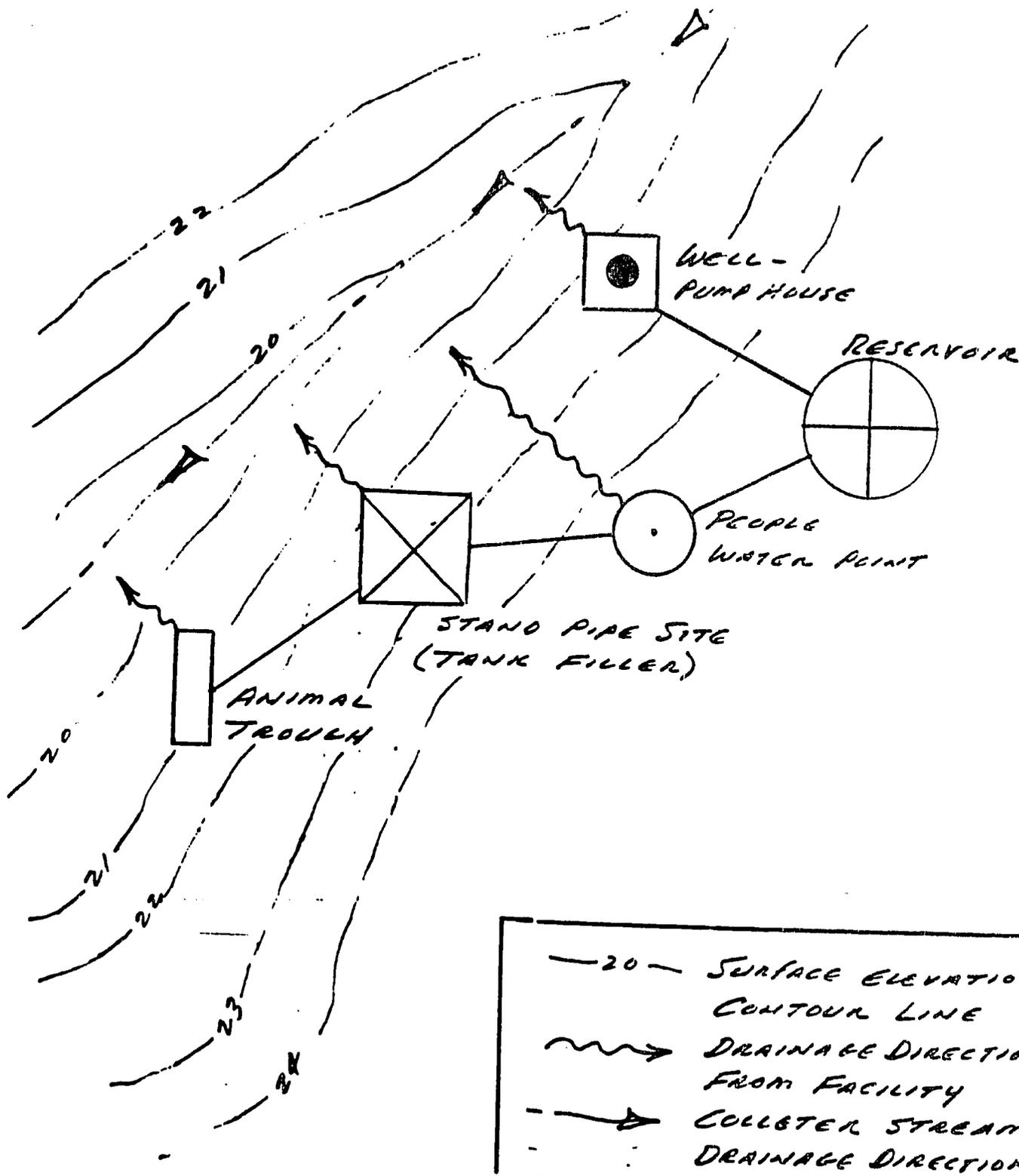
#### 1.4.1 Water Point Site Arrangements

Observations made at several water points have resulted in a generalized site arrangement which seems appropriate for most site conditions. The site arrangement recommended incorporates the following considerations:

- Site drainage,
- Health features (pollution),
- Priorities of water use,
- Control of site activities.

Figure G-2 depicts a model layout which could be adapted to most site specific locations. The suggested arrangement includes both linear and elevation (surface gradient) conditions as follows:

FIGURE 6-2  
SUGGESTED ARRANGEMENT FOR  
WATER POINT FACILITIES, 1986-1990 PROJECT



NOTE: DRAWING IS REPRESENTATIVE ONLY.  
EACH FACILITY WOULD BE SITE SPECIFIC.

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- Well location to be at a low point and at one end of drainage influence, and at one end of all other facilities,
- People water point (reservoir or other type) up gradient and out of drainage influence of other facilities,
- Standpipe (tank filler) down gradient from the human watering point and out of the drainage influence of other facilities,
- Animal water point (trough) linearly at the opposite end of the arrangement than the well, with drainage down gradient from all other facilities on the site.

It should be noted that although some sites appear relatively flat, there is usually a surface gradient that can be determined by a simple survey. In any case, no watering point should be located in an area of centripital drainage. Drainage conditions at facilities are by far the most serious adverse factors which currently prevail.

#### 1.4.2. Suggestions For Site Facilities Improvements

Although all water points visited were functional, on-site observations and discussions were held with CTDA and AID personnel to determine what design changes could be made to improve site conditions. All design modifications suggested were minor and low cost (if any) for each structure. The suggestions are as follow:

Pump house - Improved floor drainage to a single point of discharge from the house,  
-- Provide wall shelving for off-floor storage of small items (tools, filters, rags, etc.),  
-- Refill holes around piping installed after pumphouse construction,  
-- Install name plates on pump houses indicating name, dedication date, etc. of facility,

People water point - The pedestal structure around the faucet walls should be raised to approximately 20 cm for a distance of at least 1.0 m away from the walls,  
-- Concrete aprons draining the pedestals should continue for approximately 2.0 m away from the pedestals.  
-- The distance between faucets should be increased to at least 1.5 m to reduce crowding and spillage during busy periods.  
-- The types of faucets being used should be reviewed to evaluate spigot size and type (for hose connections), and valve type (maintenance and control).

Stand pipes - Aprons beneath and surrounding the stand pipes should be sufficiently designed (structurally) and elevated to support five (5) cubic meter tractor drawn tanks. This would avoid apron depression and subsequent ponding of drained and spilled water.

Animal water points (troughs) - A simple pipe-bar design should be formulated to effectively divide the trough for drinking from two sides; to discourage animals from climbing (or falling) into the trough.  
-- The trough pedestal should be extended to at least 1.0 m around the trough and a concrete drainage apron extended 2.0 m beyond. This would facilitate both drainage and cleaning of the area proximate to the trough.

Reservoirs - Careful consideration should be given in sizing, design and placement of reservoirs. Larger and/or elevated reservoirs would allow more appropriately sized pumping units and simplify water point operations in most cases.  
-- In all cases possible, all water point facilities should be designed to float on an elevated (remote-ground or on-site) reservoir.

General water point drainage - All facilities on a site should be designed for single-point discharge of spilled and otherwise accumulated waste water.  
-- Designed concrete or half-pipe lined ditches should be constructed to collect facilities drainage and direct it down gradient and away from water point activities.  
-- It should be a function of the site custodian (pumpist) to maintain and control site drainage, either by himself or with beneficiary assistance.

The suggestions indicated above are related primarily to improving accessibility, safety and sanitary conditions in and around project water points.

#### 1.4.3 Maintenance and Reliability of Water Points

One of the most important factors related to the social aspects of the current project is that the water points provided have a high degree of reliability. In order to provide such reliability a promptly responsive and effective maintenance program must be operational. A two tier level of maintenance is recommended as follows:

1. First level on-site preventative and general maintenance. This maintenance would be conducted by the on-site pumpist and would consist of such items as:

- Pump house and water point inspection and cleaning,
- Maintaining clean fuel supplies to engines,
- Periodic oil changes,
- Lubrication of moving parts,
- Cleaning of filters,
- Maintaining radiators,
- Cleaning outside engine and pump surfaces,
- Repair of minor piping leaks, etc...

2. Second level minor through major mechanical repairs. This type of repair would be conducted through contact with the regional CTDA office and maintenance crews at the request of the pumpist-to-delegate-to-CTDA on a work order basis, and would include all maintenance, repairs, and replacements not assigned to the pumpist.

These two levels of activity would be applicable to both pumping systems and civil works.

Currently these two levels of maintenance are somewhat poorly defined and have a rather low order of organization. It is recommended that the maintenance program (which could eventually include more than 150 watering points) be upgraded with respect to both definition and organization by a technical assistance program consisting of Tunisian and/or USAID provided personnel.

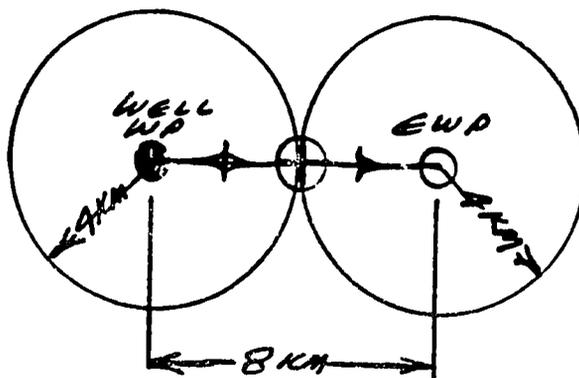
### 1.5 Water Point Extension Systems

Extension systems may be assumed to be of four types and have several common characteristics. Figure G-3 depicts the four types of extension systems proposed by CTDA. Brief descriptions of same are also presented.

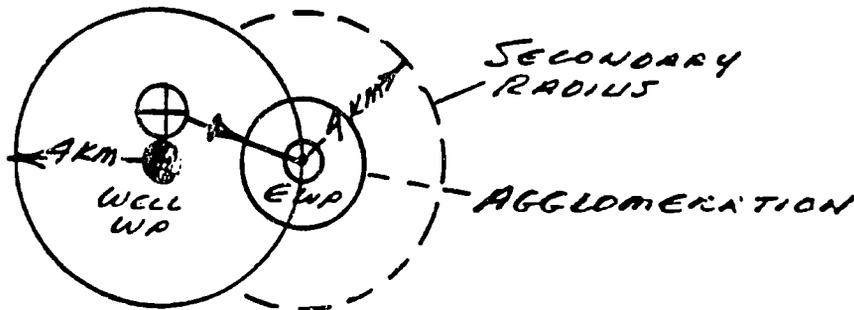
#### 1.5.1 Rural Extension Type

This type of extension is linear in nature and maximizes the concept of the four (4) km radius for rural potable water points. A single extension would increase the source (well) service area from approximately 50 to 100 Km<sup>2</sup>. Rural extensions of this type would be most appropriate in regions of flat terrain where well production is at least 5 l/s. More complicated system engineering and operation would be anticipated for this type extension than for the single well, four (4) kilometer radius water point type. Further, this type of extension would probably require significant civil works modifications at existing water points before extensions could be made. Technical, economic, operational, and reliability considerations suggest that the rural extension could be less feasible than constructing a new well eight (8) kilometers from the original well.

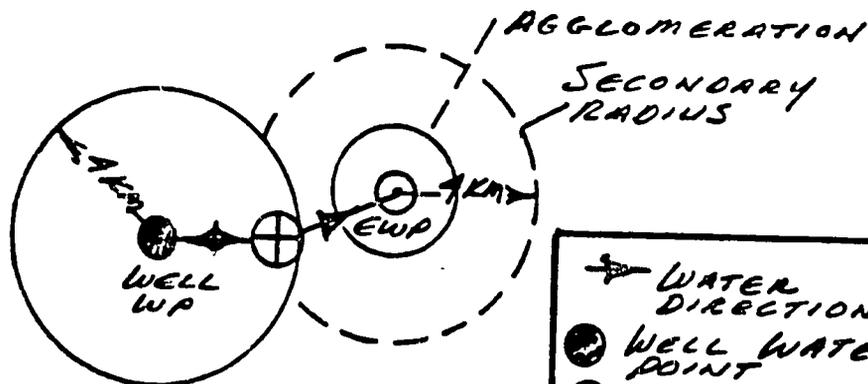
FIGURE G-3  
 TYPES OF WATER POINTS EXTENSIONS  
 TO BE CONSIDERED FOR 1986-1990 PROJECT



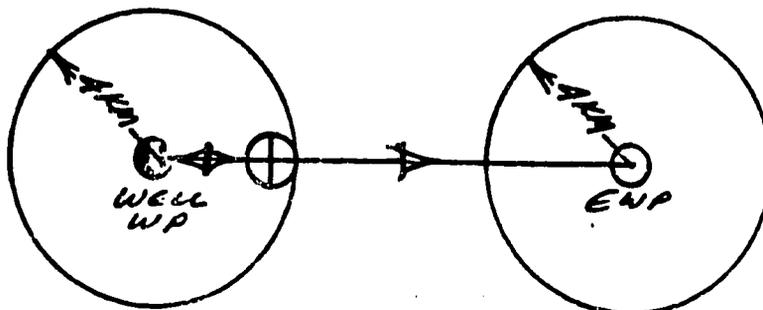
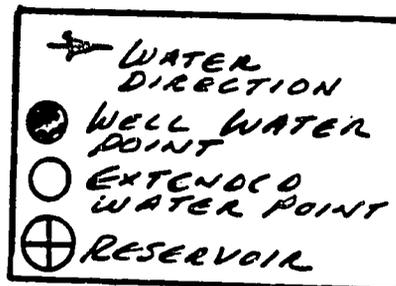
RURAL TYPE



FRINGE AGGLOMERATION TYPE



RURAL-AGGLOMERATION TYPE



EXTENDED EXTENSION TYPE

### 1.5.2 Fringe-Agglomeration Type

An extension of this type would be designed to include an agglomeration (village) at or near the fringe of a single well, four (4) kilometer radius water point. This results in a relatively dense population being included in a service area as well as including an additional portion of a secondary four (4) km radius of rural population. Considering the increased quantity and area of population served and the technical, economic and operational modifications required, the fringe-agglomerate system appears justifiably feasible.

### 1.5.3 Rural-Agglomeration Type

Because of system features, this type of extension can be operated essentially separately from a four (4) Km radius water system. The rural agglomeration extension reaches beyond the four (4) Km radius to include an agglomeration zone and secondary rural population within four kilometers outside a well source radius. This system requires an elevated reservoir from which both the well radius zone and the agglomeration zone can be served by gravity, i.e., both systems float on a single reservoir. Since both systems can be operated independently, the water points can be treated as separate entities. The rural agglomeration type system appears feasible from aspects of general reliability, operational, economic and technical aspects, where source wells produce 5 l/s.

### 1.5.4 Extended Extension Type

This type of system is similar to the rural agglomeration type and operates essentially the same, i.e., both the well site and the extended watering point float and derive their water supplies from a single elevated reservoir. The major difference is that the populations served are not directly adjacent and require a lengthy (more than 8 Km) pipeline between them. This type of system, however, does not appear to meet general project criteria.

Each type of extension described has varying design and construction aspects which will require site specific considerations before being selected for implementation. This also assumes that the social criteria for sites are suitable.

### 1.6 Individual House Connections (New Mexico Model)

Water systems in rural development programs require essentially the same design considerations as those in urban systems. Additionally, they are to some degree all site specific. A rural system design requires, at minimum, the following items of information:

121

- Area and zone configuration to be served, including elevations,
- Source location, quantities, and operational hydraulics of same,
- System configuration and philosophy of operation,
- Water demand,
- Type of distribution system (metered or free flow)
- Control and accounting of individual connections, water use, etc...

The items indicated above are basic design criteria which must be determined before specific site designs can be formulated. These technical considerations are much more complex than those associated with individual well or extension watering points and, therefore, should be investigated thoroughly before system designs are initiated. To date, (August 1985) general design criteria have not been adopted by CTDA for individual house connection systems, let alone any specific model site.

It is recommended that after a potential location is selected for individual house connections, using the so-called New Mexico Model (NMM), that a qualified water supply engineer or organization (preferably from Tunisia) be retained to assist CTDA in defining design criteria, producing facilities designs, preparing bid document specifications and providing on-going monitoring throughout the course of project construction.

### 1.7 Applied Research Activities

A portion of this project is to be directed toward improvement of technology through applied research. The intended areas of research are:

- o The construction of deep wells (to 200 m) in locations where subsurface hydrogeologic data are not available.
- o The use of alternate materials such as PVC, fiber glass or polyethylene casing and/or screens for water well construction.
- o The use of alternate materials (PVC, etc.) in the construction of water point delivery systems.
- o Miscellaneous research activities.

Throughout the course of this project these items have been explored and evaluated in the framework of overall project objectives. Of major consideration is the concern that Project applied research will not jeopardize the effectiveness of an otherwise suitable water supply point system. Therefore, a cautious approach to the introduction of new concepts and materials is a primary criterion of the recommendations presented in the following sections.

132

### 1.7.1 Deep Wells Exploration

One element in the improvement of rural water supplies in central Tunisia is the location and development of new or unknown ground water resources. Each test boring and water well constructed adds to the knowledge of the occurrence, movement and quality of such resources. Thus within the very nature of this project, an element of research will be conducted. Additionally, it is recommended that six (6) project well sites be selected as step-out exploratory wells. A step-out well is herein defined as a well drilled within an eight (8) kilometer radius of an existing production well, but where the geologic structural trend characteristics and extent of a producing aquifer are not known or understood. Such step-out wells should be attempted only in locations where other project water point criteria (social, institutional, etc.) can be satisfied. The selection of such exploration sites will require close coordination between DRES and the CTDA.

The air hammer unit purchased under the previous project for the Ingersoll-Rand, TH-60 Drilling rig should be expeditiously obtained from Tunisian Customs for use on project well construction. A second air hammer unit should be purchased in 1986 to complement the one currently delayed in customs. Additionally, a drill bit suite to reinforce available bit supplies should be obtained.

### 1.7.2 Well Casing Alternative Materials

A review of the proposed wells design, in-country capabilities, experience, and materials costs suggests that only one option for the use of alternate casing materials appears feasible, that being the use of 6 inch diameter, PVC casing and well screen. The casing would be used in the well riser sections and the screen in the screened sections of wells. The use of PVC casing is not recommended for well production sections for reasons of fragility, low abrasion resistance and cost.

It is recommended that the use of PVC vertical slotted well screen be attempted in four (4) project wells. Slot openings, areas and configurations of the PVC screen material should conform to currently used 6 inch diameter steel casing. It is further recommended that a representative of the selected screen supplier be retained to advise Tunisian crews in the handling

and placement of the PVC screens to be installed. The costs of the PVC screens should approximate that of similar steel well screens.

### 1.7.3 Pipelines Alternate Materials

Transmission and distribution pipelines currently used in Tunisia are fabricated primarily of asbestos cement (AC). On the basis of cost alone the use of alternate transmission piping would obviate the use of large diameter PVC, polyethylene, cast iron, etc, when compared to AC material. Some economies could, however, result in smaller diameter distribution piping if research is a partial justification.

It is therefore recommended that a portion of one (1) extension water point and one (1) individual house connection (NMM) system be devoted to the experimental use of PVC pipelines.

The extension system selected should be one where 150 mm diameter, 10 bar rated pipe is to be utilized. A section of the extension piping near the well source, in an easily accessible area, should be selected for PVC pipe installation. Because no specific piping lengths are known at this time, it is recommended that \$25,000 be allocated to purchase PVC pipe and fixtures for a test section of an extension point AC transmission line. By this method, installation, operation and applicability features of AC pipe versus PVC pipe could be compared in a common environment. Design of the test extension system should be handled by the A & E firm responsible for other facilities designs.

The NMM system selected for PVC pipe experimentation should be one where 100 mm diameter, 10 bar rated distribution piping is to be installed. A section of the distribution system should be selected for the installation of 100 mm diameter piping. Because no specific lengths of pipe runs are known at this time, it is recommended that \$25,000 be allocated to purchase PVC pipe and fixtures for an in-system test section. By using this procedure installation, operations and applicability features of AC pipe versus PVC pipe could be directly compared, as in the case of the extension system. The project A & E firm would be instrumental in design, monitoring, and evaluation of the PVC test installation.

For both the test extension water point and NMM system, supplier representatives would be expected to assist workers in learning PVC pipe installation methods and best construction practices.

#### 1.7.4 Miscellaneous Research

In Section 1.1.2 of this annex it is recommended that field conductivity bridges be used in the course of test-bores drilling to determine down hole water quality changes. This in itself is a useful research activity. After a number of water quality logs are obtained, it may be possible to define stratification of quality in regional aquifer zones.

It is therefore recommended that two field conductivity bridges be purchased for use with and at the sites where the TH-60 drill rig will be operating.

125

TABLE G-A

WELL PUMPING UNIT COSTS FOR  
17 PROJECT WELLS COMPLETED SEPT. 1982 - DEC. 1984  
(SOURCE USAID/TUNIS)

<u>Well Designation</u>	<u>Pumping Unit Cost (TD)</u>
Ali Mejnoun	4,900
Mechrek Chems	4,900
Henchir Bgar I	-0-
Henchir Bgar II	15,364
Rakhmet	7,490
Oum Fedgha	5,790
Skira El Bidha	12,000
Khmouda I	9,580
Khmouda II	13,854
Thmed	-0-
El Ghradek	9,400
El Gounna	28,800
Mzira	20,260
Afrane	8,886
Bir Chaabane	17,187
Lejred	4,900
Ras El Oued	-0-
Project Total Cost	TD <u>164,011</u>

TD 164,011 / 14 wells = TD 11715/well  
Say TD 1,200 per well

-0-/ No pump installed

126

TABLE G-B

WATER WELL CONSTRUCTION COSTS FOR  
17 PROJECT WELLS SEPT. 1982 - DEC. 1984

<u>Well Designation</u>	<u>Well Construction Cost</u> <u>(including "E" Log)</u>
Ali Mejnoun	30,507
Mechrek Chems	35,921
Henchir Bgar I	11,119 (a)
Henchir Bgar II	12,570
Rakhmet	53,007
Oum Fedgha	81,838
Skira El Bidha	73,710
Khmouda I	31,814
Khmouda II	33,619
Thmed	33,412 (a)
El Ghardek	29,085
El Gounna	31,252
Mzira	30,456
Afrane	31,314
Bir Chaabane	34,801
Lejred	20,617
Ras El Oued	17,445 (a)
Project Total Cost	TD <u>492,713</u>
Plus 17 Elect. Logs at 100 each =	TD <u>11,900</u>
Total	= TD <u>504,613</u>
Average Cost 17 wells = TD 505,613/17 wells = TD 29683/well	
	<u>Say TD 30,000/well</u>

(a)/ Non-completed well, dry or poor water quality

## 2. PROJECT COST ESTIMATES (TECHNICAL)

### 2.1 Project Well Water Points Cost Estimates

Well point cost estimates for this project are based upon actual recorded costs incurred for facilities constructed for the 17 (14 functional) well points completed between September 1982 and December 1984. These facilities costs are categorized as follows:

- Well construction costs,
- Civil works facilities costs,
- Pumping equipment costs.

### 2.2 CTRD Rural Potable Water Project Well Construction Costs

These costs include all costs related to the siting, test boring, electric logging, reaming, casing and testing of each well. All time, materials and equipment costs incurred are recorded and billed on invoices titled, "Ecompte de Forage ou Piézomètre", available at USAID/Tunis. Table G-B lists the costs for the 17 deep well construction efforts from September 1982 through December 1984. Included in this table are three (3) wells which were either found to be dry or produce water of unacceptable quality. The overall average cost per well effort, including electric logging, was approximately TD 30,000. For six (6) wells constructed during calendar year 1984 the average cost per well was TD 30,300 suggesting inflation costs were lower than predicted, well construction efficiency was improved, or the drilling data are otherwise skewed.

#### 2.1.2 Project Wells Cost Estimate 1986-1990

Thirty (30) new deep wells for potable water points are currently (Aug. 1985) planned to be drilled-constructed in the course of this project.

Eight (8) wells are planned for 1986 after location studies are completed. The initial four (4) of these wells are to be constructed using current location criteria, while four (4) are to be drilled under revised criteria which may be developed during the Water Resources Mapping study.

Twelve (12) wells are scheduled for 1987 and 10 for 1988. The remainder of the project (through 1990) will be reserved for additional possible wells, completion of civil works at watering points, and water point extensions (as appropriate).

Using a baseline average cost per well of TD 30,300, starting in 1985, the 30 well construction schedule, and a 12% compounded annual rate of inflation, the cost for project wells is estimated as follows:

<u>Year</u>	<u>Cost/Well</u>	<u>No. Wells</u>	<u>Project Well Cost</u>
1984	30,300	NA	NA
1985	34,000	-0-	-0-
1986	38,000	8	304,000
1987	42,600	12	511,200
1988	48,000	10	480,000
1989	54,000	-0-	-0-
1990	60,000	-0-	<u>-0-</u>

Estimate 30 currently planned wells

= TD 1,295,200  
SAY TD 1,3 millions

129

## 2.2 Well Points Civil Works Facilities

For estimates of construction quantities, types and costs presented herein it is assumed that former project criteria will prevail until approximately July 1, 1986. Therefore, previous project results were used for the most part in formulating manpower, time durations and costs for this project. It is further assumed that criteria changes, if any, will be in place after July 1, 1986 and a reevaluation of the estimates presented will be required at that time.

### 2.2.1 Civil Works Facilities Costs

As with the wells, construction costs for civil works varied greatly in the previous project. This variation was caused generally by:

- Site specific conditions (terrain, etc..),
- Sizes of reservoirs constructed,
- Sizes of pump houses constructed,
- Lengths and diameters of pipe required to join facilities.

Facilities for civil works costs at water points include:

- Site grading,
- Pump houses,
- Reservoirs,
- People watering points,
- Animal watering troughs,
- Stand pipes (for filling mobil tanks),
- Connective piping, valves, fittings, etc., for joining system facilities.

Table G-C lists the total costs for the former sites, however, facilities were not initiated at three (3) sites (dry well or poor water quality) and at the time of this analysis, data for one (1) site was not available. As a result, 13 of the 17 sites were used for costing purposes. Because of the variety of variable factors intrinsic to the civil works facilities, no attempt was made to evaluate inflation related costs during the previous project.

Quantities and costs are recorded on "Décompte Provisoire" as construction progresses. These documents are prepared and filed in the CTDA offices in Kasserine.

### 2.2.2 Project Civil Works Cost Estimate 1986-1990 (for proposed well points only)

Essentially all civil works facilities will be constructed utilizing Tunisian labor and locally fabricated materials. The

project-adopted rate of inflation of 12% per year is used in the cost estimates presented. The average cost per water point civil works facilities was calculated on bases of the former project to be TD 27,000.

The estimated cost for civil works facilities at the 30 well points proposed is as follows:

<u>Year</u>	<u>Cost per facility (TD)</u>	<u>No. facilities to be constructed</u>	<u>Total Cost (TD)</u>
1986	30,240	3	90,720
1987	33,870	6	203,220
1988	37,930	7	265,510
1989	42,480	7	291,360
1990	47,580	7	333,060
	<u>TOTALS</u>	<u>30</u>	<u>1,189,870</u>
		Rounded to TD	<u>1,200,000</u>

TABLE G-C

CIVIL WORKS CONSTRUCTION COSTS FOR  
17 PROJECT WELLS WATER POINTS SEPT. 1982 - DEC. 1984  
(SOURCE USAID/TUNIS)

<u>Well Point Designation</u>	<u>Civil Works Unit Cost (TD)</u>
Ali Mejnoun	7,976
Mechrek Chems	9,807
Henchir Bgar I	(1,451) (a)
Henchir Bgar II	- (b)
Rakhmet	44,365
Oum Fedgha	30,580
Skira El Bidha	22,741
Khmouda I	30,001
Khmouda II	6,848
Thmed	(4,035) (a)
El Ghardek	41,725
El Gounna	46,483
Mzira	16,685
Afrane	45,262
Bir Chaabane	16,976
Lejred	29,383
Ras El Oued	( -0- ) (a)
13 sites civil works TOTAL	= TD <u>492,713</u>
	SAY = TD <u>349,000</u>

TD 349,000 / 13 sites = TD 26,846 / Site average  
SAY TD 27,000 / Site average

( -0- )/ Not included in calculation  
(a)/ Dry or unacceptable water quality  
(b)/ Data not available

TABLE G-D

CONSTRUCTION TIME SCHEDULE FOR  
17 PROJECT WELLS, SEPT. 1982 - DEC. 1984  
(SOURCE USAID/TUNIS)

<u>Well Designation</u>	<u>Construction Duration</u>	<u>Days Duration</u>
Ali Mejnoun	09/04/82 - 10/24/82	32
Mechrek Chems	12/22/82 - 03/11/83	29
Henchir Bgar I	05/21/83 - 06/20/83	30
Henchir Bgar II	07/21/83 - 11/21/83	120
Rakhmet	12/24/82 - 02/28/83	62
Oum Fedgha	09/15/82 - 01/20/83	125
Skira El Bidha	02/01/83 - 03/18/83	46
Khmouda I	05/18/83 - 08/29/83	101
Khmouda II	09/02/83 - 10/24/83	44
Thmed	04/28/83 - 06/06/83	38
El Ghardek	07/28/84 - 08/30/84	32
El Gounna	02/29/84 - 05/04/84	65
Mzira	03/26/84 - 05/06/84	40
Afrane	10/27/83 - 03/04/84	127
Bir Chaabane	11/25/83 - 02/24/84	89
Lejred	09/18/84 - 12/25/84	91
Ras El Oued	10/26/82 - 12/20/82	54
		<u>1181 Rig Days</u>

1181 Rigs Days / 30 Days = 39.4 Rig Months  
39.4 Rig Months / 17 Wells = 2.3 Rig Months / Well

132

### 2.3 Project Water Point Extensions

Four extensions are proposed for the project. As indicated in Section 1.5, four types of water point extensions have been identified, three (3) of which appear to meet current criteria and one that probably does not. Since no specific extension types or locations are yet decided, it is assumed that the extensions will consist of the following types and quantities:

- One (1) rural,
- Two (2) fringe-agglomerations,
- One (1) rural-agglomeration,

It is further assumed that all extensions will originate from an existing well water point and reservoir system, or one to be constructed under the 1986-1990 project. Thus, facilities for all extended water points will consist of:

- A pipeline connection to an existing reservoir,
- A people water point,
- A stand pipe (tank filler),
- An animal water trough,
- Connecting piping and fittings for on-site facilities.

#### 2.3.1 Water Point Design Criteria

Since extension locations have not yet been selected, no site specific conditions are known. It can only be assumed that low hydraulic head systems will be employed which will require careful engineering analysis and design before implementation. The most serious conditions to be considered are reservoir elevation, connector pipeline length and pipeline diameter. Pipeline costs will constitute the major expenditure for any well point extension.

Although pipeline design criteria for site-specific conditions cannot be defined at this time, it is probable that the 10-bar pressure rating of asbestos-cement (AC) pipe used almost universally in Central Tunisia is a hydraulically limiting factor.

Design criteria for all other extended water point facilities are assumed to be similar to those of an individual well water point (exclusive of the pump house).

#### 2.3.2 Project Extensions Cost Estimate

Currently (Aug. 1985) the distances of proposed extensions from well water points are not known, however, for budget purposes the following estimates are proposed:

134

<u>Type</u>	<u>Pipeline Dia. (mm)</u>	<u>Pipeline length (Km)</u>
Rural	250	8
Fringe Agglomeration	200	4
Fringe Agglomeration	200	3
Rural Agglomeration	200	3

Estimated cost (1985) per installed linear Km of AC pipe in (including fittings) Central Tunisia (Source CTDA) are as follows:

<u>Diameter (mm)</u>	<u>Cost / Km (TD)</u>	<u>Pres. Rating</u>
100	15,000	10 Bar
150	20,000	10 Bar
200	25,000	10 Bar
250	35,000	10 Bar

Costs (1985) for civil works facilities for an average extended water point system would be as follow (from CTDA files):

-- People water point	= TD 1,000
-- Stand pipe	= TD 1,500
-- Animal water point	= TD 0,800
-- Connective piping	= TD 0,500
Total	= <u>TD 3,800</u>
Say	<u>TD 4,000</u>

Thus the estimated cost for construction of the four (4) extensions proposed is as follows:

<u>Type extension</u>	<u>Pipeline cost (TD)</u>	<u>Civil Works Cost (TD)</u>	<u>Total Cost (TD)</u>
Rural (8 Km)	280,000	4,000	284,000
Fringe Aggl. (4 Km)	100,000	4,000	104,000
Fringe Aggl. (3 Km)	75,000	4,000	79,000
Rural Aggl. (3 Km)	75,000	4,000	79,000
Total 4 extensions			= TD <u>546,000</u>
			Say <u>TD 550,000</u>

It is assumed that the four extensions will be designed and constructed throughout the project period of 1987 through 1990. Using the following construction schedule and the project adopted inflation rate of 12 percent, the following cost for water point extensions is calculated.

<u>Year</u>	<u>Extension Type</u>	<u>Extension length (Km)</u>	<u>Cost (TD)</u>
1986	--	--	--
1987	Rural Aggl.	3	99,100
1988	Rural	8	335,600
1989	Fringe Aggl.	4	163,600
1990	Fringe Aggl.	3	139,200
	Total four extensions		TD 737,500
			Say TD 738,000

Project cost for the four (4) extension water points proposed and scheduled is estimated to be TD 738,000.

#### 2.4 Project Individual House Connection (NMM) Models

Within the scope of the project two villages (agglomerations) are proposed for individual house connections using the New Mexico Model.

##### 2.4.1 NMM Design Assumptions

Again, as in the cases of project wells and water point extensions, the sitings of the NMM have not been made and basic design criteria are not formulated. Thus, in order to estimate costs, assumptions must be made. These are:

- The NMM will be located within a four (4) kilometer radius of an existing well-point and/or reservoir system,
- The NMM will consist of approximately 50 dwellings concentrated within a 1/2 kilometer radius and have a generally square or rectangular configuration,
- The NMM water system will be of low hydraulic head and, as such, be unmetered,
- The NMM system will float on an elevated reservoir, i.e., no booster pumping will be required,
- The method of water delivery control through each service connection will be by the use of small diameter (1.0 cm approx.) piping under relatively low pressure,
- Transmission system pipeline from the existing reservoir will be four (4) Km long and be approximately 200 mm diameter,
- In-village piping will consist of 100 mm diameter AC pipe hydraulically looped to equalize system pressure.

##### 2.4.2 Project NMM Cost Estimates

Construction components and costs (1985) thereof for a system such as that described above would be as follows:

- Four (4) Km of 200 mm diameter extension pipe in place = TD 100,000,
- Two (2) Km of 100 mm diameter distribution mains = TD 300,000,
- 50 house connections to above ground taps at house fronts (or backs) = TD 300 each = TD 15,000
- Total construction cost per NMM would be approximately TD 145,000
- Say TD 150,000

Construction schedule estimates indicate completion of one (1) NMM system in 1988 and one (1) in 1989. Using the adopted inflation factor of 12% per year, total project cost for the two (2) NMM is estimated as follows:

<u>Year</u>	<u>No. of NMM</u>	<u>Cost per NMM (TD)</u>	<u>Total Cost (TD)</u>
1986	-0-	168,000	-0-
1987	-0-	188,200	-0-
1988	1	210,800	210,800
1989	1	236,100	236,100
1990	-0-	N/A	-0-
<b>TOTALS</b>	<u>2</u>	<u>803,100</u>	<u>446,900</u>
		<b>SAY</b> <u>TD 450,000</u>	

Project cost for two (2) individual house connection (NMM) models is estimated to be TD 450,000.

### 2.5 Pumping Unit Cost Estimate

Actual pumping unit costs can be determined only after each well is drilled and outfitted. However, based upon pumping unit costs in the previous project (see Table G-A), the following cost for 30 additional units is calculated using a five (5) percent per year inflation rate. It is further assumed that the purchase schedule for the 30 pumping units will be as follows:

<u>Year</u>	<u>Average Cost/Unit</u>	<u>No. of Units</u>	<u>TD Total Cost Amount</u>
1985	11,800	-0-	-0-
1986	12,400	6	74,400
1987	13,000	12	156,000
1988	13,700	8	109,600
1989	14,400	4	57,600
1990	NA	0	-0-
		<b>30 Pump Unit Cost Total = TD</b>	<u>397,600</u>
		<b>SAY TD</b>	<u>398,000</u>

It should be noted that in this estimate a five (5) percent inflation rate is used because pumping units will probably be purchased from an out-of-country source, with a lower inflation rate than predicted for Tunisia.

## 2.6 Equipment and Research Cost Estimate for Proposed Project

Equipment and research costs for the project somewhat overlap in the technical sense, therefore they are brought together under this one heading.

Technical equipment to be purchased for Project support:

1 ea. Van-mounted electric logger	=	\$110,000
2 ea. Field water-quality conductivity bridges	=	\$ 1,200
1 ea. Down-hole air hammer unit for I.R. Rig	=	\$ 10,000
1 ea. Bit Suite for air hammer unit (4 bits)	=	<u>\$ 10,000</u>

Sub Total US\$ 131,200  
SAY \$131,000

Materials to be purchased for field research and testing:

--150 mm diameter, 10 bar rated, PVC pipe and fixtures for water point extension system evaluation, lump sum Tech. Assistance included	\$25,000
--100 mm diameter, 10 bar rated, PVC pipe and fixtures for in-system NMM evaluation, lump sum Tech. Assistance included	<u>\$25,000</u>

Sub Total \$50,000

Total equipment and research cost \$181,000

128

ANNEX H

SOCIAL ANALYSIS

1. OVERVIEW

This project is proposing to create additional water points, either through the creation of new wells or through the extension of existing water points to new areas. It also includes an experiment with house connections for areas with scattered populations. From an institutional point of view, the project includes a major innovation in the creation of Water User Associations to manage the new and old water points in Kasserine Governorate; these Water User Associations will be coordinated by a liaison office in the CTDA to be called "Bureau/Unité de l'Autogestion des Points d'Eau". Since so much of the project involves innovative patterns of social organization, the social analysis is a thorough treatment of all the social issues involved.

First we look at the general nature of the beneficiary population, its way of life, water use patterns, size, and distance from existing water points. One key question here is to evaluate the probable effect of the planned interventions on different categories of the population. Another key issue is the various health problems involved in gaining access to, and using, potable water, in the Central Tunisia area.

The second half of this analysis deals with the issue of the Water User Associations and their prospective ability to generate the funds needed to cover the running costs of the new and existing water points. There is adequate experience in Central Tunisia to begin to formulate a judgment on this question. By and large this experience shows that there is sufficient organizational capacity in the area, and that the people of the area are ready and able to pay the sums of money required.

2. BENEFICIARY POPULATION AND WATER USE

2.1 Population and Settlement Pattern

The beneficiaries of the potable water project are mostly those engaged in dryland farming and in animal husbandry, primarily sheep raising. Those who live on the irrigated perimeters or who have their own shallow wells for irrigation purposes probably also get their drinking water from this source one way or the other and so are not the subject of our interest here. Even more particularly, those who would benefit from the USAID

Project are in the poorer 80% of the dryland farmers and shepherders, those who are essentially subsistence level farmers -- though by and large, a market orientation and a degree of absorption into the market are far more advanced now than they were in 1978, at the beginning of USAID's involvement in the CTRD area.

These dryland farmers basically live from a combination of cultivation of cereal crops and raising sheep, in different proportions according to region. In those northern parts of the area where rainfall is the primary source of water, the emphasis is on cereal crops and there are relatively few animals because of the difficulty of providing them with sufficient water. In the southern parts of the area, animal husbandry is the dominant form of economic activity, and the scant rainfall means that agriculture is only possible in a few favored spots.

The basic population of the area is largely descended from the pastoral tribes which migrated through the area at the beginning of the century. The two major ones are the Freshish on the western part of the zone, and the Majer in the east. When these tribes settled, each family settled on land to which it could lay claim (though rarely with a formal land title). Even nowadays, people prefer to live on land that they own (it costs nothing and is near the family's economic resources). For this reason, the settlement pattern is generally one of scattered houses. Usually these houses are clustered in a very loose sense, meaning that they are perhaps 100 meters apart. A cluster of such houses is a "douar"; a group of clusters is a "arsh", or subtribe. Very frequently, the houses are lined up along the bottom of a ridge where it flattens out into a plain, perhaps to allow for improved drainage. This history accounts both for the scattered settlement pattern and for the fact that many houses are located at some distance from the nearest convenient water point.

The traditional water points in the area were the springs and some hand-dug wells allegedly dating back to Roman days. Additional water was collected in cisterns designed to store rain runoff. However, in the traditional herding economy, a substantial proportion of the population would migrate to the north during the driest time of year. Thus for most people the task of hauling water is an ancient one, but sedentarization has accentuated the problem.

## 2.2 Access to Water

Domestic uses of water include drinking and cooking, washing clothes and dishes, bathing and washing of people, watering livestock, watering young trees (when they grow they can survive on rainfall), washing wool, etc. For some of these uses, people

may go to the water point instead of hauling water home or otherwise vary their water sources. For instance, women may wash their clothes in an irrigation ditch but rely on a spring for drinking water. If the home is not too far from a water point, including specifically a wadi, then the herd of animals may be taken there to drink while being grazed. In order to calculate the figures for water use per capita or per household, all these various factors have to be taken into consideration. A family that hauls water to wash clothes or to water sheep may appear to have a much higher per capita consumption than one that manages to do these activities outside the home. Specific kinds of water are recognized, and each may be used for a distinct purpose.

Nowadays people in these areas have several ways of acquiring and using water. The following comments relate to those who use a public water point. Generally, men and children of both sexes seem to be the most frequent haulers of water. Women are relatively uncommon, though they may use the water point to wash clothes or wool.

(1) A person can take a donkey to a nearby spring or well; this donkey will have a pair of containers slung across its back. Typically each container holds 20 liters, and the pair 40, though larger containers are sometimes seen. Families that haul water in this way may make several trips daily to the water points.

(2) A family can use a 500 liter mobile tank designed to be pulled by a donkey.

(3) A tractor-drawn mobile tank of 1000-3000 liters can be used. In this case, and sometimes in the preceding case, the water is poured into a cistern dug into the ground near the house and kept until used. (This kind of cistern should be distinguished from the older kind used to capture and store rain water). In the case of the tractor-drawn tank, most often it is a matter of a resident buying the contents from the tractor operator. In other words, the water is "sold".

(4) In a few cases, where families live close enough to the water point, people may hand carry the water.

### 2.3 Water Use Patterns

People probably use around 20 liters per person day for true domestic purposes -- that is, drinking, cooking, and washing. People who can haul home more water than that, or who are hiring tractor-drawn tanks fairly frequently, are probably continuing to use about the norm for themselves, and are using the balance of the water to support such economic activities as starting a home garden

or orchard, or watering livestock. In other words, once people reach a certain threshold of water availability, they are more likely to devote extra water to income-generating purposes than to augmented household and personal use. Perhaps the gradually increasing norms for cleanliness will cause an increase in the true domestic use of water, or perhaps health and hygiene education will push them in that direction.

At the moment extra water is likely to be used for income-generating purposes. The water is used to support home gardens and the growth of young trees, and of additional flocks of sheep and goats. These are market oriented activities, and produce a lot of the cash income that people have. In 1978, Hopkins noted that the most prosperous parts of the area were those parts that had shallow wells or irrigated farming. What is now happening is that the increased availability of water is allowing even dry land farmers to be more involved in fruit production. (So far there is relatively little vegetable production). Thus in this way they are participating in the generally increased level of prosperity in the region. The new wells are likely to be multipurpose wells, and each one is a potential small-scale development pole.

There is still a long way to go. It is still possible to find people 5 to 10 km from the nearest usable potable water point, especially in summer. The shortage of water means that a substantial number of working hours per household are spent in fetching water, or that scarce cash is spent paying the tractor operator. Throughout the area the relative scarcity of water means that people economize a great deal on personal uses of water, to the detriment of their general level of health.

#### 2.4 Effect of the Planned Interventions on Different Categories of People

The interventions proposed for this project will enter into the field described above. They are likely to have differential effects on the different categories of people involved. Some of the categories and their likely effects are outlined below.

(1) On households now hauling their own water -- (a) less time spent in hauling water; (b) necessity to spend some cash, and perhaps to contribute with labor; (c) involvement in the community-building efforts of the WUA.

(2) On households now "buying" water -- (a) if they continue to buy water, perhaps at a lower cost; (b) if they switch to the use of family labor to fetch water, then definitely a lower money cost, but a higher investment of time; (c) involvement in the community-building efforts of the WUA.

11/2

(3) On "sellers" of water -- perhaps a change in water points, so they haul a shorter distance, which could mean more trips per day so that total income might in theory remain stable; they could also continue to haul water from their current water point if the new one does not offer a standpipe to facilitate loading; if they are hauling water for livestock or for irrigation, then the amount is not likely to diminish. If they are hauling water for people's domestic uses, and those people switch to the new water point, then there may be fewer customers. However, it is doubtful that owners of tractors and tanks will be without alternative ways of making use of their investment. In any case, this is a minority situation.

(4) On pump operators -- In the first place, there will be more pump operators. Pump operators will have a more complex job as they may be required to collect money or to police the users to make sure that all are entitled. This may be a role they find uncomfortable. Some pump operators do not appear to welcome the water user association, the only category of respondents which does not. On the other hand, WUAs might decide to treat their pump operators better than the government does; this is hypothetical.

(5) On women -- In the CTDA project area at the moment, women are not particularly evident as haulers of water. This could be in some cases the result of the long distance between the water point and the homes from which they may not be able to be long absent. With the water point closer to the home, the pattern of water hauling may change. Women may more frequently haul water themselves, since the water point is closer and consequently it would, in the traditional view, be safer for a woman to go there. Where women are water haulers, there is a likelihood that the time spent hauling water will be reduced, thus freeing time which can be devoted to other tasks, some of which might be income generating. The increased amount of water which can become available will enable women to carry out their traditional tasks of cooking and washing more easily, and allow them to give better hygiene care to their smaller children. Proximity of the water point may facilitate washing of clothes there, thus reducing the amount of water that needs to be hauled and, possibly, leading to increased frequency of washing.

To the extent that women are, in effect, single heads of house (due to the death of the husband, or his absence to work in the cities, or abroad), they will be affected as are male heads -- as concerns provisioning their families with water, paying cash for water, and providing labor as required for the new water point.

(6) On children -- In a general way, the reduced time needed to fetch water may make it easier for children to attend school, or to pay sufficient attention to their studies to have a better chance of success. However, the chore of hauling water will not disappear, only be reduced in scope.

(7) On "citizens" in general -- The creation of water user associations amounts to a kind of empowerment. Men, women and children in these rural areas will (for the first time in recent Tunisian history) have been given the responsibility for managing a key natural resource, and in doing so will have created a new institution that may well acquire other functions in local government and community development.

### 3. SIZE OF BENEFICIARY POPULATION

#### 3.1 The 1984 Census

The size of the beneficiary population can best be judged from the census conducted by the government of Tunisia in 1984. The population of Tunisia grew from 5.5 to 6.7 million inhabitants between 1975 and 1984, an overall increase of 24.7% during this period. The comparable figures for Kasserine Governorate are 238,499 in 1975, and 297,959 in 1984, an overall increase of 24.9%. The relative proportion of Kasserine within the total national population has remained stable. In the meantime, the three delegations with Siliana Governorate (Kesra, Makthar, and Rohia) that are included in the Central Tunisia area had a population increase of only 21.6%, thus suffering a relative depopulation.

In Kasserine governorate, the urban population is 89,050, and the rural population is 208,909. (Urban population is that living in areas with a municipal form of government; at the time of the 1984 census that meant, in decreasing order of size, Kasserine city, Feriana, Sbeitla, Thala, and Sbiba). The "agglomerated rural" population in Kasserine governorate is 12.6% (compared to 50.2% in South Siliana); this is an index of the extreme dispersion of the rural population. The overall density of the governorate is 36 persons per sq km. Both the percentage of clustered population and the density vary across the governorate. In addition to the 5 towns with municipalities, there were 14 places referred to as "main agglomerations". The average household size in Kasserine governorate is 5.6 persons, compared with 5.4 in Tunisia as a whole. (It should be noted that it is probable that the census takers considered each married couple as the basis of a new household, regardless of residential and sharing patterns). Thus the official figure is lower than that recorded in household surveys.

#### 3.2 Perceived Distance from the Nearest Public Water Point

The census takers asked the households several questions concerning their access to water. The following figures relate to the 36,920 households in the rural sectors of Kasserine

governorate. Of this number, 3.7% said they were hooked up to the SONEDE network, presumably those on the edge of towns with SONEDE service. Another 25.7% said they got their drinking water from a cistern or a private well. Here the census categories leave something to be desired, since some cisterns rely on rainfall (probably those meant by the census) while others are filled from a public water point. In addition to these two categories, the remainder of the population (70.6%) said they got their water from a public water point. Public water points were broken down into cisterns and public taps on one hand, and springs on the other. People who get their water from the public water point were then asked whether this point were nearby, rather far, or very far. In the governorate as a whole, 45.7% of those getting their water from a public water point described this point as "very far", while 30% found that the point was rather far, and 24.3% thought that it was near. Allowing for all the vagueness in the presentation of these census results, we can probably consider that there are around 12,000 households (those who feel that they are "very far") who would be the primary beneficiaries of the USAID project in Kasserine governorate. This represents about 70,000 people. These figures are commensurate with the figure of 87% of the rural population which lives in isolated farmsteads. There are perhaps another 44,000 in North Gafsa and Sened Delegations who lack access, approximately 30,000 of whom would be considered "very far". The total potential beneficiary population of the most thirsty in Kasserine, North Gafsa and Sened is thus around 100,000 people. (This calculation assumes SONEDE, Genie Rural and/or PDR will be taking care of the more clustered populations during the project period). Under the proposed project approximately 50,000 people are expected to be served. The remaining 50,000 are presumed to be in extremely dispersed locations. The results of the Water Resources Mapping Survey will provide more data about the needs of this group and the appropriateness of extending existing systems for their future service.

The breakdown of percentages of those who considered themselves "very far" from a public water point by delegation reveals a fairly standard rate. The lowest figure was in Thala, where 31.1% of public water point users defined themselves as very far. The highest estimate was from Feriana, where 66.4% of the rural people so defined themselves. In other words, from one third to two thirds of each delegation's public water point users defined themselves as "very far" from a public water point. Other delegations in which more than half the public water point users fell into the "very far" category were Sbeitla (50.2%), Sbiba (51.6%), and Jedliane (54.5%).

145

#### 4. HEALTH ISSUES

One of the main purposes behind the potable water project is to ensure clean drinking water for the rural people of Kasserine. Thus the incidence and epidemiology of disease are important features to consider. This project assumes that water from a drilled well is going to be clean at the beginning. However, this does not insure its cleanliness once it is drawn.

The first problem is the cleanliness of the water point site itself. Each site has two features that contribute to an unclean site -- there is extra water that falls to the ground in the process of filling the containers, or because the water is used to wash out containers, or for other reasons; and there is animal excrement, in particular from donkeys used to transport water. Human behavior around the site can diminish the risk from these two sources, and engineering can perhaps also reduce the danger, particularly through improved drainage of excess water. However, people are not always aware of the dangers and of the behavior necessary to avoid them, nor are they always sufficiently motivated to act on their knowledge. Thus a public health education program around each water point is indicated. Emphasis on these issues in the local schools is also important because the children are such frequent water carriers. It is important that water users should take care to handle extra water and animal excrement carefully, because neither can be eliminated totally. They can be kept further from the spigot, but not eliminated.

The second source of contamination in clean water is the use of dirty containers either to carry water home or for storage at home. Here again a public health education program, both in schools and directed at the water users, is essential. In this respect it is important to remember that even where the carriers are men and young people, the actual users of the water in the home are likely to be women. If the women are not present at the water point, then they must be contacted, household by household, at home. Here is where the water user associations, in conjunction with the local health and social affairs workers, can do a fine job. One possible solution is to encourage the home use of "Javel", potassium chloride water.

It should be presumed that improved availability of potable water will reduce the incidence of intestinal, skin and eye diseases, the water-borne diseases. This is however notoriously hard to measure because of all the other factors that could influence morbidity.

It is possible that medical and health education programs would be improved if officials knew more of the actual behavior with regard to water. There would be some room for an ethnographic study of habits and beliefs relating to water use in the Central Tunisia area.

## 5. SOCIAL CONTEXT OF WATER USER ASSOCIATIONS IN KASSERINE

This project paper is proposing the creation and encouragement of water user associations in the Central Tunisia area, notably in Kasserine Governorate with pilot efforts in the Gafsa delegations of North Gafsa and Sened contemplated in later years. These Water User Associations will have several tasks, notably the autonomous management of the water points, the maintenance of the water point in a healthy condition, the diffusion of notions of health and sanitation, and the organization of water use patterns around the water point. The basic function is the first one, which requires people not only to work together but also to collect and spend money in order to cover the running costs of the water point. These associations will presumably have a managing committee of some kind, led by a few officers.

This is an institutional innovation in the area. It is indeed a pilot project for all of Tunisia and thus carries an importance that reaches beyond the immediate area. It is appropriate to inquire what the chances of success are.

### 5.1 Contemporary Developments

Several processes are now underway in the Central Tunisia area, which suggest that the Water User Associations have a good chance of taking root. On the one hand, the Tunisian consultant hired by the CTDA as a result of the recommendations made in the 1983 evaluation of the first potable water project has been very active in the last 18 months, and has been successful in setting up a structure at the governorate and delegation levels which involves the participation of a large number of government officials in the process of developing and caring for potable water points. The consultant has encouraged the creation of a Regional Potable Water Committee corresponding to the Governorate of Kasserine, and of Local Potable Water Committees in each delegation, as well as of some 150 water point oriented Water User Associations.

The Regional Potable Water Committee includes representatives of the CTDA, both from the central office and from the branch offices located in the delegations. It also includes representatives of the other services involved, notably health,

social affairs, the Rural Engineering service and the Water and Soil Resources Division of the Governorate-level agricultural office, the Rural Development Program run from the governor's office, etc. The Local Potable Water Committees in each delegation include the representatives of the CTDA, a health worker and a social worker. The Regional Potable Water Committee has above all a policy-making role in the creation and management of water points in the governorate, while the Local Potable Water Committee has above all a role of visiting potable water points in order to contact the population, and encourage them to take certain actions, such as cleaning up the site.

The committees themselves have not yet tackled the issue of paying for the running costs of the water points. However, in some areas, people around a water point have more or less spontaneously begun a process of collecting money for this purpose. In Sbeitla delegation, the delegate has set the rates for large and small tanks, the others being free. In other water points in Thala or Majel Bel Abbes delegations, the decision seems rather to have been made at the local level. In some cases, the money for the water point is being collected through the local branch of the Destourian Socialist Party (to all intents and purposes, especially in these rural areas, still the single party). The system has not yet become generalized but it seems to be fairly well accepted by the water users in these areas.

One of the problems that has emerged, due to the lack of a legal basis for collecting money since the associations themselves at this point can have no legal existence, is how to collect the money. In Sbeitla, the delegate has simply instructed the pump operators to charge money, and has given them a booklet of receipts to keep track of their income. They are also supposed to spend the money on fuel, and keep the receipts until an official accountant can check them out. In other areas, the local party branch has taken on this task. In some other areas, it may be a private citizen, although this solution is regarded with some suspicion in official circles.

In areas where money is being collected, there is a sliding scale. Details vary, but pretty generally three categories are recognized: tractor-drawn tanks of around 3000 liters, animal-drawn tanks of around 500 liters, and other smaller users. In Sbeitla for the moment only the first two categories are being charged, at a rate of 170 mm per cubic meter for the large tanks and 200 per cubic meter for the small tanks. Scattered information from other sites suggests that much the same pattern is being followed. In sites where small users are paying money, it is generally a fixed fee per month (500 and 1700 millimes (mm) have both been reported); this would almost certainly produce a much lower rate per cubic meter.

Another type of payment is practiced at some water points. In this system, the big tanks alone pay, and they must provide fuel to replace the fuel needed to pump their water, generally around 2 liters for a 3000 liter tank. This represents a cash value of 400 to 500 mm, and so is comparable to the 500 mm charged for this service in the officially-run Sbeitla systems.

Thus there are several local level experiments with the notion of paying for water costs at the public water points. These experiments are a critical and valid starting point for developing a system that would be acceptable both to the people and to the government.

The systems as developed so far, however, focus entirely on the issue of collecting enough money to cover the running costs of the water point. They generally have the advantage of charging big users more than small users (although some of the water transported in the big tanks is resold to small users at a considerable distance from the water point). However, they have not yet acquired sufficient structure as associations to undertake other tasks. Thus the task that remains to be done is to elicit this structure and encourage it to look beyond financial matters alone. This step is both necessary and unavoidable if these associations are to survive. If they are only a substitute for taxation, there will eventually be resentment and cheating. The task is to transform these various ad hoc methods for collecting and spending money (or goods) into associations with a broader range.

## 5.2 Parallel Experiences

There are some examples in the local environment which suggest that the water user association pattern is workable. There are some 30 agriculture cooperatives recently formed in Kasserine governorate. These are mostly small groups of farmers who have banded together to purchase and manage equipment in common. This solution is being actively encouraged by Ministry of Agriculture officials in Kasserine, and seems acceptable to local farmers.

The Community Development Foundation (SCF) has so far been working in two localities in the Central Tunisia area, and their results show what it is possible to accomplish. In one area (Magrouna, Rohia delegation of Siliana governorate), 23 farmers have banded together to form an association to pump irrigation water from the nearby river to their gardens and orchards. This association was formed in the presence of local officials who serve as its guarantee, and it allows them to receive certain financial advantages from the government.

These farmers are used to taxing themselves for projects of common interest. Currently they are involved in creating a potable water system, financed by collecting money from themselves as well as by contributions from the SCF/CDF and the CTDA. For the irrigation system, they maintain a small kitty of TD25 to cover minor maintenance costs, and expect to collect per capita shares if there are larger repair expenses. Fuel costs are covered according to the principle whereby each user replaces the fuel he uses. Among other things this means that only small amounts of fuel have to be transported the considerable distance into Magrouna, since each farmer hauls his own.

Magrouna is a relatively homogeneous group. In the other SCF/CDF site, Ouled Boughdir, Ayoun delegation of Kasserine governorate, the social situation is more complex. Here the problem was to gain the cooperation of six kinship groups ("arsh") with a tradition of rivalry among them. Eventually these six groups have formed a committee on which each of them has a single representative to handle common affairs. This group does not yet have a water point, so it is hard to say how they will manage it. One is currently under construction. The community (at least through its male members) participated in designing the civil constructions at the projected water point site. In particular, it is interesting to note that they have included a concrete slab on which women can wash clothes. This was requested by the women, and the message passed on through their menfolk.

### 5.3 Potential Problems of Water User Associations, including the Leadership Issue

Certain problems are perhaps foreseeable. Solutions cannot be specified at this point, since to do so would be to contradict the principles of participation, self reliance, and self management. They are problems of which the instigators of this innovative system should be aware.

#### (1) How to determine the membership of the associations.

By and large, there is probably a fairly fixed list of people who frequent a given water point. But Tunisians in this area sometimes seek water from different water points for different purposes, and there may also be seasonal variation. Thus there may be more or different users in the summer than in the winter; a breakdown in one water point may temporarily disperse its "members" to other points; and some households may systematically seek water from two or more points. Determining some kind of a

membership list is essential if small users are going to pay their share, since here the accepted pattern seems to be a monthly charge. This also simplifies bookkeeping. Furthermore, creating at least a core membership is essential if the health education and sanitation efforts are going to work. Membership in an association could be indicated by a sign on the water container, and occasional non-member users could be charged differently.

(2) How to fix the rates. In our conception, all motorized public water points will be charging for water, in order to avoid a sense of unfairness and distortions in use. However, it seems reasonable to expect each association to set its own rates, since the depth of the well and the number of users will vary from one water point to the next. Also setting one's own rates is a central part of self management. It may nonetheless be useful to set a range for rates within each delegation or for the entire area, to avoid the distortions mentioned above.

(3) How to establish local leadership. In principle it seems reasonable to expect that the committee will reflect the major social categories of the users of each water point. This might be according to big and small users, according to different kinship groups, or along some other axis. It is probably premature to expect women to be members of such committees, although the liaison officers should be alert to every possibility. On many sites, children predominate among the actual haulers, and it is not practical to assume that they will be represented on the committee. However, on many sites, and especially the larger sites where there is a drilled well and an appreciable amount of water, men are very frequent users, especially as haulers. So a committee composed of men would not be entirely a reinforcement of traditional patterns of dominance of children by parents, or of women by men, but would reflect the use pattern.

(4) How rural government officials play a role. Another issue in the creation of these committees is to determine whether government officials assigned locally (teachers and male health workers predominantly) should be encouraged or discouraged from serving on the committees. On the one hand they possess certain useful skills, and may be neutral figures; on the other hand to encourage them may give the impression that this is only another way to establish lines of state power and thus discourage true self-management.

(5) How to encourage good local leadership. A further issue is whether the selection of local leaders will produce good results. Here the experience of the Community

Development Foundation encourages us to expect good results. Tunisian culture does not encourage people openly to seek political leadership roles. The kind of leader most likely to be accepted is the one who is more or less drafted. However, when groups of men have to choose their leaders, it is generally the "most respected" man, typically aged between 35 and 55 years, who is chosen. Neither the oldest nor the richest is automatically chosen. Most leadership is situational, and it is hard for a single individual to begin to mobilize his fellows. Once chosen, however, he can participate effectively. The style of leadership is generally one of example rather than of hierarchies of dominance. People are less likely to give orders and more likely to set an example by starting in to work or to make the first contribution themselves. (The relationship between a government official, particularly one resident in the towns, and the "citizens" residing in the rural areas is much more likely to take on a coloring of superordination, marked by giving orders and advice without necessarily sticking around to see to the fulfillment of the instructions).

(6) Problems of literacy. Literacy is not widespread in the project area, even among men. Some pump operators use their sons, on school vacations, to keep records for them. The shortage of literate people may limit the choice of leaders, especially treasurers and general secretaries.

The prognosis for the successful adoption of the Water User Association model in Central Tunisia appears to be good. People (and the Government) are prepared to experiment with new ways to ensure potable water for the scattered rural populations. People are willing to make a reasonable contribution in money and in labor to secure potable water for themselves and their families. There is enough evidence in on tentative efforts to elaborate new institutions that one can be reasonably sure that a working model will be found and negotiated between the various interested parties. The purpose of this analysis, of course, is not to lay out such a model, but simply to argue that it is conceivable. Issues of equity, leadership, autogestion as opposed to a topdown control system, cannot be solved in a short time. Their resolution will require considerable imagination and tolerance on the part of all concerned. The people of Central Tunisia are ready to accept this responsibility.

#### 6. ABILITY TO PAY

This question can be approached in several ways. (1) As a percentage of disposable income; (2) as an ability to cover the

operations and maintenance costs of the water point; and, (3) in relation to current costs for water. Here we use elements of all three to develop our estimate, which is that by and large people are not only willing but able to pay what is necessary.

### 6.1 Disposable Income

We do not have reliable figures on disposable income, or on income, for this area. Perhaps further research for the project or independent of it would reveal these figures. They are complicated by the multiple sources of income that people have -- agricultural income, government and private sector jobs, family members working outside the area and sending money home, government subsidies and loans, perhaps others, and by the subsistence way of life in which families produce what they consume. However, the government figures for farm workers give a preliminary indication. The "Salaire Minimum Agricole Garanti" for an ordinary worker is set at TD 2.640 for an eight hour day. For certain specialized workers the figure is between TD 2.908 and 2.963. (These include tractor drivers, specialists in tree grafting, auto mechanics and the like). Such workers work 6 days a week and are entitled to 12 to 18 days of annual leave. They are probably relatively rare in the area. Actual salaries for agricultural work may run considerably higher in peak seasons but there are also many lower salaries. One of them is the salary paid to the pump operators on the CDTA potable water project, which is just under 2 dinars a day, 7 days a week, or about 60 dinars a month. This is equivalent to the salary paid to those who work on government "chantiers".

Some private farmers, even in dry land cultivation, do better than this if they have fruit or olive trees, and a small to medium herd of sheep. Others, where these features are absent, do worse. In dry land cultivation, the cereals are likely to be kept for home consumption, while the livestock (primarily sheep and goats, some cows) are for the market. Olives are more likely to be for home consumption, if the amount is small, and fruit for the market. In households where production for use predominates, a calculation of income is tricky. An educated guess would be that the average cash income of the poorer 80% of the population is on the order of 100 dinars per household per month. The Smith survey in July 1985 found that most households spent between 2 and 3 dinars a month on tea, soft drinks, cookies or cigarettes. These figures are not incompatible, and suggest that most households could afford a modest sum for water.

## 6.2 Costs of the Water Point

The principal costs of a water point under Central Tunisia conditions are (a) the salary of the pump operator, usually around 60 dinars a month, (b) the cost of fuel, (c) the cost of oil and other routine maintenance items, (d) the cost of transporting the fuel. Currently diesel fuel is sold for 210 mm a liter, and most pump sites appear to use around 200 to 300 liters a month, of which 120 are furnished by the government (from the PDR program, and through the local delegate). If we assume that the government contribution will cease, this makes for an above-average fuel cost of 500 liters a month (equal to TD105). If the other items can be covered for 35 dinars a month, this gives us a cost of 200 dinars a month. To be on the safe side we can add 50% and say TD 300. In order to cover these costs, the users would have to generate TD 300 per month for a motorized site. If the site only has small users, 300 families (equal to perhaps 2000 persons, which is a fairly standard figure given for the number of beneficiaries for a drilled well in a new territory) would be able to cover that amount by paying TD 1 a month. In one site in the delegation of Majel Bel Abbas, the users have fixed a base amount of TD1.700 a month, thus indicating that this kind of a figure is within reason. Moreover, most sites do not only have small users (defined as those who come by donkey with a pair of containers), but also have at least some who haul water in donkey-powered tanks, if not in tractor-drawn tanks. As we have seen, the Tunisian sense of fairness suggests that people like this should pay more for water. To the extent that such big users frequent a water point, it may be possible to hold the individual household contribution to a minimum. (One reason it is fair to make these people pay more is that the water they haul is more likely to be used for economic purposes such as watering a flock of sheep or irrigating young trees. On the other hand, if they are hauling water for sale to those who use it for household personal purposes, the equation is different).

## 6.3 Covering Current Costs of Water.

Currently those who haul water by donkey back or by hand have almost no cash outlay (only the cost of the containers and the donkey). On the other hand it is a fairly labor intensive activity. We do not have sufficient information about the ecology of water hauling, why it is frequently men who haul, why it is sometimes children; or what happens to the children during the school year, when water needs are less.

Those who haul water by donkey tank for themselves and their own use also have low cash costs -- the expense of the tank (ca. TD 400 to 500) and donkey. Again this is a job for men or boys. People hauling this amount of water are unlikely to be selling it, but they are quite likely to be using it either to water sheep or trees. This economic use is recognized by the Governorate Rural Development Program, which will make loans to purchase such a tank.

Those who purchase water have the highest money costs of all. Depending on the locality, and within the locality on distance from the water point, they are paying from 4 to 8 dinars for 3000 liters. If we assume TD 6 as an average, this gives a figure of TD 2 per cubic meter -- compared with TD .080, the SONEDE price for the first 20 cubic meters. If a family is only using this water for personal use (drinking, cooking, washing), and stores it in a cistern, the 3000 liters will probably last a week or so, depending on the size of the family. This would give a daily cost of at least 300 millimes, assuming a fresh load every ten days, 500 mm if there is a fresh load every 6 days.

Actually the figures reported by Janet Smith on the basis of her summer 1985 study are higher, in the neighborhood of 3.60TD/1000 litres in the summer. Obviously this kind of a cost is considered burdensome. Probably the amount of time spent hauling water from a distant water point is also considered burdensome -- even one 1 km away can represent a minimum round trip time of an hour, assuming almost no waiting time. From a strict cash point of view, there are two situations in the rural areas -- those where the only cash outlay is for the equipment, and those who are paying a rate 25 times higher than the urban rate. From the effort point of view, the people in the first case probably spend a minimum of 3 hours a day hauling water, while those in the second case have their water stored in a cistern at their door.

It is possible to calculate the cost of water to a family that fetches it itself from a water point. If we assume that the opportunity cost of a man's labor is at least equal to the "chantier" salary of 1.95 TD per eight hour day, then each hour of adult labor would be worth 250 mm. The labor time of an adolescent or a child can be calculated as "worth" half that, of 125 mm an hour. Thus in the case where the trip to fetch water takes 2 hours, the "cost" would be 500mm per load brought by a man, and 250 mm for one brought by an adolescent or a child. Since an average load might be estimated at 100 liters (80 is very common, but there are some that run up to 120 or

140 liters per load), this should result in a "cost" per cubic meter of water of five dinars in the case of the adult man, and of 2.500 in the case of the younger person. This is comparable to, or higher than, the cost of water hauled by tractor-drawn tank.

#### 6.4 Willingness to pay and participate.

Respondents to the formal, small-scale Smith survey carried out in the project area in July 1985 appeared to be fully supportive of the idea of creating water user associations. This survey was carried out in areas designated for possible inclusion in the proposed project, and also at a time of year when concern about water is at its height. This survey found that in areas where paying for hauled water was common, all respondents were willing, even enthusiastic about, participation in a water user association. In areas where most people went for their own water, over 90% of the respondents supported the idea and were prepared to contribute money and labor. This report concludes that "response to the idea of water user associations and user fees was overwhelmingly positive".

The Smith study and our own observations indicate that by and large people are ready, willing and able to pay at least a modest amount for water. Our calculations here suggest that the amount people are likely to want to pay is ample to cover the running costs of the water point.

### 7. SOCIAL IMPLICATIONS OF THE HOUSE CONNECTION MODEL

The previous potable water project gave equal weight to improving springs and existing wells, and to the drilling of new wells. The emphasis was on the use of low-cost and innovative technologies in the provision of potable water to the scattered populations of central Tunisia. In the current project, the emphasis is on drilled wells and extensions (extending water from a plentiful source to an area at some distance where there is no good opportunity to drill a well because of the depth of the water table). In addition to these two types of interventions, the project will include two experiments with house hookups in areas with scattered populations.

Here there are two problems. One of them is the technical problem of supplying water to these houses at a reasonable cost. The other is the human organizational side, the ability of people to manage such a system of their own. This is where the so-called "New Mexico" model comes in. It is worth experimenting with such a system to see whether it can feasibly

be applied in Tunisia. It is particularly appropriate for central Tunisia because of the high number of houses that are not in large agglomerations where more traditional house hook-up systems are workable.

The ideal situation for such an experiment would be in an area where there are a number of houses that are fairly close to one another, perhaps averaging around 100 meters apart. Such an area would not count as an agglomeration in the SONEDE sense, yet it would not pose the problems of a truly scattered community. (An appropriate approach for such communities may be worked out if the project is successful in this intermediate case). The community will form a water user association, which would be responsible for determining the water use of each household and collecting the money owed from that person. The water user association would work in the same manner as those around the drilled well sites and extensions, but a more detailed discussion of problems must await a decision on basic design features.

Considerable care should be given to the selection of the right sites for this experiment. Substantial clusters of houses should be left for the SONEDE expansion plans. The information generated through the Resource Mapping Study would be essential for selecting the site where the experiment would have high chances of success and produce interesting lessons.

## 8. CONCLUSION

In 1978 the most likely general pattern of development in Central Tunisia seemed to be that the area would move forward into a pattern of growth centering around irrigation and some improvements in cereals and pastoralism. If this kind of growth came to pass, then some of the migrant population would be attracted home. In general this is what seems to have happened.

There has been a period of seven years of modest but real growth in the area, measured by such indicators as plantations of trees, improved houses, additional roads, more cars and trucks, more schools, and so on. The area does not seem to have become entirely devoted to producing labor for the coastal or foreign economies, but sustains within it many economic opportunities. The gap between the center and the coast remains, particularly in the general standard of living. It is likely that an improved agricultural situation has contributed to this relatively cheerful picture for Central Tunisia, and that the spread of irrigation is a major component of

151

agricultural growth. At the same time, the spread of infrastructure, and in particular of potable water, into the rural areas of the governorate, has contributed towards fixing the productive activities. This does not mean that there is not still considerable poverty in the area, or that it is no longer possible to see people using animals for threshing grain or women washing wool by a pool of turgid water. There are still children with skin diseases, and diarrhea is a substantial problem in the summer. Per capita consumption of water is still at or below international norms, and the relatively sparing use of water contributes to some of these health problems. Some progress has been made; more remains to be made before the gap between the Center and the Coast can be significantly reduced.

ANNEX I

FINANCIAL ANALYSIS

1. PROJECT ANALYSIS

The proposed project of \$9.89 million is composed of technology transfer (creation of water points), and local and regional institutional development. The component creating water points totals \$6.4 million (including inflation) which when divided by the minimum number of water systems to be created comes to approximately \$213,000 per system. Assuming the average site will service 300 households of 5.6 persons each (1680 people), the average capital cost per beneficiary, including inflation, will be about \$125. This is considered reasonable under the conditions existing in rural Central Tunisia. Throughout the project the least cost solutions to technical problems will be sought.

Furthermore, the beneficiaries of these wells and the other already existing, motorized public wells will make payments sufficient to cover the operation and maintenance of the wells. This fee will be affordable to the local population, and in many cases will be less than they are paying for water at the present time. Thus once AID financing ceases, there will be relatively little demand for further GOT expenditures with the exception of a minor portion of the CTDA budget.

The financial effect of the proposed project on its beneficiaries is difficult if not impossible to quantify. It is likely that greater access to water will result in small increases in the size of farmers' herds and in some cases the creation of small garden plots. The social benefits referred to in the economic analysis will also no doubt lead to a certain increase in productivity. This, however, will not lead to major increases in rural incomes. Instead, the major impact will be a considerably enhanced quality of life for the rural population of rural Central Tunisia. Throughout the design of the project, emphasis has been placed on simplicity and local participation.

CTDA actual expenditures for the period 1979-1984 are shown at Table I-1. The tenfold increase from 1979-1983 has been managed well; annual external audits highlight only relatively minor problems. Although detailed data was not available for review, CTDA estimates that while AID funds accounted for almost 80 percent of funding in 1979, by 1986 the GOT contribution will be almost 70 percent. Expenditures under this project are expected to be greatest in 1988, when they would be slightly above U.S. \$2 million. Even if CTDA expenditures level off at the 1984 rate of slightly over US \$6 million, an additional \$2 million would represent only 25 percent of total expenditures, which should be easily absorbed and managed.

TABLE I-1: CTDA - ACTUAL EXPENDITURES  
1979 - 1984  
(In TDs)

Dépenses Annuelles	1979	1980	1981	1982	1983	1984
Dépenses de Fonctionnement	381,317.147	623,804.868	694,798.569	765,149.627	959,096.184	949,969.255
Dépenses de Capitaux (Equipement)	45,646.121	864,604.726	2,791,228.583	2,776,884.395	4,546,015.218	3,474,108.034
Subvention Crédit en Nature	147,623.537		300,374.908	216,351.212	197,255.841	178,048.332
	574,586.805	1,488,445.954	3,786,402.060	3,758,385.234	5,702,367.243	4,602,125.621

\* / Decrease from 1983 - 1984 is due to transfer of delegations to a new Office de Mise en Valeur - Sidi Bou Zid

## 2. WATER USER ASSOCIATIONS

At the moment the Water User Associations (WUAs) are new and unproven, but indications based on the few that are now operational suggest that they can and will operate efficiently. It is estimated that 85 percent of the WUAs will achieve 100 percent cost recovery. It was not possible to obtain precise operating and maintenance costs for several water points to use as examples. Budgeted costs (but again not actual costs) for the 40 wells (1984) operated and maintained by the PDR in Kasserine, however, were obtained and are as follows:

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Pumpists	24,000	24,000	28,800	28,800	28,800
Fuel, oil, etc	34,100	34,100	34,100	48,500	48,500
Repairs, spare parts, mechanics	2,000	2,000	2,500	3,000	3,300
Maintenance team	<u>9,600</u>	<u>9,600</u>	<u>10,800</u>	<u>13,200</u>	<u>13,200</u>
Total Costs (TD)	<u>69,700</u>	<u>69,700</u>	<u>76,200</u>	<u>93,500</u>	<u>93,800</u>

As noted in the Policy and Institutional Analyses, these PDR costs must be supplemented each year by additional funds from the Governor's Council. That budget was not available for the review during the design. The line item for "repairs, spare parts, and mechanics", if for approximately 40 wells, would average out to only TD 82.5 (slightly over U.S. \$100.00) per well, which seems low. Many of these wells, however, are fairly new, and have thus not had many repair problems. It is impossible to predict potential repair costs. The design has built in a monitoring function for wells through both the proposed Unité d'Autogestion and TA to be supplied to the PDR Brigade. For the purposes of this analysis, however, the PDR figures supplied above will be used as indicative.

By increasing the number of wells by 30, the total cost estimate for the 70\* wells at the time of project completion would be on the order of TD 164,150 for an average annual operating and maintenance cost of TD 2,345 per well. This works out to approximately TD 195 per month per well although obviously there will be many with higher operating costs as well as many with lower costs also. In spite of the relatively low level of disposable income in Central Tunisia, it appears sufficiently high to enable users to make the necessary payments. In other words the project is affordable to its beneficiaries.

On the other hand full cost recovery of the operating and maintenance costs of these water points represents a real saving to the GOT which has heretofore born the entire cost of the

\* / Includes 30 Phase II points and approximately 40 maintained by PDR/Kasserine.

1167

system. The money thus saved can be utilized for other high priority projects which may benefit the people of the region. It has therefore been included in the project budget as a host country contribution to the total cost of the proposed project.

Under the proposed project a WUA must be in existence before a well becomes operational. The GOT will advance the WUA an amount equal to one month's operation and maintenance, and henceforth the WUA will be on its own. For those few WUAs unable to recover operation and maintenance costs fully, the GOT will of necessity have to make minor subventions. It is anticipated that as the system gains general acceptance throughout the region, these subventions will decline proportionately.

There will be three major members of each WUA: the president, treasurer, and pumpist. Each will require a certain degree of training to be provided through the Unité d'Autogestion. It is assumed that at the time of project completion most if not all of this training can be discontinued as the community as a whole gains experience in the administration of a WUA.

Each WUA will need to handle its accounts through a financial institution. The two options are the banking system and the postal savings system. Since the largest bank, the Banque Nationale de Tunisie (BNT) only has branches in Kasserine, Sbeitla, Thala, and Sbiba and since it only provides a two percent return on current balances, the WUAs will probably prefer to open accounts at local post offices. These are far more numerous and offer 6.5 to seven percent interest on current balances (depending on the length of time cash is held in an account). Each WUA will make its own decision on this matter.

SONEDE is projected to assume responsibility for rural water supply by the year 2000 (except for dispersed populations of 100 or less). No major capital costs are anticipated between project completion and the year 2000 at which time SONEDE will be responsible for improvements and extension of the system.

Cost estimates built into Project Budgets are shown in Table I-2.

**TABLE I-2 : STANDARD COST PROJECTIONS PROVIDED**  
**BY USAID/TUNIS FOR DESIGN**

**INFLATION RATE:** U.S., third country -- 5% compounded annually  
Tunisian -- 12% compounded annually

**EXCHANGE RATE:** .700 TD = \$1.00 U.S. (Life of project)

**I. PERSONNEL**

**A. EXPATRIATE**

- Long-term: 1 person year \$130,000
- Short-term: 1 person month \$11,000

**B. TUNISIAN**

1. Consultant: 1 person month 1,500TD
2. Staff
  - Grade A: 10,000TD/year
  - Grade B: 7,500TD/year
  - Grade C: 5,000TD/year
  - Grade D: 2,500TD/year
3. Day Labor
  - skilled 8TD/day
  - unskilled 5TD/day (approx. minimum wage)

**II. COMMODITIES**

- 4X4 vehicle \$17,500
- sedan \$12,000
- pick up \$12,000

**III. O+M**

POL estimate 1 veh/month = 120 TD/month = 1440 TD/year, say 1500 TD/year (based on estimated 3000 km/month X 10k/1 times .400 for POL)

**IV. TRAINING**

Long-term participant training \$15,000/year  
Short-term participant training \$3,000/month

Third-country training \$2,500/month

In-country - varies wildly

- For office equipment, think in terms of \$15,000 for: 1 computer (with all necessary hardware and software), 1 typewriter (French), 1 typewriter (Arabic), some calculators, desks, chairs, a phone, etc.

- Each car gets a driver, a new office gets a secretary

163

ANNEX J

ECONOMIC ANALYSIS

The volume of water available in Tunisia is limited. As of mid-1982, about 91% of Tunisia's urban population had access to potable water while in rural areas only about 46 percent had such access. GOT policy envisages a massive commitment to improve access to water in rural areas by the year 2000. The GOT is giving priority to developing the less favored regions of Tunisia and in particular to areas such as Central Tunisia in order to reduce regional disparities. It is estimated that out of Tunisia's 4,500 villages, only 1000 have public water systems. This estimate includes areas in which the population is dispersed in isolated locations.

The Project area is one of the poorest of the country, and its population is well aware of this fact. They strongly support any effort to reduce existing inequities, in particular those which will improve their quality of life. Like air, potable water is a basic need for a healthy and productive population. The project being proposed is designed to meet this most basic of human needs.

By its nature, however, the project under consideration does not lend itself to a normal economic analysis as applied to projects clearly designed to have marketable economic outputs leading to increments in income and productivity. Under normal circumstances the minimum requirement would be to recover the total costs of a project, both capital investment and recurrent costs. Due to the social nature of this project, however, and to its high political priority, it is likely that neither of these objectives will be met in full.

One of the basic objectives of this project is to introduce the concept that rural inhabitants should pay for water which they have previously received free of charge (with the exception of those few who pay water carriers to deliver water to their homes). Urban inhabitants have long paid for the water they consume, and this principal is now fully accepted. Recent social analyses indicate this solution is acceptable to the vast majority of inhabitants, many of whom pay professional water sellers more than they would pay under the proposed project. Others spend as much as 6 3/4 hours each trip to a water source with an average 16.31 trips a week in the summer. They also would readily pay a small fee for a closer water supply. It is anticipated that after an initial break-in period all users of water from project wells and from existing motorized government water points in the project area would be paying for this water.

Nevertheless, this is clearly a sector which needs considerable subsidization in order to assure the success of the project. Its high political priority allows the Government to make the necessary funds available. Due to the rapidly mounting financial burden of providing social services (including potable water) at free or below-cost delivery, the GOT is reviewing the cost structure of these services and considering the introduction of some user fees.

The project paper at Section 2.4 and elsewhere discusses the current IBRD 7th Loan to SONEDE. The loan includes considerable direct governmental subsidization, and the economic analysis to be carried out for the proposed AID project will be similar to that done by the IBRD.

Water is essential for sustaining life, and a potable water supply is a basic service which all governments must make available in cities and villages. Many benefits derive from such projects, benefits to society at large. The many health and environmental benefits that the proposed project would generate, such as reduced expenditures for health care, lower infant mortality, workers' higher productivity, improved learning by children who would have to devote less time for carrying water, womens' higher productivity, would produce a high economic return on the proposed investment. These kinds of benefits are, however, difficult to quantify, and a meaningful economic rate of return cannot be calculated.

Therefore the application of a cost-benefit analysis appears more appropriate and requires delineation of the benefits and costs of the proposed investment in economic terms. Due to the high cost of investment for each beneficiary and due to the new policy initiative of making beneficiaries pay for their water, the assumption is being made that the capital cost of the project equals the unquantifiable social benefits. The cost recovery would be limited to the recurrent costs of operating and maintaining all the public wells in the Governorate of Kasserine, including some "first level" repairs to be specified during the first two years of the project. Replacement of non-functioning pumpsets by WUAs is not foreseen during this project period.

While the project does not lend itself well to cost-benefit analysis, some economic indication of the project's viability

can be estimated by calculating what is needed to generate a reasonable return on the project's recurrent costs. As noted in Annex I Financial Analysis, recurrent cost estimates available are only indicative because so many of the wells are new and have yet to encounter any "first" or "second" level repairs. Data which are available (TD 2,345/well/year), however, can be used as indicative of all operating and at least some "first level" maintenance costs. With the opportunity cost of capital for Tunisia estimated to be 15 percent, a 15 year life of project was assumed. Present GOT policy calls for SONEDE to provide all water to rural areas by the year 2000. The proposed project would commence disbursement in 1986. It is assumed that at a minimum the proposed project would add an additional 30 public water points to the approximately 40 motorized points already in existence. The size of the contribution to be made by the beneficiaries has been determined by expanding the 1984 actual costs proportionately. Benefits are expected to begin in the first year with the final water points becoming operational at the end of the fifth year. In all cases the least cost solution to a technical problem will be utilized. Table J-1 consists of a calculation of benefits; based on an illustrative cost recovery plan. As the project commences and initial studies are completed, the estimate of flow of cost recovery will be refined.

The result of this exercise implies that the project needs to generate almost \$450,000 annually in benefits in order to be considered a viable economic initiative. On the assumption that there will be a minimum of 70 motorized water points with functioning WUAs and system of user fees, each servicing approximately 300 households, the monthly contribution required to meet the annual cost of maintaining the wells would be on the order of TD 1.250 per household per month. This fits well within the current range of payments to WUAs of between TD 1.000 and 1.700 per month and also fits within the range of affordability. While this assumes a payment rate of 100%, it also excludes extra charges for large water users, and so the WUAs should have little if any problem in meeting recurrent project costs. The project budget reflects the substantial benefits received from the beneficiaries through their monthly payments for water service and the resulting savings to the Government to be utilized for other high priority expenditures.

The high social and political priority of the proposed project argues for grant financing. Following the criteria set forth in STATE 178281 dated 12 June 1985, the social benefits are broadly diffused, and in this case full cost recovery is clearly not practical. The innovation that beneficiaries will pay for recurring costs is a great step forward on its own. This latter point represents a highly innovative concept whose time in a period of austerity in Tunisia clearly has come. This is a pilot or demonstration project that may well be copied

1.91

CALCULATION OF BENEFITS REQUIRED TO JUSTIFY PROJECT INVESTMENT

<u>Year</u>	<u>GOT</u>	<u>Costs (\$000)</u>		<u>Discount Factor (15%)</u>	<u>Present Value of Project Costs(\$000)</u>	<u>Benefits</u>	<u>Present Value Of Investment</u>
		<u>Beneficiaries</u>	<u>Total</u>				
1	99.9	144.0	243.9	1.00	243.9	0.10x	.100
2	107.6	164.1	271.7	.870	236.4	0.30x	.261
3	108.9	184.3	293.2	.756	221.7	0.50x	.378
4	108.9	204.3	313.2	.658	206.1	0.70x	.461
5	144.9	224.4	369.3	.572	211.2	0.90x	.515
6	74.6	234.5	309.1	.497	153.6	1.00x	.497
7	74.6	234.5	309.1	.432	133.5	1.00x	.432
8	74.6	234.5	309.1	.376	116.2	1.00x	.376
9	74.6	234.5	309.1	.327	101.1	1.00x	.327
10	74.6	234.5	309.1	.284	87.8	1.00x	.284
11	74.6	234.5	309.1	.247	76.3	1.00x	.247
12	74.6	234.5	309.1	.215	66.5	1.00x	.215
13	74.6	234.5	309.1	.187	57.8	1.00x	.187
14	74.6	234.5	309.1	.163	50.4	1.00x	.163
15	74.6	234.5	309.1	.141	<u>43.6</u>	1.00x	<u>.141</u>
					<u>2006.1</u>		<u>4.584</u>

C/B = 2006.1/4.584 = 437.6

GOT = 1000

throughout the country should it prove successful. So far every indication suggests that it will be successful. At the same time new approaches to water delivery will be attempted: the so-called New Mexico model where there are individual house hook-ups, and extensions so that existing wells can service considerably larger areas. Furthermore, there is a level of risk in that some of the wells drilled may not produce potable water or any water at all, and also that the Water User Associations may not prove replicable elsewhere.

At the same time, the United States has been active in the Kasserine Governorate since 1977 and has a strong proprietary interest in its economic development. Indeed, one of the three primary elements of USAID/Tunis strategy argues for continued assistance to CTDA. For these reasons it wishes to exercise substantial leverage on the proposed project's implementation and results. Needless to say the collection of fees for potable water is politically sensitive in Tunisia, particularly in light of the recent civil unrest following various GOT efforts at lifting subsidies.

In conclusion, a strong case exists that the proposed project should be financed as a grant.

105

CALCULATION OF BENEFITS REQUIRED TO JUSTIFY PROJECT INVESTMENT

Year	GOT	<u>Costs (\$000)</u>		<u>Discount Factor (15%)</u>	<u>Present Value of Project Costs(\$000)</u>	<u>Benefits</u>	<u>Present Value Of Investment</u>
		<u>Beneficiaries</u>	<u>Total</u>				
1	99.9	144.0	243.9	1.00	243.9	0.10x	.100
2	107.6	164.1	271.7	.870	236.4	0.30x	.261
3	108.9	184.3	293.2	.756	221.7	0.50x	.378
4	108.9	204.3	313.2	.658	206.1	0.70x	.461
5	144.9	224.4	369.3	.572	211.2	0.90x	.515
6	74.6	234.5	309.1	.497	153.6	1.00x	.497
7	74.6	234.5	309.1	.432	133.5	1.00x	.432
8	74.6	234.5	309.1	.376	116.2	1.00x	.376
9	74.6	234.5	309.1	.327	101.1	1.00x	.327
10	74.6	234.5	309.1	.284	87.8	1.00x	.284
11	74.6	234.5	309.1	.247	76.3	1.00x	.247
12	74.6	234.5	309.1	.215	66.5	1.00x	.215
13	74.6	234.5	309.1	.187	57.8	1.00x	.187
14	74.6	234.5	309.1	.163	50.4	1.00x	.163
15	74.6	234.5	309.1	.141	<u>43.6</u>	1.00x	<u>.141</u>
					<u>2006.1</u>		<u>4.584</u>

C/B = 2006.1/4.584 = 437.6

ANNEX K

PROJECT ADMINISTRATION AND MANAGEMENT

The roles and responsibilities of the various Tunisian entities engaged in project implementation are discussed at Annex F, Institutional Analysis. The purpose of this annex is to put in tabular form the respective roles/responsibilities of AID and the GOT regarding management of the critical Project inputs of Technical Assistance, Commodities and Training. The fourth major Project input--Construction--is thoroughly discussed in Annex G, Technical Analysis, although construction technical assistance, commodities and training are highlighted herein. The fifth Project input--the operations and maintenance payments of the WUA--is discussed at Annex H, Social Analysis, and technical assistance, commodities and training related to that input are highlighted in the pages that follow.

PROCUREMENT PLAN NARRATIVE

As soon as the conditions precedent set forth in Section 4.1. in the Grant Agreement are met (i.e. ninety days after signing the Agreement), USAID will engage the services of population and mapping study research specialists, a local organization research specialist, a health education research specialist and a spatial research analyst. (All of the foregoing comprise the "Water Resources Study," which is referred to in Section 4.2. of the Project Grant Agreement.) At the same time USAID will sign the personal services contract (PSC) for assistance in Project management.

As soon as the conditions precedent set forth in Section 4.2(a) are met (i.e. on or about 31 December 86), USAID will engage the services of one US maintenance specialist (24 person months) and one Tunisian maintenance specialist (24 person months).

As soon as the conditions precedent set forth in Section 4.2(a) are met, CTDA will negotiate and sign a host-country contract with a Tunisian Architectural and Engineering (A&E) firm. These services (estimated to be 37 person months) will be required periodically throughout the life of project. In 1988, CTDA through a host-country contract will engage the services (2 person months) of a PVC specialist. As appropriate, CTDA, through host-country contracts, will engage presently unspecified services (32 person months) to assist the Unité, DRE and RSH in Project implementation.

170

USAID will engage the services of a U.S. procurement services agent (PSA) for procurement of the following commodities: four utility vehicles, one electrical log, one air hammer with bits and two conductivity bridges. The Project Authorization includes a source/origin waiver for four EEC manufactured vehicles. Along with the procurement of the electric log, the PSA will be requested to procure four person months of technical assistance to train Tunisian technicians in its operation. The air hammer should be compatible with an Ingersoll Rand TH 60 drilling rig presently operating in Tunisia. All commodities and technical assistance should be provided to CTDA not later than 30 June 87.

During the first year (1986) of the Project, CTDA will procure three vehicles: two for the Unité and one for the Regional Health Service. In 1987 the CTDA will procure six pump sets and the required amount of PVC. In 1988 and 1989 the CTDA will procure six pump sets each year. CTDA will procure 12 pump sets and three vehicles for the Unité in 1990.

USAID will engage the services of evaluation teams in 1987 and 1989 for Project evaluation.

ATTACHMENT K-1

SUMMARY PROCUREMENT PLAN: COMMODITIES

Resp	Item	Date to order by	Date to receive by	Probable Source	End User	Est. Price CIF Tunis
USAID	2 Light weight pick-up trucks	1/86	6/86	Tunisia/Europe	RSH	\$ 24,000
	2 Light weight pick-up trucks	1/86	6/86	Tunisia/Europe	Maintenance Brigade (PDR)	\$ 24,000
CTDA	1 Long Wheelbase Land Rover	1/86	12/86	U.K.	CTDA/Unité d'Autogestion	\$ 17,500
	1 Sedan	1/86	6/86	Tunisia	CTDA/Unité d'Autogestion	\$ 12,000
	1 Light weight pick-up	1/86	6/86	Tunisia	Public Health	\$ 12,000
	3 Sedans	1/90	6/90	Tunisia	CTDA/Unité d'Autogestion	\$ 36,000
USAID	1 ea, Electric Logging Unit, Van mounted	1/86	12/86	USA	DRES	\$ 110,000
USAID	1 ea, Air Hammer and 4 bits for TH-60 rig	1/86	12/86	USA	RSH	\$ 20,000
USAID	2 ea, wide range water quality conductivity bridges, field type	1/86	4/86	USA	RSH	\$ 1,200
CONT	PVC pipe for extension, 150 mm, 10 bar rated length and fittings unknown	7/87	1/88	Europe-Tunisia	CTDA	\$ 25,000
CONT	PVC pipe for NMM 100 mm, 10 bar rated length and fittings unknown	7/87	1/88	Europe-Tunisia	CTDA	\$ 25,000

(Cont'd)

(Attachment K-1)

CTDA	Pump units for well points (30 ea):					
	6 ea	7/86	1/87	Europe	CTDA	TD 74,400
	6 ea	7/87	1/88	Europe	CTDA	TD 78,000
	6 ea	1/88	7/89	Europe	CTDA	TD 78,000
	8 ea	7/89	1/90	Europe	CTDA	TD 109,000
	4 ea	1/90	7/90	Europe	CTDA	TD 57,600

Note: Recommended 6 inch dia. Well screens (PVC) for four (4) wells to be supplied by well construction contractor as required (approximately 400m)

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SUMMARY PROCUREMENT PLAN: TECHNICAL ASSISTANCE

Resp	Type and Quantity	SOW Final	Date Needed	Probable Source & Mode	End User	Estimated Cost
USAID	Water Resources Mapping Study (50 pm TA)	10/85	1-6/86	US (SARSA) <sup>1</sup>	CTDA	\$ 427,000
CTDA	A&E Contract (37 pm LOP)	10/85	1/86-LOP	Tunisia (IFB)	CTDA/AHA	\$ 165,000 LOP
CTDA	"E" Log Trainer (4 pm)	1/86	1987 (with "E" Log)	US ("E" Log Co.)	DRE & RSH	\$ 49,000
USAID	Evaluation (6 pm)	1/87	4-5/87	US (SARSA)	CTDA & AID	\$ 69,000
CTDA	Tech. Training - unspecified (2 pm)	1/88	1988	US or Tunisia	DRE & RSH	\$ 28,000
USAID	Local Organization Specialist (2 pm -86; 1 pm /87, 88, 89, 90)	1/86	4-5/86 4/87; 4/88; 4/89; 4/90	US (SARSA 8 (a) sub-contract) <sup>2</sup>	CTDA/Unité	\$ 80,000
USAID	Health Non Formal Education Specialist (same sched. as Local Orgs)	1/86	4-5/86 4/87; 4/88; 4/89; 4/90	US (SARSA 8 (a) sub-contract) <sup>2</sup>	CTDA/Unité	\$ 80,000
USAID	Spatial Analyst (2 pm)	1/86	6-7/86	USA (SARSA)	CTDA & Reg. Pot. Water Committee	\$ 22,000
USAID	Mechanical Equipment Training Specialist (1 US x 2 years; 1 Tunisian x 2 years)	1/86	6/86-5/88	US (SARSA) <sup>3</sup>	Maintenance Brigade	\$ 373,000
CTDA	30 pm Tunisian S-T in research or training	var.	6pm/yr	Tunis (PSC)	CTDA/Unité	\$ 57,000
USAID	Evaluation (6 pm)	1/89	4-5/89	US (SARSA)	CTDA & AID	\$ 76,000

(Cont'd)

Footnotes:

1. To preserve current momentum and make best use of previous experience, continuation of use of the SARSA Cooperative Agreement with the Institute for Development Anthropology (IDA) in collaboration with Clark University is recommended. IDA/Clark have had substantial experience in resource mapping in Africa, notably in the Sudan and Kenya. Substantial involvement of Tunisian geographers, either as individuals or through a firm, is recommended.
  2. Following guidance on use of women and minority-owned firms, accepting the desirability of limiting USAID/Tunis workload and maintaining institutional continuity; and wanting the best possible expertise; it is strongly recommended that SARSA sub-contract directly with Donnelly Roark and Associates of Washington, D.C. for these services.
  3. Use of host country personal services contracts paid by USAID but administrated by CTDA would be most desirable. Apparently, CTDA can only contract for 6 months at a time. In that a direct AID PSC would not offer the tax advantage to attract an American to Kasserine, continuing use of SARSA is recommended.
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ATTACHMENT K-3: SCOPES OF WORK

TECHNICAL ASSISTANCE

This attachment provides summary scopes of work for the known technical assistance proposed under this project. Separate scopes and pro forma budgets for the Water Resources Mapping Study and the A&E contract follow this discussion.

1. Mechanical Equipment Trainer: The services of one American and one Tunisian senior mechanical equipment trainer are required for two years each. The objective of this long-term technical assistance is to provide on-the-job training to the Maintenance Brigade of the PDR to enable it to better support the dispersed rural water supply systems in Kasserine Governorate. Assistance to a maintenance crew in North Gafsa and Sened may also be provided.

The focus of the technical assistance is on establishing practical, efficient systems for maintaining approximately 70 motorized and an unspecified number of unmotorized public water systems in rural Central Tunisia. The TA will work with a crew of skilled laborers: to establish schedules for and to undertake routine preventive maintenance on pumpsets; to establish learning objectives for and to undertake periodic on-the-job and more formal training of individual guardian-pumpists for the water systems; to establish desired inventory levels for, to recommend inventory procedures for, and to assist in the ordering of spare parts for major repair of public potable water systems in the region; to identify training needs for and to assist in arranging and/or conducting training for small, private sector mechanics engaged in public water system maintenance and repair; and to generally reorient the Maintenance Brigade towards a more initiating rather than responsive role.

The Mechanical Equipment Trainers will be based in Kasserine, in Central Tunisia, and will work with the Programme de Developpement Rural (PDR) at the Governorate. They will coordinate all work with the Unite d'Autogestion at the CTDA. Each should be conversant in English and French, and the Tunisian is expected to be fluent in Tunisian Arabic. A college or university degree is not required, but extensive experience in mechanics and equipment repair is. The American must have at least 5 years proven experience in a developing country. See the footnote at Table K-2 for a discussion of contracting modes.

2. Local Organizations Specialist: The services of a Local Organizations Specialist with extensive experience in working with rural people in group formation are required on a repeating basis for a five year period. The overall objective of the work is to assist the new Unite d'Autogestion of CTDA in establishing the methodology for initiating, organizing, training and monitoring at least 100 Water User Associations in Kasserine Governorate, North Gafsa and Sened. Some assistance to the CTDA/AHA and various Local Committees may also be required.

The focus of the work will be on developing methods for institutionalizing newly formed Water User Associations. To date, this work has been a virtual "one man show". A more formalized system for establishing initial contacts with water users around a proposed or existing site; determining the membership in the association (i.e. the number and type of users); determining management needs of each association (i.e. number and types of officers); establishing baseline data on human and animal water use; determining training and monitoring needs; and planning and scheduling the above must be established. The consultant would work in collaboration with the newly established CTDA/Unite d'Autogestion in these and other tasks. S/he would also assist the Unité in developing its own workplans to carry out the work. Finally, s/he would assess needs and make recommendations for short-term training for Unite staff.

The consultant should be prepared to spend two months in 1986, and one month each year thereafter, in Kasserine, Central Tunisia. Fluent French and/or Arabic is absolutely required. The consultant should have a graduate degree in the Social Sciences and a minimum of five years experience in similar work in developing countries in Africa and/or the Middle East.

2. Health Non-Formal Training Specialist: The services of a Specialist in Non-Formal Training in Public and Environmental Health are required for two months in 1986 and one month each year thereafter for the five year life of project. The objective of the consultancy is to work with the Health and Sanitation Education division of the Kasserine Regional Public Health Directorate in identifying needs, developing curriculum and materials, producing materials and training modules, and training local persons in improved health and sanitation practices related to provision of potable water.

The Health and Sanitation Education Division has a number of materials and training modules that are applicable to the subject matter but inappropriate for use in rural Kasserine. The consultant will work with the staff of the division to better establish needs, pre-test materials and develop final materials and modules more suitable for use in the environment. In collaboration with the Local Organizations Consultant and the

staff of the Unite d'Autogestion, s/he will work with the Division to develop annual workplans that complement and reinforce the work of the Unite with rural Water User Associations (see above). S/he will also assess needs and recommend short-term training for staff, if indicated.

The consultant will be required for two months in 1986 and one month each in 1987, 1988, 1989 and 1990, at the same time or overlapping with the Local Organizational consultant discussed above. S/he should have a graduate degree in public health and/or the social sciences and professional experience in both. Fluency in French and/or Arabic is absolutely required. The consultant must have a minimum of five years previous experience in non-formal public health and/or environmental sanitation education in developing countries, preferably Africa and the Middle East.

3. Spatial Analyst: The services of a Spatial Analyst (Geographer) are required for two months in 1986 in Central Tunisia. The objective of the consultancy is to assist the Regional Potable Water Committee of Kasserine Governorate, in establishing more effective criteria to maximize investments in public potable water supply in the region. Through this work, the consultant will also assist the Planning and Evaluation Unit, the AHA and the Unite d'Autogestion of the CTDA in spatial analysis to determine the best locations for the proposed 30 boreholes, 4 extensions and 2 house hook-up experiments to be financed by AID in this project.

Under no circumstances should these services be engaged until the completion of the proposed Water Resources Mapping Study (see K-2), and it may be desirable to have this consultant associated with that study. Using maps and data generated by the Study, the consultant will work with the CTDA geographer in the Planning and Evaluation Unit, the Engineers in AHA, and the Social Scientists in the Unite d'Autogestion to determine optimal placement of the AID-financed systems. S/he will then observe a meeting of the Kasserine Potable Water Committee as it reviews the proposals, and work with the CTDA officers to adjust and refine recommendations based on the Committee's desires. It is hoped that the two products of the consultancy will be the list of sites proposed for AID financing as well as a more comprehensive list of site selection criteria to be used by the Committee in maximizing the investment of other financiers, including the GOT. Of particular importance will be consideration of criteria for extensions of existing systems.

The consultant should have a PhD in Geography or Regional Planning and demonstrated professional experience in resource

115

mapping and planning. Fluent French and/or Arabic is absolutely essential. The consultant should have a minimum of 5 years experience working in similar tasks in rural areas developing countries, preferably the Middle East or Africa.

DRAFT SCOPE OF WORK

WATER RESOURCES MAPPING STUDY

The objective of this contract is to facilitate a rational site selection process in this project.

Initial base maps with overlays were developed for Kasserine Governorate in Central Tunisia in 1980-1981 by the CTDA with assistance from the University of Wisconsin. These maps, unfortunately, have not been maintained. In the intervening years, an additional approximately 40 public water systems and an approximately 2,600 private surface wells have been installed in the area. In addition, the GOT and AID have determined that the proposed project should also work in the Gafsa Governorate delegations of North Gafsa and Sened, about which little information is currently available on a spatially arranged basis. In order to maximize investment in public water supply, it is essential to have up-to-date maps relating these existing water resources to populations.

Resources available include the 1980-81 maps, 1974 aerial photos on a 1:25,000 scale, and detailed hydrogeologic maps on a 1:50,000 scale. In addition, data from the 1984 Tunisian census is now available. Combining these secondary sources, and others as indicated, with field work, the contractor will prepare:

1) A map or series of maps of Population Density which would show the actual distribution of population to the maximum degree possible. The map or series of maps should include sufficient physical features to relate this distribution to location. In addition, significant man-made landmarks (mosques, schools, roads, clinics, etc.) should be included.

2. A map or series of maps of Existing Water Resources which would show the actual location of water points of all types, including irrigation systems and oueds. The map(s) would classify such water points by type, year-round flow variation, and possibly by use.

These maps will be prepared for each of the 12 delegations in Kasserine and the 2 contiguous delegations of North Gafsa and Sened in Gafsa Governorate. The maps should be done on a large scale, at least 1:50,000 but preferably 1:20,000 or 1:25,000. The maps should be prepared so that overlays are possible.

Fieldwork envisioned to complement the secondary data is estimated to take 1 month per each of 12 rural delegations, plus less time in Kasserine Nord et Sud. Total study time would be six months.

Key Personnel

1. U.S. Study Administrator: This person will be associated with the Study for 6 months, resident in Tunisia. His/her main tasks would involve the administration and management of the study, including supervising staff, hiring and managing vehicles, arranging for and managing secretarial assistance, scheduling all fieldwork, and arranging for and managing final production of maps. S/he must be fluent in French and/or Arabic with preferably some knowledge of the other language. A PhD level in Geography is desired, with five years minimum professional experience in developing countries. The person must have demonstrated ability to work effectively with host country colleagues and with USAID.

2. U.S. Senior Advisor: This person must have a PhD in Geography or equivalent degree, at least 10 years professional experience in resource mapping and planning, and fluent French and/or Arabic. It is anticipated that this person would spend up to one month at the beginning and one month at the end of the study in Tunisia, assisting initially in the planning and research design and later in the analysis. This position could also be filled by two persons, one a social geographer and one natural resources specialist, depending on the mix of the rest of the study team.

3. Study Director (Tunisian): This person must have a Doctorat de Troisieme Cycle in Geography or an equivalent degree and would be responsible for all phases of the conduct of the study. S/he must have at least five years field experience in Tunisia or another developing country, experience in managing a research team, experience with resource mapping and cartography. Fluent French and Arabic is assumed, and some English would be preferable.

Other Personnel: Four person months Cartographer; 8 field workers for four months each, preferably with some experience in resource mapping; secretarial assistance.

Proposed Contracting Mode Options: The study is proposed to be undertaken through the SARSA Cooperative Agreement with the Institute for Development Anthropology (IDA) in collaboration with Clark University. Sub-contracting with a Tunisian institution or a group of individuals is required. IDA and Clark have extensive experience in similar work in Africa, notably in the Sudan and Kenya, and would bring this experience to bear on the work in Central Tunisia. A less costly alternative is to have CTDA contract directly with a Tunisian institution, or to have USAID contract directly with one. During the design, no existing firms or institutions could be discovered with the capability to mount such a quick and comprehensive exercise, particularly given the need for

vehicles, and financial and administrative backstopping (i.e. advancing the funds to cover work). It is strongly recommended that if USAID or CTDA are unable to discover a Tunisian institution that can mount the study in the time envisioned, and can demonstrate financial and administrative capabilities to do so, that it do so through SARSA. In addition to providing worldwide resources mapping experience and guidance, SARSA would be able to provide for the quick financial and administrative support the Tunisian field team would need.

DRAFT PRO FORMA BUDGET

Budget Item	\$	TD
1. U.S. Personnel		
- 6 pm Study Administrator.....	66,000	
- 2 pm Senior Advisor.....	22,000	
2. Tunisian Personnel		
- 6 pm Study Director.....	9,000	
- 4 pm Cartographer.....	6,000	
- 8 persons X 4 months Field Workers.....	32,000	
3. Travel and Transport		
- U.S. travel & per diem covered under No. 1 above in unit costs		
- 2 round trips U.S. consultation for Tunisian study director.....	5,000	
- Local transport		
2 Land Rovers and 2 other vehicles X 6 months rental plus POL and insurance.....	20,000	
- Per Diem (Tunisians) est. at TD 24/day, 1000 days.....	30,000	
4. Materials, reproduction, etc.....	25,000	20,000
	SUBTOTAL .....	118,000....117,000
	SUBTOTAL DOLLARS.....	284,140
5. 50 % Overhead .....	142,210	
	GRAND TOTAL.....	426,210
	ROUNDED TO.....	427,000

122

DRAFT SCOPE OF WORK

A & E CONTRACT

The objective of this contract is to improve the quantity and quality of civil works and equipping of rural potable water supply systems being installed through AID financing in Central Tunisia. Similar contracts have been executed with individuals and/or firms for similar work under the AID-funded CTRD Rural Health Project and an AID-funded housing program.

The contract will have five basic products/tasks:

- 1) Revision of standard designs for civil works with particular consideration of sanitation and drainage. Additional detail is found at Annex G of this PP, which should form an Annex to the IFB or RFP. This work is expected to take six person months (2 persons each at 3 months) at the beginning of the contract.
- 2) Adaptation of these standard designs to specific borehole sites will be undertaken throughout the life-of-the-project, and is estimated to take approximately 2 person months each year. The firm will survey well sites and, in consultation with the site Water User Association, determine the location for reservoirs, people water points, animal water points, drainage structures, etc. The firm will develop the specifications for each site in a form and substance suitable for inclusion in the CTDA IFB for construction contractors and equipment suppliers.
- 3) Design of up to 4 water system extensions for sites identified by CTDA, again in conformance with the details of Annex G, and in consultation with the local Water User Association. Preparation of detailed drawings and specifications suitable for inclusion in the CTDA IFBs for each site construction and equipment will be included. This work is estimated to take a total of 6 person months during the project.
- 4) Design of 2 house hook-up (New Mexico Model) systems based on sites and information obtained from CTDA. This work should also be carried out in collaboration with the Water User Association, and in conformance with the guidelines at Annex G. Preparation of drawings and specifications for each NMM suitable for inclusion in the IFBs drawn up by CTDA should be completed. This work is expected to take a total of 8 person months during years 2 and 3 of the project.
- 5) Construction monitoring will also be undertaken throughout the life-of-the-project, and is estimated to take a total of 3 person months each year. The contractor will make monthly site visits of all work under construction and will prepare monthly reports to AID and CTDA advising on the progress and problems to date and on measures recommended to mitigate against problems.

107

DRAFT PRO FORMA BUDGET

(TD 1000)

Item	86	87	88	89	90
<u>Personnel</u>					
1) Standard Design 2 p x 3 m x 1.5	9	-	-	-	-
2) Well Point Civil Works (total 27 estimated) 2 p x 1 m x 1.5 each year	3	3	3	3	3
3) Extensions (4) 3 p x 2 m x 1.5	-	6	3	3	-
4) NMM (2) 2 p x 3 m x 1.5 1 p x 2 m x 1.5	-	9	3	-	-
5) Monthly Monitoring 1 p X 3 m x 1.5 (1/2 only first year)	2.2	4.5	4.5	4.5	4.5
<u>Transport</u>					
1) Land Rover or equivalent rental and POL	3	3	3	3	3
2) Per Diem	1.5	1.5	1.5	1.5	1.5
<u>Materials</u>	1.5	1.5	1.5	1.5	1.5
TOTALS	20.2	27.5	18.5	15.5	12.5
(US \$000)	29	39	26	22	18

184

ATTACHMENT K-4: TRAINING

The budget provides for two types of training, each of which is summarized below.

1) In-Country Training: Up to 30 person months of Tunisian technical assistance is planned to provide the Unite d'Autogestion and other services, as needed, with training assistance. It is expected that this assistance will be defined by the Unite each year in consultation with the Local Organizations Consultant as annual plans are made. Trainers will be needed for the Unite, for the Local Committees, and for the officers of the Water User Associations. Skills that the trainers would have include: bookkeeping and accounting; basic mechanics; survey methodology; communications; community development; Tunisian civics; public health; vegetable gardening; and others. By the end of the Project at least three persons (presiding member, treasurer, guardian-pumpist) of each Association will have received skills training on a regular basis.

2) Short-Term Non-Academic Participant Training: Funds are provided in the budget for 48 person months (12 months each of 1987, 1988, 1989, 1990) of short-term non-academic training. This training is primarily for persons from the Unite d'Autogestion and the Regional and Local Potable Water Committees. This training will be based on recommendations made by the Local Organizations and Health Training Consultants on an annual basis, and is expected to include study-observation tours to Egypt, Morocco and Senegal to provide trainees with experience in local participation in resource management. A limited amount of this training may be used for AHA and other technical personnel for the CEFIGRE training in France; from brochures, the training appears geared towards executives of a senior level. Short-term study tours, as the Mission has found with the New Mexico trips, can have extremely high value at a relatively low cost. In order for this value to be maximized, they must be well planned.

185

ANNEX L

LIST OF PERSONS CONTACTED

USAID/Tunis

James R. Phippard, Director  
Mark Karns, Project Development Officer  
William Egan, Rural Development Officer  
Chedli ZARG EL AYOUN, Agriculture/Rural Development Office  
Mohamed Ali HASSAIRI, Project Development Office  
Mohamed Salah MAHJOUB, Agriculture/Rural Development Office  
James Vermillion, Advisor, Health, Population and Nutrition  
Tibor Nagy, Regional Engineer

AID/Washington

Mr. Charles Shorter, ANE/PD  
Ms. Jane Nandy, ANE/TECH/ARD  
Dr. Raymond Isely, Water & Sanitation for Health (WASH) Project

GOT Ministry of Agriculture/Tunis

Mohamed JAOUA, Directeur du Développement Rural, Direction du  
Génie Rural (GR)  
M. SARDOUK, Développement Rural, Direction du Génie Rural (GR)  
M. BOUSALEM, Régie de Sondage Hydraulique (RSH)  
M. BATTI, Direction des Ressources en Eau (DRE)  
M. MISSAOUI, DRE

Tunis

M. Khemais ALOUINI, Direction du Génie Rural, Tunis  
M. MARZOUK, SONEDE/Tunis  
M. Moncef KHEZAMI, SONEDE/Tunis  
Dr. Mohammed FAKHFAKH, Geographer, Tunis  
Dr. Alya BAFFOUN, Professor of Social Psychology, Tunis  
Dr. Abdelkader ZGHAL, Sociologist, Tunis  
Dr. Lilia BEN SALEM, Sociologist, University of Tunis

Central Tunisia

M. Mohamed MEKKI, Governor, Kasserine  
M. Ridha FEKIH, Président Directeur Général (PDG), Office de  
Développement de la Tunisie Centrale (ODTC), Ministère de  
l'Agriculture  
M. Mosbah HAJJI, Directeur, Aménagement Hydro-Agricole (AHA),  
CTDA  
M. Moncef HOSSEIN, Responsable de Project d'Eau Potable,  
AHA/CTDA

M. Mohsen TURKI, Consultant, CTDA  
M. Lamine RAHMOUNI, Assistant Engineer, AHA/CTDA  
M. Moncef HAMDY, Technician, AHA/CTDA  
M. Bashir NAIJA, Senior Planning Advisor, CTDA  
M. Mohammed SAKRI, Director, Planning and Evaluation, CTDA  
M. Hattab BEN CHAABANE, Geographer, CTDA  
M. HASSENET, Direction of Administration and Finance, CTDA  
M. MISSAOUI, Direction of Administration and Finance, CTDA  
M. Robert Smith, Oregon State University Team, CTDA  
M. Bill Grealish, Oregon State University Team, CTDA  
M. Abdelmalek MENASRI, CTDA/Sbeitla  
M. Dalhoumi TOUHAMI, CTDA  
M. Hamdene RAHOUY, Commissaire General, Commissariat Regional de  
Developpement Agricole (CRDA), Kasserine  
M. LABIDI, Directeur de Genie Rural, CRDA/Kasserine  
M. Abdallah RIDAH, Directeur de DRES, CRDA/Kasserine  
M. Larbi HAMZAOUY, Directeur Regional de la Sante, Kasserine  
M. Amman M'RAIHI, Educateur Sanitaire Regional, Kasserine  
M. Abdulaziz TLILI, Directeur Regional de l'Action Sociale  
(Affaires Sociales) et le Maire, Kasserine  
M. Mohamed BHOURI, Directeur Regional de la Societe Nationale d'  
Exploitation et de Distribution des Eaux (SONEDE), Kasserine  
M. MORGANE, SONEDE  
M. Ali BELAZREG, Directeur Régional de l'Education National  
M. Mohamed Hedi JERIDI, Directeur Régional du Programme de  
Developpement Rural (PDR), le Gouvernorat, Kasserine  
M. NIJAOUY, PDR/Kasserine  
M. Mondher NEJI, Fonds du Développement Communautaire (FDC),  
Kasserine (Tunisian name for Save the Children U.S.A.)  
M. Hassine BACHA, Private Entrepreneur and President of Kasserine  
Young Chamber of Commerce  
M. HAMDA, General Manager, Banque National de Tunisie, Kasserine  
M. BECHIR, Deputy Postmaster, Sbeitla  
M. Ali AJLUNI, CTDA Office, Sbeitla  
M. Mustafa ABIDI, CTDA Office, Feriana  
Many Citizens of Kasserine Governorate  
Dr. Muneera Salem-Murdock, Institute for Development  
Anthropology  
Dr. Susan Davis, Institute for Development Anthropology  
Ms. Tamara Salem Murdock, Institute for Development Anthropology

137

ANNEX M

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Eau, Fevrier 1975

ANNEX N

LIST OF ACRONYMS

AC	Asbestos Cement
A+E	Architectural and Engineering
AHA	Aménagement Hydro-Agricole
AIC	Association d'Intérêt Collectif
BNT	Banque Nationale de Tunisie
CEFIGRE	Centre de Formation International à la Gestion des Ressources en Eau
CONT	Contractor
CRDA	Commissariat Regional de Développement Agricole
CTDA	Central Tunisia Development Authority
CTRD	Central Tunisia Rural Development Program
DAAF	Departement des Affaires Administratives et Financières (CTDA)
DRE	Direction des Ressources en Eau/Kasserine
DRES	Direction des Ressources en Eau et en Sols
FADES	Arab Fund for Development
FAR	Fixed Amount Reimbursement
GIH	Groupement d'Intérêt Hydraulique
GR	Génie Rural
HP	Horse Power
IBRD	International Bank for Reconstruction and Development
IDA	Institute for Development Anthropology
IFD	Invitation for Bid
IR	Ingersoll-Rand
KFW	German Development Bank
LC	Local Cost
l/s	litres/second
NMM	New Mexico Model
O+M	Operations and Maintenance
PDG	President Directeur General
PDR	Programme de Développement Rural
PDRI	Programme de Développement Rural Intégré
POL	Petroleum, Oil and Lubricant
PPI	Public Irrigated Perimeters
PTT	Poste Téléphone Télégraphe
PVC	Polyvinyl Chloride
RSH	Régie des Sondages Hydrauliques
SARSA	Cooperative Agreement for IDA
SCF/CDF	Save the Children Federation/Community Development Foundation
SIDA	Swedish International Development Agency
SONEDE	Société Nationale d'Exploitation et de Développement des Eaux
TDH	Total Dynamic Head
UAG	Unité d'Auto Gestion
WUA	Water Users Association

ANNEX O

Concurrent Expenditures by Source/Calendar Year

A comment is offered regarding the seeming lack of a Tunisian contribution for either category 2., "Construction", or 4. "Training". The GOT will in fact finance the pumpsets essential for the construction of functional water systems, but this contribution has been included under category 3., "Commodities". The GOT will also contribute significantly to incountry training, but its inputs are included in categories 1 and 3, for provision of training staff and training materials.

10/2

TABLE O-1: SUMMARY BUDGET  
(US \$'000)

	<u>AID</u>	<u>GOT and Other</u>
1. Personnel and Technical Assistance	1162	795
2. Construction	3967	-
3. Commodities	369	611
4. Training	189	187
5. Other - GOT contribution	-	200
- WUA contribution		920
Evaluation/audit	232	-
Inflation/contingency	581	677
Totals	<u>6,500</u>	<u>3,390</u>
GRAND TOTAL	<u>\$9,890</u>	

103

TABLE O-2: CONCURRENT EXPENDITURES BY SOURCE BY CALENDAR YEAR (\$'000)

Date, Source, Type Component	1986		1987				1988				1989				1990				Total						
	AID FX	TUN LC	AID FX	TUN LC	AID FX	TUN LC	AID FX	TUN LC																	
<u>Technology Transfer</u>	631	614	51	95	69	1139	107	106	47	1506	131	119	23	747	138	133	23	510	145	150	793	4516	572	603	
1. Personnel and TA	427	29	-	75	44	39	-	75	22	30	-	75	-	22	-	75	-	18	-	75	493	138	-	375	
2. Construction	-	561	-	-	-	1046	-	-	-	1335	-	-	-	623	-	-	-	402	-	-	-	3967	-	-	
3. Commodities	181	24	51	-	-	-	102	-	-	-	119	-	-	-	119	-	-	-	119	-	181	24	510	-	
5. Other	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	100	
Inflation/Contin.	23	-	-	-	25	54	5	11	25	141	12	24	23	102	19	38	23	90	26	55	119	387	62	128	
<u>Institutional Dev: Local</u>	-	-	-	144	-	-	-	183	-	-	-	231	-	-	-	287	-	-	-	353	-	-	-	1198	
5. Other (WUA input)	-	-	-	144	-	-	-	164	-	-	-	184	-	-	-	204	-	-	-	224	-	-	-	920	
Inflation	-	-	-	-	-	-	-	19	-	-	-	47	-	-	-	83	-	-	-	129	-	-	-	278	
<u>Institutional Dev: Reg.</u>	131	151	18	121	282	58	57	124	152	41	63	140	261	22	69	156	70	23	50	219	896	295	257	760	
1. Personnel and TA	131	27	-	60	218	45	-	90	87	27	-	90	188	9	-	90	22	9	-	90	646	117	-	420	
3. Commodities	-	124	18	41	-	10	-	1	-	10	-	2	-	10	-	1	-	10	-	38	-	164	18	83	
4. Training	-	-	-	-	51	-	51	-	51	-	51	-	51	-	51	-	36	-	34	-	189	-	187		
5. Other	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	100	
Inflation	-	-	-	-	13	3	6	13	14	4	12	28	22	3	18	45	12	4	16	71	61	14	52	157	
<u>Total Components</u>	762	765	69	360	351	1197	164	413	199	1547	194	490	284	769	207	576	93	533	195	722	1689	4811	829	2561	
																			Project Totals			6,500		3,390	
																			Grand Total			9,890			

Footnotes for Tables O-2, 3, 4:

1. Calendar year is used as it coincides with the GOT annual planning and budgeting cycle. No difference is assumed for US FY.
2. Exchange Rate: TD .700 = \$ 1.00 US LOP
3. Inflation Rate: US and FX = 5% Compounded  
TD = 12% compounded

TABLE O-3: DETAIL OF CONCURRENT EXPENDITURES BY CALENDAR YEAR: TECHNOLOGY TRANSFER  
(\$'000)

Date, Source, Type Component	1986		1987		1988		1989		1990		Total													
	AID FX	TUN LC FX	AID LC FX	TUN LC FX	LC																			
<u>Technology Transfer</u>																								
1. <u>Personnel and TA</u>	427	29	-	75	44	39	-	75	22	30	-	75	-	22	-	75	-	18	-	75	493	138	-	375
. US TA: s-t x 6 pm (4 pm "e" log; 2 pm other)	-	-	-	44	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	66	-	-	-	
. Tun. TA: S-t x 2 pm (1pm PVC casing, 1 pm PVC pipe)	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	4	-	-
. Tunisian A&E firm	-	29	-	-	-	39	-	-	-	26	-	-	-	22	-	-	-	18	-	-	-	134	-	-
. Water Resources Mapping Contract (US)	427	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	427	-	-	-
. GOT Staff																								
- AHA	-	-	-	45	-	-	-	45	-	-	-	-	45	-	-	-	-	45	-	-	-	-	-	225
- Other tech. serv.	-	-	-	30	-	-	-	30	-	-	-	-	30	-	-	-	-	30	-	-	-	-	-	150
2. <u>Construction</u>	-	561	-	-	-	1046	-	-	-	1335	-	-	-	623	-	-	-	402	-	-	-	3967	-	-
. Wells	-	432	-	-	-	647	-	-	-	540	-	-	-	-	-	-	-	-	-	-	-	1619	-	-
. Civil Works	-	129	-	-	-	258	-	-	-	301	-	-	-	301	-	-	-	301	-	-	-	1290	-	-
. Extensions	-	-	-	-	-	141	-	-	-	304	-	-	-	132	-	-	-	101	-	-	-	678	-	-
. NMM	-	-	-	-	-	-	-	-	-	190	-	-	-	190	-	-	-	-	-	-	-	380	-	-
3. <u>Commodities</u>	181	24	51	-	-	-	102	-	-	-	119	-	-	-	119	-	-	-	119	-	181	24	510	-
. Research equipment	181	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	181	-	-	-
. Vehicles	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	-	-
. Pump set	-	-	51	-	-	-	102	-	-	-	119	-	-	-	119	-	-	-	119	-	-	-	510	-
5. <u>Other: (POL Taxes)</u>	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	100
Sub-Total	608	614	51	95	44	1085	102	95	22	1365	119	95	-	645	119	95	-	420	119	95	674	4129	510	475
Inflation 5% or 12%/ Contingency	23	-	-	-	25	54	5	11	25	141	12	24	23	102	19	38	23	90	26	55	119	387	62	128
Component Total	631	614	51	95	69	1139	107	106	47	1506	131	119	23	747	138	133	23	510	145	150	793	4516	572	603

TABLE O-4: DETAIL OF CONCURRENT EXPENDITURES BY CALENDAR YEAR: INSTITUTIONAL DEVELOPMENT  
(\$'000)

Date, Source, Type Component	1986			1987			1988			1989			1990			Total								
	AID		TUN	AID		TUN	AID		TUN	AID		TUN	AID		TUN	AID		TUN						
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC						
<u>Institutional Dev: Local</u>																								
5. Other	-	-	-	144	-	-	-	164	-	-	-	184	-	-	-	204	-	-	-	224	-	-	-	920
O + M for water system (WUA)	-	-	-	144	-	-	-	164	-	-	-	184	-	-	-	204	-	-	-	224	-	-	-	920
<u>Institutional Dev: Region</u>																								
1. Personnel & TA	131	27	-	60	218	45	-	90	87	27	-	90	188	9	-	90	22	9	-	90	646	117	-	420
US L-T 2 py maintenance	65	-	-	-	130	-	-	-	65	-	-	-	-	-	-	-	-	-	-	-	260	-	-	-
. 6 pm local orgs	22	-	-	-	11	-	-	-	11	-	-	-	11	-	-	-	11	-	-	-	66	-	-	-
. 6 pm Health Trn	22	-	-	-	11	-	-	-	11	-	-	-	11	-	-	-	11	-	-	-	66	-	-	-
. 2 pm Spatial Anal. (Criteria)	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	-	-
Evaluation/Audit (6 pm x 2 eval., 3 pm x 1 audit)	-	-	-	-	66	-	-	-	-	-	-	-	166	-	-	-	-	-	-	-	232	-	-	-
. TUN L-T 2 py maint.	-	18	-	-	-	36	-	-	-	18	-	-	-	-	-	-	-	-	-	-	-	72	-	-
. TUN S-T Research &/or Training UAG's (30 pm)	-	9	-	-	-	9	-	-	-	9	-	-	-	9	-	-	-	9	-	-	-	45	-	-
. GOT Staff	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
. UAG	-	-	-	30	-	-	-	60	-	-	-	60	-	-	-	60	-	-	-	60	-	-	-	270
. Other	-	-	-	30	-	-	-	30	-	-	-	30	-	-	-	30	-	-	-	30	-	-	-	150
3. Commodities	-	124	18	41	-	10	-	1	-	10	-	2	-	10	-	1	-	10	-	38	-	164	18	83
. UAG Equipment	-	-	-	17	-	-	-	1	-	-	-	2	-	-	-	1	-	-	-	2	-	-	-	23
. Training Materials	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Health Education	-	100	-	-	-	10	-	-	-	10	-	-	-	10	-	-	-	10	-	-	-	140	-	-
. Vehicles	-	24	18	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36	-	24	18	60
4. Training	-	-	-	-	51	-	51	-	51	-	51	-	51	-	51	-	36	-	34	-	189	-	187	-
. US or 3rd count S-T x 63 pm	-	-	-	-	51	-	51	-	51	-	51	-	51	-	51	-	36	-	34	-	189	-	187	-
5. Other: POL and Taxes	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	20	-	-	-	100
Sub-Total	131	151	18	121	269	55	-	111	138	37	-	112	239	19	51	111	58	19	34	148	835	281	205	603
Inflation	-	-	-	-	13	3	6	13	14	4	12	28	22	3	18	45	12	4	16	71	61	14	52	157
Component Total	131	151	18	121	282	58	57	124	152	41	63	140	261	22	69	156	70	23	50	219	896	295	257	760

ANNEX P. STATUTORY CHECKLIST

1. COUNTRY CHECKLIST

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481; FY 1986 Continuing No

Resolution. Has it been determined or certified to the Congress by the President that the government of recipient country has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971) which are cultivated produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country to United States government personnel or their dependents or from entering the United States unlawfully?

2. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government? No

3. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? No

4. FAA Sec. 620(a), 620(f), 620D; FY 1985 Continuing Resolution Secs. 512 and 513. Is recipient country a Communist country? Will assistance be provided to No

1987

Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq or South Yemen? Will assistance be provided to Afghanistan or Mozambique without a waiver?

5. FAA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U. S. property? No
6. FAA Sec. 620(l). Has the country failed to enter into an agreement with OPIC? No
7. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized or imposed any penalty or sanction against, any U.S. fishing activities in international waters? (b) If so, has any deduction N/A required by the Fishermen's Protective Act been made? No
8. FAA Sec. 620(q); FY 1986 Continuing Resolution Sec. 518. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any A.I.D. loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds? No
9. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? Yes  
(Reference may be made to the annual "Taking into Consideration" memo: "Yes taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)  
Taken into account by the Administrator at time of approval of Agency OYB.

198

10. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? No
11. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget? (Reference may be made to the Taking into Consideration memo.) Current
12. FAA Sec. 620A; FY 1986 Continuing Resolution Sec. 521. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime? No
13. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA? No
14. FAA Sec. 669, 670. Has the country after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials or technology without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.) No
15. ISDCA of 1981 Sec. 720. Was the No

176

country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Session of the General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.)

16. FY 1986 Continuing Resolution. If assistance is from population functional account, does the country (or organization) include as a part of its population planning program involuntary abortion? N/A

17. FY 1986 Continuing Resolution Sec. 530. No  
Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States?

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria

FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? N/A

2. Economic Support Fund Country Criteria

a. FAA Sec. 502B. No  
Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvements in its human rights record that furnishing such assistance is in the national interest?

2. PROJECT CHECKLIST

A. GENERAL CRITERIA FOR PROJECT

1. FY 1986 Continuing Resolution Sec. 525; FAA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that amount)?

Congressional Notification

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

a. Yes  
b. Yes

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

N/A

4. FAA Sec. 611(b); FY 1986 Continuing Resolution Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973, or the Water Resources Planning Act (42 U.S.C. 1962, et seq.)? (See A.I.D. Handbook 3 for new guidelines.)

Yes for applicable portions

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?

N/A

201

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. No. Project will develop water resources in a geographically circumscribed area.
7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. Where appropriate, private sector participation is incorporated
8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). US contractor support for Water Resources Survey and for TA will be obtained
9. FAA Sec. 612(b), 636(h); FY 1986 Continuing Resolution Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars. Yearly Reports of the GOT contribution will be required
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? No

10/1

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? Yes
12. FY 1986 Continuing Resolution Sec. 522. If assistance is for the production of any commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity? N/A
13. FAA 118(c) and (d). Does the project comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the project or program take into consideration the problem of the destruction of tropical forests? Yes
14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditure of project funds (dollars or local currency generated therefrom)? N/A
15. FY 1986 Continuing Resolution Sec. 536 Is disbursement of the assistance conditional solely on the basis of the policies of any multilateral institution? No

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

- a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and ensuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical N/A

263

assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

- b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used? N/A
- c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)? N/A
- d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)? N/A
- e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (M.O. 1232.1 defined a capital project as the "construction", expansion, equipping or alteration of a physical facility or facilities financed by A.I.D. dollar assistance of not less than \$100,000, including related advisory, managerial and training services, and not undertaken as part of a project of a predominantly technical assistance character.) N/A

204

f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth? N/A

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country, utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government. N/A

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest. N/A

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan? N/A

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of FAA Section 102? Yes

b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities? No

c. FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives? No

205

d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

N/A

ANNEX Q

SUBJECT: Waiver of Source/Origin for the Rural Potable Water Institutions Project (664-0337) for Tunisia

ISSUE: The implementation of the subject project requires the procurement of vehicles of non-U.S. manufacture. In order to allow such procurement, the following waivers are needed:

- (1) a source/origin waiver from Geographic Code 000 (U.S. only) to Code 935 (Special Free World); and
- (2) a waiver of provisions of section 636(i) of the FAA.

AUTHORITY: Delegation of Authority 113.3A delegates authority to waive source and origin for motor vehicles up to \$50,000, exclusive of transportation cost, to the USAID Director.

FACTS:

- (a) Cooperating Entity: Government of Tunisia
- (b) Authorizing Document: Project No. 664-0337
- (c) Project: Rural Potable Water Institutions
- (d) Nature of Funding: Grant
- (e) Description of Goods: 4 utility vehicles
- (f) Approximate Value: \$50,000
- (g) Probable Source: EEC or Tunisia
- (h) Probable Origin: EEC or Tunisia

DISCUSSION:

A. Source/Origin Waiver

In accordance with AID Handbook 1B, procurement of commodities from Code 935 source requires a waiver. Handbook 1, Supp. B, Chapter 5B 4a(7) states a waiver may be granted if there are "such other circumstances as are determined to be critical to the success of project." The success of the Rural Potable Water Institutions Project is dependent upon the provision of adequate transportation.

Furthermore, under Handbook 1, Supplement B.4.C.2.d(1)(b), the requirement that motor vehicles be manufactured in the United States can be waived when there is a "present or projected lack of adequate service facilities and supply of parts for U.S. manufactured vehicles."

There are currently no U.S.-manufactured vehicles being sold in Tunisia. In 1981 and 1982, A.I.D. financed the procurement of approximately 150 U.S.-manufactured Dodge Omnis for a variety of projects. Because of the size of the total order, the approximate 15% spare parts added to the order, and the concentration of those vehicles in the Tunis area, it was possible to develop a marginally-satisfactory maintenance capability. Outside of Tunis, maintenance of those vehicles was virtually non-existent. It is unlikely that an adequate parts supply or maintenance capability could be redeveloped in Tunisia for U.S. models given the relatively small number of U.S. vehicles in Tunisia. Furthermore, U.S. vehicles have proved to be only marginally satisfactory for rural extension activities. In most areas served by extension agents, U.S. made vehicles have simply proved to be inadequate for rough roads and tracks which must be traversed to effectively reach small farmers and remote water points. Low road clearance impedes the vehicles from travelling on eroded country roads, and rough road conditions have caused continued maintenance problems.

The vehicles proposed for financing under this Project would be of relatively simple design with high road clearance and would be serviceable throughout Tunisia. Peugeot and Landrover vehicles for example, are utilized throughout Tunisia by farmers, small businesses and government services. They have proved to be efficient and cost effective forms of transportation throughout Tunisia. Spare parts are available in small towns, and local mechanics are familiar with these vehicles and can maintain them with few problems.

USAID would welcome the opportunity to use U.S. source and origin motor vehicles in Tunisia in AID/GOT development projects. However, to do so without viable local dealer support for essential services and parts support is detrimental to the achievement of the Project's objectives and contrary to the best long term interests of the United States.

B. Waiver of Section 636(i)

In addition to the general source/origin limitations on the procurement of commodities, Section 636(i) of the FAA prohibits the procurement of vehicles of non-U.S. manufacture. However, the provisions of Section 636(i) may be waived when special circumstances permit it. Under Handbook 1, Supp. B, Chapter 4.C.2.d(1)(b), special circumstances are deemed to exist if there is "present or projected lack of adequate service facilities and supply of parts for U.S.-manufactured vehicles."

Since there is an inability to provide needed service and parts for U.S.-manufactured vehicles in Tunisia and this capability now exists only for vehicles of Code 935 origin, the special circumstances criterion set forth above is satisfied.

209

ANNEX R

Other Donor Activities

Rural Potable Water

German Development Bank (KFW)

The German Development Bank is involved in two types of activities. First is loans for the amelioration of potable water needs in rural areas of less than 500 persons. These activities will be focussed on disadvantaged areas, with highly dispersed populations.

Two loans at concessionary terms, totalling 55 million DM, have been provided for these areas. The first loan was provided in 1981 and is targeted at Southern and Central Tunisia. The second began the following year and is targeted at North and Northwest Tunisia. The counterpart agency of the GOT for these loans is Genie Rural (Ministry of Agriculture).

The second type of activity is loans for the purpose of ameliorating small and large potable water systems. Included will be some activities directed at provision of water points to locations where none currently exists. Two loans for this purpose were provided in 1980, one directed at the areas of Ghomrassen, Tatouine and Ras Djebel and the other at Southern Tunisia. These loans total 90 million DM and are also at concessionary terms. SONEDE is the counterpart agency for these loans.

The potable water activities of the German Development Bank are directed toward three goals: integrated rural development, stemming the rural exodus and making the rural populace self supporting.

World Bank-IBRD

The World Bank in 1985 made a loan in the amount of \$50 million for a seventh water supply project in Tunisia. A standard variable rate of interest is imposed. The period of project activities is 1985-1991.

The loan, to be administered through SONEDE, will fund potable water activities nationwide. These activities include installation of piped water supply systems in about 600 rural villages; provision of drilling, operating and maintenance

equipment; applied research related to new equipment and inexpensive materials for rural water systems, studies in the areas of finance and organizational structure, provision of credit mechanisms for homeowners to finance cost of installation in their homes; as well as a health education program. Low-income groups will be the primary beneficiaries of the project, including 350,000 persons. Forty percent of these would have a standpipe in their yards and sixty percent would benefit from public water points.

The goals of the activities under this loan are to extend public water services to a larger share of the rural population, to ensure adequate operation and maintenance of the village system and to build up SONEDE's capacity to provide services in rural areas.

#### UNICEF

In 1984, UNICEF began a 3 year project concerned with water supply and integrated development activities. This project, ongoing in the Governorate of Kairouan, has two sets of funding sources. The first centers on a FADES loan of \$2,300,000 at below market rates. A GOT contribution of approximately \$1.5 million TD is associated with this funding source and the counterpart agency is the Ministry of Agriculture. The second source is a grant from UNICEF of \$2.3 million with a GOT contribution of \$1.2 million TD. This is administered through the Governorate and PDR.

This project has a number of components. The largest financially are those concerned with the provision of wells (up to 250 wells) and the provision of water networks (19 systems). Maintenance activities are included to reinforce the maintenance structure; health education is a focus through work with mobile health teams, dispensaries, public schools, etc. Water quality is a focus through the sanitary improvement of existing equipped wells. Sanitation, nutrition and home gardening are also targets of project activities.

The policy goals of this project are:

1. to achieve gains in child survival and development through improvements in water supply and education about water use, health and nutrition and
2. to demonstrate the social, health and economic benefits of an integrated approach to water characterized by ample supplies produced by reliable water systems. With respect to the latter, the project intends to demonstrate for example that ample, clean water prevents illness, that

preventive health strategies are cheaper than curative procedures, and that a well-organized, effective maintenance program will be cheaper and more productive than the present maintenance system.

UNDP/WHO

In conjunction with WHO, UNDP is undertaking a series of design and planning activities leading to the development of a white paper for rural water supply and preparation of ensuing investment dossiers. In toto, \$330,000 will be supplied to this 2 year effort which began in 1985. The GOT contribution is 90,600 TD and the GOT counterpart is the Ministry of Health.

Two studies, one a socioeconomic and one an institutional study, will be carried out in the initial phases of the project. These studies will feed into the activity of formulating a national plan for rural water supply and sanitation with specification of options as to future courses of action. Selection of options for pilot testing will be made by the GOT. Results of these pilots will lead to preparation of a capital construction plan for the following 3 - 5 years and development of concomitant investment dossiers.

This project responds to national priorities of rural development, job creation and reduction of rural - urban inequities. Ultimate adoption of the national master plan would benefit rural populations by providing clean water supplies and sanitation facilities closer to dwellings, thus minimizing the risks of water borne disease and of insanitary disposal of excrement.

Attached is a tabular overview of other donor activity.

212

OVERVIEW OF OTHER DONOR ACTIVITIES IN POTABLE WATER

Donor	Description of Project (Counterpart)	Funding Level	Duration of Project	Type of Funding	Location	Policy Goals
German Development Bank (KFW)	Amelioration of potable water needs in areas of less than 500 persons (Génie Rurale)	25 million DM, repayable in 20 years w/ 5yr grace period (4.5% interest)	Started 1981	Loan	South and Central Tunisia	integrated rural development, to stem rural exodus, make rural populace self supporting
German Development Bank (KFW)	Amelioration of potable water needs in areas of less than 500 persons (Genie Rurale)	30 million DM, same terms	Started 1982	Loan	North and Northwest Tunisia	integrated rural development, to stem rural exodus, make rural populace self supporting
German Development Bank (KFW)	Amelioration of potable water (small and large systems) (SONEDE)	20 million DM, 30 years, 10 years grace, 2% interest	Started 1980	Loan	Ghomrassen Tataouine, Ras Djebel	integrated rural development, to stem rural exodus, make rural populace self supporting
German Development Bank (KFW)	Amelioration of potable water (small and large systems) (SONEDE)	70 million DM, 20 years, 5 years grace, 3.5% interest	Started 1980	Loan	Southern Tunisia	integrated rural development, to stem rural exodus, make rural populace self supporting
World Bank (IBRD)	Installation of piped water supply systems in about 600 rural villages, and att-	US \$50 million equivalent, repayable in 17 years with a 4 year	1985-91	Loan	Nationwide	to extend public water supply services to a larger share of the rural population; to

(Cont'd)

	tendant activities (SONEDE)	period of grace, standard variable interest rate, total project costs of \$104.4 million				ensure adequate operation and maintenance of the village systems; and to build up SONEDE's capacity to provide services in rural areas.
UNICEF	Installation of up to 250 small bore wells, 19 water systems, with maintenance, health education and other activities  (Financial Package 1- Ministry of Agriculture	Financial Package 1- \$2,300,000 FADES (below market terms) 1,500,000 TD GOT contribution approximate	1984-87	Loan	Governorate of Kairouan	to provide a demonstration model related to child survival and development benefits of a more productive, more reliable potable water system
	Financial Package 2- Governorate through PDR)	Financial Package \$2,300,000 UNICEF 1,200,000 TD GOT contribution	1984-87	Grant	Governorate of Kairouan	
UNDP/WHO	design and planning	\$250,000 UNDP	1985-87			

ANNEX S

Fixed Amount Reimbursement (FAR) Procedures

The FAR procedures described below were established under the Central Tunisia Rural Potable Water Subproject (664-0312.7) which preceded this Project. Under these procedures the Mission only reimburses the GOT for civil-works construction costs. The Mission will follow the same procedures under the Rural Potable Water Institutions Project for civil-works construction costs.

Once a well is tested positive, an IFB for civil-works construction is issued and, subsequently, a FAR is established to include negotiated and agreed upon construction costs. Reimbursements are calculated at the exchange rate at the time disbursements are made. Project implementation letters (PILs) establish FAR amounts for a specific number of water systems and constitute the FAR agreement. The agreed amounts become fixed at the time of such agreements. The GOT is responsible for any costs over the established amounts. Reimbursement of FAR amounts is made upon request by the GOT supported by CTDA's provisional acceptance of satisfactory completion of construction and final inspection by a USAID representative.

The Government's requests for reimbursement will be accompanied by its statement that the respective units of work have been completed in accordance with agreed designs. Upon receipt from the Government of notification that work units have been completed, a representative of AID will visit project sites for the purpose of final inspection. If AID determines that the work conforms to specifications, and if all applicable conditions precedent have been satisfied, the completed work will be certified for reimbursement. The documentation required to support the Government's request for reimbursement shall include the following, for each unit of work for which reimbursement is being requested:

1. Identification by location of the units for which reimbursement is being requested, and the amount being claimed for each unit,
2. Certification by the CTDA that each unit has been completed in accordance with the agreed specifications, and has been provisionally accepted from the contractor,

215

3. Copy of the notification to the contractor of the provisional acceptance of his work under the contract, and

4. Any other documents which AID may reasonably require.

Reimbursement for all drilling and casing costs is based on actual costs. We can not establish FAR amounts for drilling and casing prior to completion of drilling operations because we do not a priori know how deep each well will be. We only reimburse the actual cost of (1) meters drilled at both positive and negative sites and (2) casing materials installed in positive sites. Disbursements for civil-works construction costs (FAR) and disbursements for actual drilling and casing costs for a specific number of water systems are made in one U.S. dollar check. No disbursements are made for the cost of motor pumps, generators and related equipment including spare parts as these costs are included in the GOT contribution. However, a site will not become eligible for reimbursement before the well has been test pumped, the motor pump set installed and the water system operational. The basic requirement for reimbursement is satisfactory completion of construction of a water system in strict compliance with Mission approved plans and specifications. Costs relating to Tunisian taxes are not reimbursed.

The above procedures were set forth in PILs Nos. E-1, E-12, E-14, E-15, E-17 and E-20 under the 664-0312.7 Subproject.

216

ANNEX T

ACTION MEMORANDUM

TO : James R. Phippard, Director  
FROM: Mark Karns, Mission Environmental Coordinator  
SUBJECT: Environmental Determination  
PROJECT TITLE: Rural Potable Water Institutions  
PROJECT NUMBER: 664-0337

Problem: The Rural Potable Water Institutions Project will address needs in Central Tunisia for additional water sources for dispersed populations; for a decentralized, institutional approach to rural water source management, including user participation and user fees; and will help to make maximal use of available financing through improved site selection methods for water interventions. The environmental impact of this new project must be considered.

Authority: Where a project has little or no environmental impact, a negative determination may be granted. In a memo of May 20, 1985, ANE/ E/PD/ENV, Stephen F. Lintner delegated final environmental clearance to the Mission.

Discussion: A memo from the ANE Environmental Coordinator, dated May 20, 1985 raised certain environmental issues which have been addressed in the design of this project:

- a) The need to select, design and maintain sites to ensure that healthy and sanitary conditions prevail around water points;
- b) The need to monitor water resources in the project area to ensure that use of water does not draw down the water table; and
- c) The need to monitor whether flock sizes are increasing with water availability, to assure that rangelands are not overgrazed.

The paragraphs below briefly address each of these concerns.

27

### Site Selection, Design and Maintenance

Technical and institution building components of the project will address the site selection, design and maintenance concern. Site selection and design parameters call for siting water points where the various elements (well, human and animal watering points, etc) are all out of drainage influence of each other. With respect to site maintenance to prevent pooling of water around facilities, the water users associations, which are a central element of this project, will be responsible for assuring maintenance of healthy conditions. At CTDA, the Unité d'Autogestion, which will be created under the auspices of the project, will work with the associations with regard to standards and procedures for site maintenance. The Regional Directorate of Public Health will provide assistance and training to the associations in health and sanitation efforts.

### Water Resources Monitoring

The state of water resources in the Central Tunisia area has to be constantly monitored to ensure that use of water does not draw down the water table. The Tunisian Water and Soil Resources Directorate (DRES) is very careful in processing permits for the construction of new wells. The agency is responsible for issuing permits and maintaining a log on permits issued for all public and private wells, both bored and dug. All wells proposed in this project will be approved by the DRES.

### Size of Flocks

Of concern also is the likelihood that increasing the water supply will lead to an increase in the number of sheep and goats, thus putting pressure on pasture.

There are currently several constraints on the size of herds:

- a) availability of water, especially in the summer time;
- b) availability of pasture; and
- c) management issues and in particular the availability of family labor for herding.

At the moment, it appears that the dominant constraint on herd size is the availability of drinking water for sheep and goat

flocks. It does not appear that increased water availability will lead to deterioration of range land in the Central Tunisia area. Members of the Oregon State University team working on the CTRD Range Development Subproject were consulted during project development. Their feeling was that as long as herders are not migratory, then flock size will be calibrated to the availability of pasture through local herding management practices. The number of sheep may increase with more water; it will also increase with improved pasture due to higher rainfall, or to higher prices in the market. At the same time, degradation may occur for a number of reasons, of which absolute increase in flock size is only one. The Tunisian herder is following a definite strategy, in which an improvement of the availability of water would ease certain constraints, but it would not lead to a totally different herding strategy.

Nonetheless it is important for this project to ensure that its interventions are not leading to an increase in flock size beyond the ability of the pasture to sustain it. Officials at the Range Development Subproject have indicated a willingness to assist in monitoring changes in flock size. The Range Development Subproject is currently working at several sites in the zone to be covered by this project (Sbiba, Foussana, Hassi El Ferid), which should facilitate this cooperation.

Recommendation: That, based on the rationale provided in the Discussion, you concur that the Rural Potable Water Institutions Project will have little or no environmental impact, and therefore warrants a negative environmental determination.

Approved: \_\_\_\_\_

Disapproved: \_\_\_\_\_

Date: 3.27.76

Clearances: PROG/LMacary (Draft)  
RLA/AWilliams (Draft)

REPUBLIQUE TUNISIENNE  
MINISTERE  
DES  
AFFAIRES ETRANGERES

ACTION COPY		
TO	DUE	TAKEN
ARD	3/20	
N.A.N.		

GOT REQUEST

10 MARS 1986

TUNIS, le .....

*Received with 3/12/86*

N° NH/SL/84/1  
S.E.C.I.

Monsieur le Directeur de la Mission  
Spéciale de Coopération Economique  
et Technique en Tunisie

501045

**TRÈS URGENT**

O B J E T / Coopération Tuniso-Américaine

Fonds E.S.F. 1986 : Projet Eau potable en Tunisie Centrale

P.JOINTE / Une (1)

—§—

J'ai l'honneur de vous faire parvenir ci-joint, une requête pour la réalisation d'un nouveau projet d'eau potable en Tunisie Centrale dans le cadre de la Programmation des Fonds E.S.F. de l'année 1986.

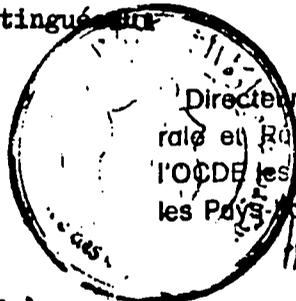
Ce projet consiste dans l'établissement et l'amélioration d'une approche institutionnelle décentralisée et coordonnée dans le domaine de la gestion et de l'entretien des points d'eau potable.

Le coût de ce projet s'élève à 6,5 Millions \$ US, dont 2,5 Millions \$ US seront réservés pour la région du SNED, et sera financé sur la dotation du Fonds de Soutien Economique de l'exercice fiscal 1986.

Veuillez agréer, Monsieur le Directeur, l'expression de ma considération distinguée.

**ALI TEKAIA**

Directeur de la Coopération Bilatérale et Régionale avec les Pays de l'OCDE, les Démocraties Populaires et les Pays Latino-Américains.



ACTION	INFO
<del>DIR</del>	
<del>ADJ</del>	
<del>EL</del>	
<del>HR</del>	
<del>INFO</del>	
<del>TR</del>	
<del>HR</del>	
<del>CON</del>	
<del>HR</del>	
<del>S &amp; T</del>	
<del>F &amp; A</del>	
<del>ARD</del>	
PHUD	
P. C.	
EMB/ADMIN	
EMB/GSO	
POL	
ECON	
C & R USAID	
CHRON	
RF	

*Attachment 1 copy to ARD  
original to CTR*

8

220

ANNEX V

Delegation of Authority

MAR 17 1936

221

ACT: AID-2 INFO: AMB DCM ECON 5

604 872.7

VZCZCTUO420  
PP RUEHTU  
DE RUEHC #4260 3432048  
ZNR UUUUU ZZH  
P 092045Z DEC 85  
FM SECSTATE WASHDC  
TO AMEMBASSY TUNIS PRIORITY 0906  
BT  
UNCLAS STATE 374260

10-DEC-85  
TOR: 08:20  
CN: 63109  
CHRG: AID  
DIST: AID

AIDAC

MAR 17 1986

E.O. 12356: N/A  
TAGS: N/A  
SUBJECT: TUNISIA - RURAL POTABLE WATER PROJECT

REFS: A) STATE 193291 B) TUNIS 10187

1. ANE HAS REVIEWED SUBSTANCE OF REF B IN LIGHT OF NEAC REVIEW CONTAINED IN REF A AND FINDS PROPOSED NEW PP APPROACH ACCEPTABLE ON ALL POINTS. IN FAC. MISSION IS TO BE COMMENDED CN INSTITUTIONAL DEVELOPMENT AND COST RECOVERY THROUGH USAGE FEES ASPECTS OF NEW PROJECT.

2. DUE TO INCREASED FUNDING LEVEL OF NEW PROJECT PROPOSAL (DOLS 6.5 MILLION VICE DOLS 2 MILLION ORIGINALLY PROPOSED), THIS CABLE ALSO PROVIDES FORMAL APPROVAL FOR NEW PROJECT AMOUNT.

3. UPON COMPLETION OF DESIGN, PLEASE CABLE TEXT FOR CONGRESSIONAL NOTIFICATION AND PROVIDE COPIES OF FULL PROJECT DOCUMENTATION TO AID/W. SHULTZ

BT  
#4260

NNNN

ACTION	INVO
DIR	<input checked="" type="checkbox"/>
A/DIR	<input checked="" type="checkbox"/>
EXO	<input checked="" type="checkbox"/>
FOR	<input checked="" type="checkbox"/>
PROG	<input checked="" type="checkbox"/>
TRG	<input checked="" type="checkbox"/>
PRE	<input checked="" type="checkbox"/>
CONT	<input checked="" type="checkbox"/>
HPN	<input checked="" type="checkbox"/>
S & T	<input checked="" type="checkbox"/>
F & A	<input checked="" type="checkbox"/>
JRD	<input checked="" type="checkbox"/>
RHUDO	<input checked="" type="checkbox"/>
P. C.	<input checked="" type="checkbox"/>
EMB/ADMIN	<input checked="" type="checkbox"/>
EMB/GSC	<input checked="" type="checkbox"/>
POL	<input checked="" type="checkbox"/>
ECON	<input checked="" type="checkbox"/>
C & R UNIT	<input checked="" type="checkbox"/>
CHRC	<input checked="" type="checkbox"/>
RF	<input checked="" type="checkbox"/>



4. GOT SUPPORT: THE NEAC AGREED THAT CENTRAL AND REGIONAL GOT SUPPORT IS CRUCIAL TO THE SUCCESS OF THE SUB-PROJECT. THE GOT SHOULD PROVIDE APPROPRIATE DOCUMENTATION DESCRIBING THE INSTITUTIONAL ARRANGEMENTS AND SUPPORT SYSTEM REQUIRED TO SUPPORT THE PROJECT AND SUSTAIN ACTIVITY AFTER AID ASSISTANCE HAS TERMINATED. THIS MIGHT INCLUDE A NEW INTERDEPARTMENTAL OR REGIONAL SERVICE, IF CREATED, OR EXISTING GOT GOVERNMENTAL UNITS SUCH AS SONEDE OR THE MOBILE MAINTENANCE TEAMS. IT WAS AGREED THAT THE ADEQUACY OF GOT SUPPORT IS DIFFICULT TO DETERMINE AT THIS TIME, AND THAT THE ADEQUACY WILL BE LEFT TO THE MISSION'S JUDGMENT AS NEGOTIATIONS CONTINUE WITH THE GOT AND THE PP DESIGN TEAM'S INVESTIGATION ENSUE.

5. LOCAL LEADERSHIP: THE NEAC AGREED THAT COMPETENT LOCAL LEADERSHIP IS AN IMPORTANT ELEMENT TO THE PROJECT'S SUCCESS. ADDITIONALLY, USER ASSOCIATIONS MUST HAVE COMPETENT LEADERS. THE PP SHOULD CONTAIN A STRATEGY FOR DEVELOPING LEADERSHIP CAPABILITY AT ALL LEVELS, INCLUDING PLANS FOR TRAINING AND EDUCATION, BUT PARTICULARLY AT THE LOCAL LEVELS.

6. PP DESIGN - THE NEAC THOUGHT THAT, IN LIGHT OF THE CRITICAL ROLE SOCIOCULTURAL FACTORS WILL PLAY IN DESIGNING SITE-SPECIFIC TECHNICAL AS WELL AS ORGANIZATIONAL SOLUTIONS, THE INSTITUTE FOR DEVELOPMENT ANTHROPOLOGY (IDA), WITH ITS APPLIED SOCIAL SCIENCE SKILLS AND TUNISIA EXPERIENCE, WAS AN APPROPRIATE LEAD ORGANIZATION FOR PP DESIGN. HOWEVER, IT WAS FELT APPROPRIATE TO HIGHLIGHT THE NECESSITY FOR THE PROJECT DESIGN TEAM TO DRAW UPON THE GROWING WORLDWIDE EXPERIENCE

IN SUCCESSFUL AND UNSUCCESSFUL TECHNOLOGICAL ASPECTS OF SMALL WATER SYSTEMS DESIGN, OPERATIONS AND MAINTENANCE, RECOVERY OF ORIGINAL AND RECURRING COSTS, AND THE CREATION OF WATER USER ASSOCIATIONS. IN THIS REGARDS, THE NEAC AND MISSION DIRECTOR CONCURRED IN THE PROPOSAL THAT THE WASH PROJECT, WITH ITS LARGE ARRAY OF PERTINENT TECHNICAL SKILLS, COULD SUPPLEMENT IDA'S SOCIOLOGICAL SKILLS AND THEREBY STRENGTHEN THE DESIGN TEAM. AS AN INITIAL EFFORT, IT WAS DECIDED THAT AID/W SHOULD ARRANGE AN IN-DEPTH EXCHANGE OF IDEAS AND INFORMATION BETWEEN IDA AND WASH DURING A WASHINGTON, D.C., TDY OF IDA TEAM MEMBERS.

7. CONDITIONS PRECEDENT: THE NEAC AGREED THAT IT IS PREMATURE AT THIS TIME TO SOLIDIFY APPROPRIATE CP'S GIVEN THE NEW AREAS BEING EXPLORED BY THIS SUB-PROJECT AMENDMENT.

8. AMENDMENT OR NEW PROJECT: THE NEAC DISCUSSED WHETHER

IT IS MORE APPROPRIATE TO AMEND THE EXISTING SUB-PROJECT OR CREATE A NEW PROJECT. ALTHOUGH THERE ARE MERITS TO EITHER APPROACH, THE NEAC ACCEPTED THE MISSION'S PROPOSAL TO AMEND THE EXISTING PROJECT AS THE MOST EFFICIENT WAY TO ACHIEVE PROJECT GOAL AND PURPOSE.

S. OTHER DISCUSSION POINTS/CONCERNS:

(A) GIVEN THE PROJECT'S COMPLEXITY, THE PP SHOULD INCLUDE LEAST COST CONSTRUCTION PLANS, COST BENEFIT ANALYSES, INTERNAL RATE OF RETURN PROJECTIONS, AND FINANCIAL ANALYSES (INCLUDING BOTH IN-KIND AND MONETARY CONTRIBUTIONS) WHICH WILL ADEQUATELY SUPPORT THE PROJECT. SUCH PLANS AND COST ESTIMATES SHOULD BE SUFFICIENT TO SATISFY FAA SECTION 611 (A).

(B) THE PROJECT SHOULD UNDERTAKE IN ITS SOCIAL SOUNDNESS ANALYSIS A STUDY OF THE PROJECTED BENEFITS THAT WILL ACCRUE TO USERS THROUGH THE PROPOSED SYSTEM OF ASSOCIATIONS AND ASSESS THE IMPACT OF THE NEWLY CREATED REGIONAL OR INTERDEPARTMENTAL SERVICE THAT WILL SUPPORT PROJECT ACTIVITIES.

(C) THE CABLE PID DID NOT MENTION HOW THE EVALUATION PLAN AND BUDGET FOR THE PP WILL BE HANDLED. THIS SHOULD BE A TASK FOR THE PP DESIGN TEAM.

(D) THE AMENDED PP DESIGN SHOULD ADDRESS THE ENVIRONMENTAL CONCERNS IDENTIFIED IN THE ORIGINAL PP AS OUTLINED BY ANE/NE/PD/ENV, STEPHEN LINTNER IN MEMO DATED

APRIL 10, 1980 TO PATRICK DEMOGECT. THE MISSION AND THE PP DESIGN TEAM SHOULD REVIEW ITS CONTENTS AND ADDRESS THE CONCERNS RAISED IN THE PP. FINAL ENVIRONMENTAL CLEARANCE OF THE PP AMENDMENT IS DELEGATED TO THE MISSION ENVIRONMENTAL OFFICER. COPIES OF THE FINAL ENVIRONMENTAL CLEARANCE MEMO SHOULD BE SENT TO AID/W, ANE/NE/PD/ENV, STEPHEN LINTNER.

10. MISSION IS COMMENDED ON ITS UNDERSTANDING AND TREATMENT OF COST RECOVERY AND O AND M ISSUES. SHULTZ

BT  
#3291

NNNN

ANNEX W

Congressional Notification

UNCLASSIFIED

TUNIS 116

VZCZCTUI \*  
RR RUEHC  
DE RUEHTU #0116/01 006 \*\*  
ZNR UUUUU ZZH  
R 061739Z JAN 86  
FM AMEMBASSY TUNIS  
TO SECSTATE WASHDC 2993  
BT  
UNCLAS SECTION 01 OF \* TUNIS 00116

*664-0337*  
*664-0337*  
*664-0337*  
CLASS: UNCLASSIFIED  
CHRG: AID 12/27/85  
APPRV: DIR:JRPHIPPARD  
DRFTD: PROG:MABASSI:LBB  
CLEAR: 1.PROG:LFMACARY  
2. RD:WEGAN  
3. PSC:JSMITH  
DISTR: AID-1

AIDAC

E.O. 12356: N/A  
SUBJECT: RURAL POTABLE WATER INSTITUTIONS (664-0337)  
CONGRESSIONAL NOTIFICATION

REF: 85 STATE 374260

1. BELOW IS TEXT OF (A) ADVICE OF PROGRAM CHANGE AND  
(B) ACTIVITY DATA SHEET FOR SUBJECT PROJECT AS REQUESTED  
PARA 3 REFTEL.

QUOTE:

A. AGENCY FOR INTERNATIONAL DEVELOPMENT  
- ADVICE OF PROGRAM CHANGE:

1. DATE:
2. COUNTRY: TUNISIA
3. PROJECT TITLE: RURAL POTABLE WATER INSTITUTIONS
4. PROJECT NUMBER: 664-0337
5. FY 1986 CP REFERENCE: PAGE 157
6. APPROPRIATION CATEGORY: ECONOMIC SUPPORT FUND
7. LIFE-OF-PROJECT FUNDING: DOLLARS 6,500,000
8. INTENDED FY-86 OBLIGATION: DOLLARS 6,500,000 (ESF GRANT)
9. THIS IS TO ADVISE THAT A.I.D. INTENDS TO OBLIGATE DOLLARS 6,500,000 IN FY-86 FOR A GRANT TO THE RURAL POTABLE WATER INSTITUTIONS PROJECT IN TUNISIA. THIS IS A NEW PROJECT AND WAS NOT INCLUDED PER SE IN THE FY-86 CONGRESSIONAL PRESENTATION BECAUSE AT THE TIME OF CP PREPARATION AID WAS ONLY CONSIDERING A SIMPLE EXTENTION OF AN EXISTING PROGRAM. THIS NEW BILATERAL PROJECT BUILDS UPON THE USAID'S ONGOING POTABLE WATER PROJECT (664-0312.7) AND ADDRESSES THE NEED TO INSTITUTIONALIZE POTABLE WATER ACTIVITIES. THE PROJECT WILL FOCUS ON NEEDS IN CENTRAL TUNISIA FOR ADDITIONAL WATER SOURCES FOR DISPERSED POPULATIONS; FOR A DECENTRALIZED, INSTITUTIONAL APPROACH TO RURAL WATER SOURCE MANAGEMENT, INCLUDING USER PARTICIPATION AND USER FEES; AND WILL HELP TO MAKE MAXIMUM USE OF AVAILABLE FINANCING THROUGH IMPROVED SITE SELECTION METHODS FOR WATER INTERVENTIONS.

B. ACTIVITY DATA SHEET:

1. PROGRAM: TUNISIA
2. TITLE: RURAL POTABLE WATER INSTITUTIONS
3. NUMBER: 664-0337.GRANT, NEW PROJECT

ACTION	INFO
DIR	<input checked="" type="checkbox"/>
A/DIR	<input checked="" type="checkbox"/>
EXC	<input checked="" type="checkbox"/>
PER	<input checked="" type="checkbox"/>
PROG	<input checked="" type="checkbox"/>
TRG	<input checked="" type="checkbox"/>
PRE	<input checked="" type="checkbox"/>
CONT	<input checked="" type="checkbox"/>
FIN	<input checked="" type="checkbox"/>
S & T	<input checked="" type="checkbox"/>
F & A	<input checked="" type="checkbox"/>
RD	<input checked="" type="checkbox"/>
RHDO	<input checked="" type="checkbox"/>
P.C.	<input checked="" type="checkbox"/>
EMB/ADMIN	<input checked="" type="checkbox"/>
EMB/GSO	<input checked="" type="checkbox"/>
POL	<input checked="" type="checkbox"/>
ECON	<input checked="" type="checkbox"/>
C & R USAID	<input checked="" type="checkbox"/>
CHRON	<input checked="" type="checkbox"/>
RF	<input checked="" type="checkbox"/>

*d. Smith*

UNCLASSIFIED

TUNIS 116

*227*

4. FUNDING SOURCE: ECONOMIC SUPPORT FUNDS (ESF)
5. PRIOR REFERENCE: FY 86 CP, PAGE 157
6. PROPOSED OBLIGATION: FY 86 DOLLARS 6,500,000
7. LIFE OF PROJECT: DOLLARS 6,500,000
8. INITIAL/FINAL OBLIGATION: FY 86
9. ESTIMATED COMPLETION DATE OF PROJECT: FY 90
10. PURPOSE: TO IMPROVE THE QUALITY OF LIFE OF THE RURAL POOR IN CENTRAL TUNISIA BY ESTABLISHING A COORDINATED AND DECENTRALIZED INSTITUTIONAL APPROACH TO RURAL POTABLE WATER OPERATIONS AND MAINTENANCE, WITH USER PARTICIPATION AND USER FEES, DEMONSTRATING A MODEL TO THE GOVT WHICH MAY BE APPROPRIATE FOR ADOPTION AS A NATIONWIDE STRATEGY.

#### 11. BACKGROUND:

THE PROJECT BUILDS ON ACTIVITIES AND OBJECTIVES OF THE USAID'S CENTRAL TUNISIA RURAL POTABLE WATER PROJECT (664-0312.7) CURRENTLY UNDERWAY. PROBLEMS OF SITE MAINTENANCE AND THE DESIRE TO MAXIMIZE OPPORTUNITIES FOR LOCAL PARTICIPATION ARE KEY FOCI OF AID'S COMMITMENT IN THE DOMAIN OF POTABLE WATER.

THE RURAL POTABLE WATER INSTITUTIONS PROJECT (664-0337) WILL EMPHASIZE THE DEVELOPMENT OF WATER USER ASSOCIATIONS TO BE ORGANIZED TO MANAGE WATER POINTS AND TO IMPLEMENT USER FEES FOR POTABLE WATER TO COVER THE RECURRING COSTS OF OPERATIONS AND MAINTENANCE. RECURRENT COSTS HAVE BEEN PERCEIVED AS A SERIOUS PROBLEM IN THE CENTRAL TUNISIA GOVERNORATE OF KASSERINE, YET NO POLICY FOR GOVERNORATE WIDE COST RECOVERY HAS BEEN DEVELOPED. LONG RANGE PLANNING FOR POTABLE WATER CALLS FOR THE SOCIETE NATIONALE D'EXPLOITATION ET DE DISTRIBUTION DES EAUX (SONEDE), A WELL-MANAGED PARASTATAL, TO TAKE OVER RURAL WATER PROVISION BY THE YEAR 2000. FOR THIS TO TAKE PLACE, A COST RECOVERY SYSTEM MUST BE IN PLACE AND EFFECTIVELY OPERATING.

#### 12. PROJECT DESCRIPTION:

THE RURAL POTABLE WATER INSTITUTIONS PROJECT WILL UNDERTAKE ACTIVITIES IN THREE AREAS:

A. TECHNOLOGY TRANSFER. THIRTY NEW BOREHOLES WILL BE DRILLED, UP TO 4 EXTENSIONS WILL BE CREATED AND 2 PILOT INSTALLATIONS OF HOUSE HOOK UPS PROVIDED (AT COST TO CONSUMERS) IN THE PROJECT AREA OF KASSERINE GOVERNORATE, AND THE NORTH GAFSA AND SENED DELEGATIONS OF GAFSA GOVERNORATE.

B. LOCAL INSTITUTIONAL DEVELOPMENT. WATER USER ASSOCIATIONS WILL BE ESTABLISHED AROUND NEW AND EXISTING WATER POINTS IN THE PROJECT AREA TO OPERATE WATER SYSTEMS AND TO RECOVER OPERATIONS AND MAINTENANCE COSTS OF THE WATER SYSTEMS THEY MANAGE.

C. REGIONAL INSTITUTIONAL DEVELOPMENT. A RANGE OF REGIONAL INSTITUTIONAL DEVELOPMENT ACTIVITIES ARE PLANNED. WITHIN THE GOT'S CENTRAL TUNISIA DEVELOPMENT AUTHORITY (CTDA) A NEW UNIT, THE UNITE D'AUTOGESTION, WILL BE ESTABLISHED TO SUPPORT THE CREATION AND DEVELOPMENT OF THE WATER USER ASSOCIATIONS AND ACT AS A FACILITATOR FOR THEM IN THEIR DEALINGS WITH OTHER GOVERNMENT ENTITIES. SERVICES OF A TUNISIAN A AND E FIRM WILL BE PROVIDED TO CTDA ENGINEERING STAFF TO ASSIST WITH WATER POINT CONSTRUCTION MONITORING. TECHNICAL ASSISTANCE WILL BE PROVIDED TO THE MAINTENANCE BRIGADE OF THE PROGRAMME DE DEVELOPPEMENT RURAL (PDR) TO IMPROVE PERFORMANCE AND CAPABILITY FOR SYSTEM REPAIR. SITE SANITATION AND IMPROVED HOME WATER STORAGE WILL BE THE FOCUS OF TECHNICAL ASSISTANCE TO THE DIRECTORATE OF PUBLIC HEALTH. THE UNITE D'AUTOGESTION WILL ALSO WORK WITH REGIONAL AND LOCAL WATER COMMITTEES IN MONITORING OPERATIONS AND MAINTENANCE OF WATER POINTS.

13. RELATIONSHIP OF THE PROJECT TO A.I.D. STRATEGY: THE PROJECT WILL CONTINUE A.I.D. SUPPORT FOR INSTITUTION BUILDING AND WILL CLEARLY SUPPORT PROGRAM OBJECTIVES AND PRIORITIES SET FORTH IN THE A.I.D. POLICY PAPER ON DOMESTIC WATER AND SANITATION DATED MAY 1982.

THE TUNISIAN PRIVATE SECTOR WILL BE INVOLVED IN PROJECT ACTIVITIES BOTH THROUGH THE HOST COUNTRY CONTRACT TO BE NEGOTIATED WITH A TUNISIAN A AND E FIRM AND THROUGH RELIANCE OF ASSOCIATIONS ON PRIVATE SECTOR ENTREPRENEURS FOR BASIC MAINTENANCE OF WATER POINTS.

14. HOST COUNTRY AND OTHER DONORS:

OTHER DONORS CURRENTLY INVOLVED IN POTABLE WATER ACTIVITIES INCLUDE THE GERMAN DEVELOPMENT BANK (KFW), IBRD, UNICEF AND UNDP/WHO. THE GOT CONTRIBUTION TO THIS A.I.D. PROJECT IS ESTIMATED AT DOLLARS 3,000,000.

15. MAJOR OUTPUTS:

ALL YEARS:

1. WATER USER ASSOCIATIONS  
ESTABLISHED AND FUNCTIONING

UP TO 36

2. NEW WATER DISTRIBUTION SITES

-30 BOREHOLES,

UNCLAS SECTION 02 OF \* TUNIS 00116

ESTABLISHED AND FUNCTIONING.

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3. HYDROGEOLOGIC DATA BASE IN  
CENTRAL TUNISIA IMPROVED.

-  
-  
-

16. AID-FINANCED INPUTS

-

TECHNICAL ASSISTANCE

TRAINING

COMMODITIES

EVALUATION/AUDIT

OTHER COSTS (E.G. CONSTRUCTION)

INFLATION/CONTINGENCIES

TOTAL

4 .EXTENSIONS AND  
2 HOUSE HOOK-UP  
SYSTEMS COMPLETED.

-HYDROGEOLOGIC  
DATA IMPROVED  
THROUGH TEST DRILLING  
IN 1986, 87, 88 WITH  
NEW RESEARCH METHODS.

LIFE-OF-PROJECT  
(DOLLARS THOUSANDS)

1162

189

369

232

3967

581

6500

17. U.S. FINANCING (IN THOUSANDS OF DOLLARS):

-ESTIMATED OBLIGATIONS/EXPENDITURES/UNLIQUIDATED THROUGH  
SEPTEMBER 30, 1985: NONE

-PROPOSED FISCAL YEAR 1986 OBLIGATION: DOLLARS 6,500,000

-FUTURE YEAR OBLIGATIONS: NONE

UNCLAS SECTION 02 OF \* TUNIS 00116

230

~~UNCLAS SECTION 03 OF 03 TUNIS 00116~~

-ESTIMATED TOTAL COST: DOLLARS 6,500,000

-PRINCIPAL CONTRACTORS OR AGENCIES: TO BE DETERMINED. UNQUOT

2. PROJECT DOCUMENTATION WILL BE SENT TO AID/W AS SOON AS FINALIZED.

3. ADVISE WHEN CP SENT TO HILL AND EXPIRATION DATE THEREOF.  
SEBASTIAN

BT  
#0116

NNNN

UNCLAS SECTION 03 OF 03 TUNIS 00116

ANNEX X

AID Budget

A.	<u>Technology Transfer:</u>	
	1. Technical Assistance	\$ 631
	2. Construction	\$3,967
	3. Commodities	200
B.	<u>Institutional Development:</u>	
	1. Technical Assistance	\$ 531
	2. Commodities	\$ 164
	3. Training	\$ 189
C.	<u>Evaluation/Audit:</u>	\$ 232
D.	<u>Inflation/Contingency:</u>	\$ 586
	Total	===== \$6,500

GOT Budget  
(\$000)

A.	<u>Technology Transfer:</u>	\$ 985
B.	<u>Institutional Development:</u>	\$ 808
C.	<u>User Fees:</u>	\$ 920
D.	<u>Inflation/Contingency:</u>	\$ 687
	Total	===== \$3400

137