

PDHAB-927

CENTRAL TUNISIA RURAL DEVELOPMENT PROJECT PAPER

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET CONSOLIDATED	1. TRANSACTION CODE <div style="border: 1px solid black; display: inline-block; padding: 2px;">A</div> A ADD C CHANGE D DELETE	PP 2. DOCUMENT CODE <div style="border: 1px solid black; display: inline-block; padding: 2px;">3</div>
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3. COUNTRY/ENTITY TUNISIA/USAID	4. DOCUMENT REVISION NUMBER <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>
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5. PROJECT NUMBER (7 digits) <div style="border: 1px solid black; padding: 2px; display: inline-block;">664-0312</div>	6. BUREAU/OFFICE A. SYMBOL NE	B. CODE <div style="border: 1px solid black; padding: 2px; display: inline-block;">03</div>	7. PROJECT TITLE (Maximum 40 characters) <div style="border: 1px solid black; padding: 2px; display: inline-block;">Central Tunisia Rural Development</div>
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8. ESTIMATED FY OF PROJECT COMPLETION FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">84</div>	9. ESTIMATED DATE OF OBLIGATION A. INITIAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">79</div> B. QUARTER <div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div> C. FINAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block;">81</div> (Enter 1, 2, 3 or 4)
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10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) -						
A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. LC	D. TOTAL	E. FX	F. LC	G. TOTAL
AID APPROPRIATED TOTAL	2192	3000	5192	4020	8080	12100
GRANT	2092	600	2692	3920	3780	7700
LOAN	100	2400	2500	100	4300	4400
OTHER U.S. Title I Counterpart		850	850		850	850
HOST COUNTRY		4140	4140		5640	6640
OTHER DONOR(S)						
TOTALS	2192	7990	10182	4020	15570	19590

11. PROPOSED BUDGET APPROPRIATED FUNDS \$000.									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH CODE		E. 1ST FY <u>79</u>		W. 2ND FY <u>80</u>		X. 3RD FY <u>81</u>	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	H. GRANT	J. LOAN	I. GRANT	K. LOAN
(1) FN	200	210	230	2692	2500	2165	-	2843	1900
(2)									
(3)									
(4)									
TOTALS				2692	2500	2165	-	2843	1900

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT		12. IN DEPTH EVALUATION SCHEDULED
	P. GRANT	Q. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	
(1) FN					7700	4400	<div style="border: 1px solid black; display: inline-block; padding: 5px;"> MM YY </div>
(2)							
(3)							
(4)							
TOTALS					7700	4400	

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET

1

 NO
 YES

14. ORIGINATING OFFICE CLEARANCE SIGNATURE TITLE <i>Herman O. Marshall</i> Director, USAID/Tunis (Acting)	15. DATE DOCUMENT RECEIVED IN AID/W OR FOR AID/W DOCUMENTS. DATE OF DISTRIBUTION DATE SIGNED <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">1</div> <div style="border: 1px solid black; padding: 2px;">1</div> <div style="border: 1px solid black; padding: 2px;">7</div> <div style="border: 1px solid black; padding: 2px;">78</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div style="border: 1px solid black; padding: 2px;">MM</div> <div style="border: 1px solid black; padding: 2px;">DD</div> <div style="border: 1px solid black; padding: 2px;">YY</div> </div>
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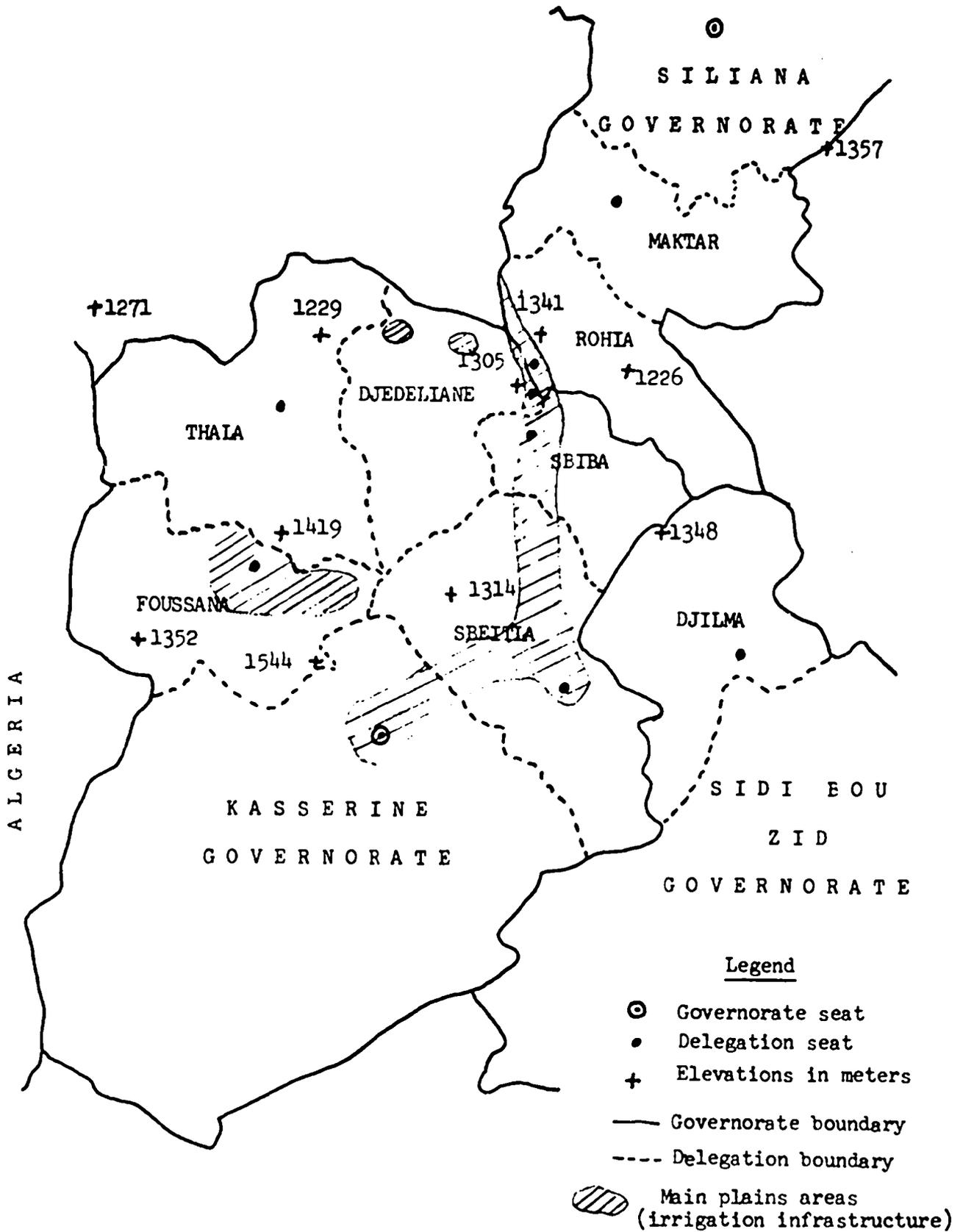
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CTRD PROGRAM AREA

(Scale: 1:750,000)



CTRD PROGRAM AREA SHOWING POPULATION DENSITY AND MAIN
LINES OF ROAD COMMUNICATION

To El Kef

To Siliana, Tunis

To El Kef

Maktar

To
Kairouan

To El Kef

Rohia

Djedeliane

Sbiba

Thala

To
Kairouan

Foussana

To
Kasserine

Sbeitla

Djilma

To
Kasserine

To Sfax

Legend

== Paved road

- - - - - Dirt track

○-○-○-○-○ Dirt track improvement
financed by AID loan

Population density:
Sector having:

■ More than 12 houses per km²

▒ 9-12 houses per km²

□ Less than 9 houses per km²

II. PROJECT DESCRIPTION

A. Program Summary

Central Tunisia is a region comprising portions of four Governorates: Gafsa, Sidi Bou Zid, Kasserine and Siliana. Its population of 1,000,000 plus is rural and highly disadvantaged. Past Government of Tunisia (GOT) efforts to provide advantages to interior regions like Central Tunisia have encountered three constraints. Nationally-oriented programs have been unwilling to channel increased funds into regions. There has been insufficient analysis of target groups and investment possibilities. Intervention models have not been sufficiently low-cost and productive of reasonable cost/beneficiary ratios.

The GOT has adopted regional planning and increased resource allocations as a means of correcting Central Tunisia's regional disparity. Action, starting in 1979, will include: special organizational and intervention measures, expanded GOT resource allocations, and problem-centered bilateral and multilateral foreign assistance activities in the region.

B. Economic Situation -- Central Tunisia (See also Annex B)

Tunisia contains two major geo-economic sub-units. One is coastal with extensive public services and infrastructure. Per capita incomes average over \$1,000 annually. The other is a steppe and desert interior. A subsistence agriculture operates under semi-arid conditions. Infrastructure and public services are minimal and annual per capita income is \$75.

Central Tunisia is a portion of the interior sub-unit. It is at an economic development level somewhere between the Sahel countries and rural Bangladesh. A recent socio-economic survey of one "secteur" in Central Tunisia found an average per capita income level of about \$40. It also noted that the bulk of the "secteur" population was virtually unreached by any public services or public investment.

This latter situation reflects the effects caused by a circular policy trap. GOT project standards and costs are determined at a national level in order to suit the high income coastal geo-economic sub-unit. Willingness to invest public funds in the interior geo-economic sub-unit is limited by perceptions of the area's weak economic resource base. The result is a small quantity of high-cost infrastructure and services activities installed by the GOT. This leaves most of the interior population unserved or drastically underserved. It does nothing to maximize the few economic potentials which the interior may possess.

C. Agricultural Situation -- Central Tunisia (See also Annex B)

There is marked heterogeneity in terms of topography, climate, and available land and water resources. Nowhere, except within a few irrigated perimeters, are production conditions of the best. Soil resources are maldistributed. Erosion is a major problem. Range overgrazing is widespread. Wheat and barley are the principal cereal grains produced. Arboriculture exists in some dryland areas, particularly olives, almonds, and pistachios. Forage is extremely limited. All agricultural conditions are affected by the limited rainfall which ranges between 400 mm. and 250 mm. annually.

D. Past Development Policy Context -- Central Tunisia
(See also Annex D)

Two national agricultural policies have affected the character of production activities in Tunisia during the past two decades. A policy of agricultural collectivization existed during the 1960's. Since 1969, this has been scrapped in favor of encouraging private farmers.

Within Central Tunisia, with the new emphasis upon private farming, 55 percent of the agricultural lands in a governorate like Kasserine are in the hands of individual farmers. They average about 14 hectares each and 87 percent have less than

^{1/}
20 hectares. The balance of the lands are either in the process of being titled, will ultimately be titled, or comprise state lands. Presently, there are hardly any collective lands remaining in the area of Central Tunisia where USAID-assisted projects are contemplated.

The GOT private enterprise-orientated policies after 1969 have been accompanied by a different style of operation and new objectives in operation. They emphasize provision of modest amounts of public goods, without disturbance of local political economies, largely through the activities of "line" agencies and the use of discretionary rural development funds by Governors.

The existing GOT Rural Development Program (PDR) operates from a program doctrine which asserts that change in Central Tunisia must be incremental, planned, and implemented with local authorities and indigenous leadership. It must operate in a non-coercive manner, and not operate to the obvious disadvantage of any portion of the rural population.

USAID has been working with and through the PDR for more than two years. That experience has highlighted the strengths and weaknesses of the PDR system. The PDR lacks sufficient planning at the implementation level and is overplanned at the center. It has not succeeded in bringing the "line" agencies together in supporting appropriate technological and investment interventions in the area. It has not overcome the contradictions between the doctrine of "local incrementalism" and the demands of the central budgetary process which imposes "line item" programming on top of an objective of flexible response. Expanding policy discussions within the GOT and between USAID and the GOT have focussed Tunisian thinking increasingly on these issues. The policy changes of the past 12 months point to the possibility for significant improvements.

Experience with the PDR system has also shown that renewed reliance upon the capacities of the private enterprise system in the area offers particular opportunities for selective modest improvement. Levels of entrepreneurial and technical capacity have been uncovered. The modalities for exploiting

^{1/} "Centre National des Etudes Agricoles," July 1974.

this capacity are embryonic. Private sector initiative in the expansion of small-scale irrigation has been considerable. By contrast, private sector initiatives in the livestock sector have been poor and generally limited to feedlot operations.

E. Proposed Development Policy Context -- Central Tunisia

Elaborating a development program for an area which is deficit in all major resources calls for some very special assessment. Land is abundant, but centuries of erosion and low levels of annual rainfall diminish its unit value and utility. Labor is present, but the extreme dispersal of population and lack of skills training affects both its mobilization and value. Capital is limited. Private capital within the area is minimal, but some surplus does exist either as a result of remittances from outside the region or in certain relatively better endowed locations within the region. Public investment of capital has been limited, and the poverty of the rest of the resource base has almost totally deterred the investment of private capital by entrepreneurs from outside the region. Usable technologies, adapted to the land, labor, and capital conditions are almost non-existent.

Careful disaggregation of these factors indicates that there are two which, if coupled to managerial and planning interventions, might successfully mesh with existing private enterprise initiatives. These comprise technology and capital -- with the emphasis on the former.

Meaningful differences in factor endowments do exist among various parts of Central Tunisia. These concentrations of advantage are not of extreme size and there are certainly no hidden pockets of vast potential wealth in the area. But, there are clearly identifiable possibilities for both economic and social investment and these promise reasonable rates of return.

The technological needs of the region do not require an upgrading of nationally existing and designed technologies. Rather, those needs demand a down-sizing and re-costing of technologies drawn from the national technological base.

BEST AVAILABLE DOCUMENT

Illustrations of this latter point are numerous. High yield variety cereals technology is well-established in the better-watered northern plains. However, no investment in such technology has occurred for the semi-arid cereals area of Central Tunisia. Heavy capital investment in deep well irrigation systems and methods of water use have taken place on state-organized perimeters in Tunisia. Little investment or technical support is addressed to individual farmers in Central Tunisia as they seek to utilize groundwater resources through shallow well or spring irrigation. An efficient national potable water agency has engineered high quality water systems for the high-density coastal population. The costs of this technology become prohibitive under the low-density population conditions of Central Tunisia.

Considering these circumstances, the GOT has adopted a policy for Central Tunisia which will make it possible to promote:

1. Planning and managerial efficiencies in GOT inputs.
2. Economic and social investment in possibilities offering reasonable rates of return.
3. Diffusion of low-cost technologies.

F. Central Tunisia Development Authority (CTDA) --
(See also Annex C)

The instrumentality chosen by the GOT to foster development in Central Tunisia is the Central Tunisia Development Authority (CTDA). It will be a financially autonomous public authority headquartered in the region. CTDA will operate under the general supervision of the Ministry of Agriculture. A Board of Directors will set policy and will be comprised of representatives from various Ministries -- Agriculture, Plan, Finance, Industry, Equipment, Health, and Social Affairs, Governorates, the Party (PSD), and farmer or other concerned organizations.

BEST AVAILABLE DOCUMENT

The CTDA will be a new type of institution in Tunisian practice. Its closest existing model are the Offices de Mise en Valeur that have been created to administer public irrigation perimeters. The CTDA, by contrast, will be responsible for both dryland and irrigated agriculture in the area and for promoting the integrated development of the area.

In order to perform such a mission, the CTDA will absorb most, if not all, agricultural development functions currently performed by the Offices de Mise en Valeur in the area and by the regional field services of the Ministry of Agriculture outside irrigated perimeters. In sectors other than agriculture, the CTDA will be performing a planning, coordinating, and monitoring role, without necessarily taking over day-by-day operations. It is expected that most, if not all, developmental interventions within the CTRD program area will be funded through the CTDA whether or not they are carried out directly by the Authority or farmed out to other agencies for implementation. It will also have policy control over investment in health and social affairs infrastructure.

The CTDA is expected to inherit all the facilities, functioning administrative structures, and trained personnel cadres of the Public Irrigated Perimeters Division of the Office de Mise en Valeur in Central Tunisia. These will, in effect, constitute the nucleus of the new organization to which will be added facilities and personnel taken over from various Ministry of Agriculture field services which perform similar functions for dryland agriculture within the new Authority's zone of operation.

Authorized by Act of the National Assembly in August 1978, the CTDA is to become operational in Central Tunisia in 1979.*

G. Project Overview

A.I.D. proposes to work with the CTDA according to the strategic concepts outlined in the Strategy Paper (Annex D). The mode will be through defined sub-projects. These will focus on improved planning and managerial efficiencies in GOT inputs; economic and social investments in possibilities offering reasonable rates of return; and the diffusion of low-cost technologies. The ultimate intent is to develop and test models/techniques which the GOT can best replicate in other disadvantaged areas of Tunisia where conditions of similar marginality obtain in:

*NOTE: It is a condition precedent to a disbursement that the project be operational at the CTDA in operational in the project area

1. Agriculture.
2. Natural Resource Endowments.
3. Transport and Communications.
4. Preventive and Curative Health Services.
5. Human Resources Development.
6. Industrial and Marketing.
7. Housing.
8. Credit and Banking
9. Local Participation

Other donor activity is already taking place or is planned in some areas of Central Tunisia. A.I.D. will seek opportunities for collaboration in such initiatives. These include World Food Programs, FAO, Swedish International Development Agency, World Bank, Federal Republic of German and others.

The A.I.D.-assisted sub-projects will take place in eight Delegations inhabited by a population of slightly more than 200,000 (See Annex B). All are contiguous; but they are administered by the Governorates of Siliana, Kasserine, and Sidi Bou Zid. All will be within the zone designated as a part of the area of responsibility of the Central Tunisia Development Authority.

Two of the Delegations comprise areas where A.I.D. and the GOT first began to test Central Tunisia rural development models in 1976. Those Delegations -- Rohia and Maktar -- will continue to provide data and implementation insights helpful to the planning, management and evaluation of new sub-projects within the A.I.D.-assisted zone.

Particular A.I.D. criteria will govern the selection and design of A.I.D.-assisted sub-projects. These include:

--Sub-projects must fit within the general guidelines and policy interests of A.I.D.

--Sub-projects must fit within the general guidelines and policy interests of the CTDA.

--The CTDA will be the responsible agency handling the A.I.D.-assisted sub-projects in the field.

--All A.I.D.-assisted sub-projects will be subject to review and approval by the Ministry of Plan.

--A.I.D.-assisted sub-projects will be designed, funded and operational within a three-years (FY 79, FY 80, FY 81) time horizon. Though individual sub-projects may have much longer periods for completion, the funding and technical assistance must be in place prior to the end of FY 81.

--A.I.D.-assisted sub-projects will require very limited numbers of long-term technical consultants who are residents outside Tunis and are able to operate completely without any logistic or other forms of support from the Mission.

--Emphasis upon on-going forms of evaluation designed to produce evidence useful to future GOT replication of successful interventions elsewhere.

--Across-the-board Mission design and monitoring of Central Tunisia Rural Development sub-projects in the various fields and disciplines of programming interest to the Agency including Agriculture, Health, Population, Human Resources Development, Science and Technology, Housing, Rural Development, Potable Water, Rural Electrification, Rural Industries and Off-farm Employment and Women in Development.

H. Inputs and Expected Outputs (See Log Frame Annex A)

This project will be composed of a series of sub-projects, each of which will be designed, reviewed, funded, and monitored separately.

Initially, three sub-projects will be the first elements of this project to be submitted in FY 79. Others will be designed and submitted in FY 79 and FY 80. Depending upon the degree of success experienced in the first sub-project starts, additional sub-projects may also be submitted in FY 81.

The initial three sub-projects contain \$12,100,000 in U.S. technical assistance, participant training, loans, grants, and commodities. The sub-projects include:

1. Area Development (\$4,500,000)

Provision of technical assistance and training to the Evaluation and Planning Unit (EPU) of the Central Tunisia Development Authority and the creation of an "experimental fund" to underwrite the costs of adapting and testing low-cost technologies to the region. Expected Outputs include:

-- 25 CTDA staff and governorate staff trained in regional planning.

-- 13 CTDA staff trained in data management and evaluation.

-- 15 "Experimental Fund" adaptation and test of low-cost technologies.

-- 1 regional data management system.

-- 1 draft regional plan

-- 4 sub-project designs.

(-- 1 set of evaluation standards and indicators for measuring project performance and impact in the region.)

2. Small Farmer Irrigation (\$4,800,000)

Exploitation of the underutilized groundwater of the region through introducing improved shallow well, spring-fed irrigation, and irrigated perimeter water use management for substantial income gains for a small percentage of the zonal population. With completion of this activity, the potential for expansion of irrigation sites will be exhausted and so the scope of the activity will be self-limiting. The project will include limited technical assistance in on-farm water management and an extension element may well follow on as a new sub-project in FY 81. Expected Outputs include:

-- 300 improved shallow wells.

-- 205 constructed new shallow wells.

-- 99 development of natural springs.

-- 3 developments of new irrigation perimeters (from 4 wells).

-- 2,000 hectares of land with improved irrigation.

-- 100 hectares of land newly irrigated.

-- 3,500 families benefited.

-- 30 CTDA technical personnel with upgraded skills in water management and irrigation engineering.

3. Dryland Farming Systems Research (\$2,800,000)

Test and adaptation of known semi-arid agricultural technologies to Central Tunisia. This sub-project is based upon field test and demonstration in the Central Tunisia area. Technical assistance, some limited training, and special equipment provided. An extension element may well follow on as a new sub-project in FY 81. Expected Outputs include:

-- Dryland farming systems tests in 8 delegations.

-- 8 Delegation pilot-demonstration areas.

-- 160 dryland farmers participating in tests and demonstrations of barley, other cereals, etc.

-- Development of flexible packages of recommended dryland farming techniques.

I. Future Sub-Projects

Other sub-projects are in various stages of planning or discussion either with the GOT or within the Mission at Tunis. The most advanced of these is Potable Water. In that case, a great deal of design work and investigation has already been accomplished. The purpose of such a sub-project would be to make cleaner water available to more than half the population. This will require the creation and adoption of a rational methodology for selecting potable water sites for development and assigning tasks to the implementing agencies concerned. The latter comprise SONEDE, CARE/Medico and Genie Rural, each of which has differing administrative capacities and technologies.

The probable mode selected for differentiating between sites and instrumentalities chosen to do the work will be costs per beneficiary for each type of available technology. Once a workable sub-project design can be developed incorporating this mode, it is probable that potable water programming in the area can absorb as much as \$10,000,000 in A.I.D. inputs. CTRD potable water strategy is elaborated in the Area Development Paper. Other, far less developed, sub-project possibilities include:

1. Dryland small farmer fruit tree production.
2. CTDA extension reorganization and training.
3. Preventive health services.
4. Small industries development.
5. Rural-based skills training.

III. Project Specific Analyses

A. Economic Feasibility

All of the sub-projects that are to be designed will be reviewed from the standpoint of their costs, relationship to the limited factor endowments of the Central Tunisia region, and prospective returns.

B. Social Soundness Analysis

The 8 Delegations of interest to A.I.D. are in a state of what might be termed "reactive change". That is, because of the very poor local resource base, the zone's population has been pushed and pulled through a series of wrenching social changes. These have been historical, such as the rapid trend away from nomad and pastoral practices in the area during the past 30 years. They have also been economic, caused by national agricultural policies as well as national developmental policies aimed only at accelerating the growth of better factor endowed coastal areas.

The current planned A.I.D.-assisted sub-projects or those of the future will not and cannot dramatically alter this situation. Neither will they dramatically alter the relative poverty which distinguishes the zone from the nation as a whole. They do represent an effort to optimize on the very narrow existing resource base.

The limited and unequal distribution of the most essential resource of the region, sub-soil water, makes inequity an inevitable consequence of the region's ecology. Where water exists for improved exploitation and use, sub-projects can be designed to help farmers and households gain access at the least possible cost. Where agricultural water is not available, sub-projects can be designed to aim at development of a minimum package of dry-land farming technology usable by the majority of poor farmers in the zone.

The social and economic consequences of working with these differentiated populations will be measurably different.

By seeking to optimize potentials both on drylands and irrigated areas, the project will move a modest number of poor farmers into a markedly higher economic group and make a large number of very poor farmers somewhat less poor. Such activities can have only a limited impact on the overall intra-zone equity issue.

To concentrate exclusively on either the dryland population or the irrigated-area population could alter the mix outcomes either towards more equity (by staying out of irrigation) or more economic return for a few (by staying out of the drylands). A decision to move on both fronts is taken with full awareness that under the best of conditions, the consequence will be considerably improved incomes and quality of life for a few of the presently poor and very modestly improved incomes and quality of life for a large portion of the remainder.)

This situation has prompted a series of field studies by American and Tunisian social scientists in order to obtain a better perspective about just what portions of the population can be affected, and to what degree, through various developmental interventions. From these field surveys, which included highly controlled surveys of a scientifically selected sample of the population of a single "secteur" in the zone, it has been possible to develop a rough typology of the major categories of household (classified by economic activity) and to suggest the income ranges associated with each type.

The attached tables relate descriptive features of the overall zone population with projected incidence of benefits arising from suggested interventions such as those of the proposed agricultural sub-projects (Table 1). They also present selected socio-economic indicators for CTRD governorates as contrasted with national figures (Table 2).

These, taken together with the findings of Attia and Hopkins, strongly suggest that the first three proposed sub-projects are socially sound.

2/ Attia, H., Tunisie Centrale: "Aspects Sociaux", 1978, pp. 350
Hopkins, N., "Social Analysis of the Central Tunisia Project", 1978, pp. 130

TABLE 1
BENEFICIARY ANALYSES OF CTRD INTERVENTIONS

HOUSEHOLD TYPE	CTRZ ZONE POPULATION				BENEFICIARY ANALYSIS			Comments
	No. In Zone	% of Zone Population	Per Capita Income Range (\$)	Per Capita Income Average (\$)	Short-term direct Benefits (dur. proj)	Long-term direct Benefits (aft. proj)	Indirect & Secondary Benefits only	
1. Perimeter Irrigation								
a. Existing	2,000	7	100 - 600	200	2,000			Irrigation
b. Proposed	210	1	150 - 300	200	210			Irrigation
2. Shallow Well (Irrigation is predominant mode)								
a. Existing	1,000	3.5	150 - 800	350	600		400	Irrigation
b. Proposed	225	1	200 - 500	350	225			Irrigation
c. Springs			150 - 300	200	250			Irrigation
3. Dryland (no irrigation)	23,000	76.5	20 - 300	60	500	5,000	10,000	Drylands
a. Plains and plateau				70				
b. Forest				35				
4. Mixed Farms (Mostly dry by area mostly irrigation by value)	1,000	3.5	150 - 1,000	250		1,000		Drylands
5. Wage-Based								
a. Govt. Official	1,000	3.5	200 - 2,000	800				
b. Private Worker	1,000	3.5	200 - 500	300	500		500	All
c. State Farms	500	1.5	300 - 600	400				
TOTALS	<u>30,000</u>				<u>4,285</u>	<u>6,000</u>	<u>10,000</u>	

TABLE 2

CENTRAL TUNISIA RURAL DEVELOPMENT:
TARGET GROUP PROFILE DATA

Socio-Economic Indicators	Siliana	Kasserine	Sidi Bou Zid	Tunisia Average
<u>IMPROVE HEALTH CONDITIONS</u>				
No. of inhabitants per physician	19,654	13,175	20,801	4,067
No. of inhabitants per para-medical	1,946	1,311	2,288	587
No. of inhabitants per hospital bed	1,524	1,422	3,751	448
No. of inhabitants per dispensary	11,561	12,516	12,043	11,664
Average area (Km ²) served per dispensary	339	414	379	217
No. of visits to health facilities per 1,000 inhabitants	163	196	115	217
Hospital bed occupancy rate	60	71	59	71
<u>IMPROVE NUTRITION CONDITIONS</u>				
% of rural population meeting 100% of minimum nutrition requirements				
-- calories	96	77	72	81
-- proteins	92	84	83	84
-- calcium	40	22	25	25
-- iron	26	94	84	36
-- vitamin A	20	4	20	25
-- vitamin B ₁	100	100	94	98
-- vitamin B ₂	36	22	34	26
-- vitamin PP	94	89	88	80
-- vitamin C	69	49	73	78

TABLE 2 (Continued)

<u>Socio-Economic Indicators</u>	<u>Siliana</u>	<u>Kasserine</u>	<u>Sidi Bou Zid</u>	<u>Tunisia Average</u>
<u>IMPROVE HOUSING CONDITIONS</u>				
% of houses with two or less rooms	83	85	89	71
Temporary housing as % of total housing	30	30	35	25
% of housing with following amenities:				
-- kitchen	50.6	21.3	15.1	44.3
-- toilet	18.8	14.1	11.5	43.3
-- bathroom (equipped)	1.0	0.7	0.7	5.2
-- bathroom (unequipped)	0.2	1.3	1.1	6.1
-- washroom	0.5	1.1	0.8	3.4
-- sewerage	6.6	1.7	1.5	20.7
-- well	3.1	1.7	4.9	12.2
-- electricity	8.1	8.8	4.8	34.2
-- running water	8.9	9.4	2.4	26.4
<u>EXPAND BASIC EDUCATION OPPORTUNITIES</u>				
% of adult males who are literate	48	50	48	58
% of adult females who are literate	21	16	13	32
% of adult population who are literate	35	33	31	45
Female primary students as % of total primary students	34	29	22	39
Ratio of primary students/total population	0.14	0.13	0.12	0.17
Ratio of secondary students/total population	0.01	0.02	0.01	0.03
Ratio of primary and secondary students/ population ages 5-14 years old	0.56	0.52	0.46	0.71

TABLE 2 (Continued)

<u>Socio-Economic Indicators</u>	<u>Siliana</u>	<u>Kasserine</u>	<u>Sidi Bou Zid</u>	<u>Tunisia Average</u>
<u>ENCOURAGE FERTILITY DECLINE</u>				
Crude birth rates	37	42	44	36
% population under age 15 years	45	48	48	44
Dependency ratio	0.92	1.04	1.04	0.90
Women of reproductive age per family planning center	2,351	3,457	3,574	2,684
Average area (Km ²) served per center	320	552	514	228
Women of reproductive age per family planning personnel	4,703	5,185	10,007	4,313
Average area (Km ²) served per personnel	640	828	1,440	367
Acceptors of family planning as % of women of reproductive age	19	28	9	27
<u>PROVIDE POTABLE WATER</u>				
Per capita consumption of persons with house connections (liters/day)	53	46	50	69
Per capita consumption of persons using public taps (liters/day)	5	13	16	8
% of population served by house connection	11	13	4	32
% of population served by public tap	19	16	12	29
% of population not served by any public potable water system	70	71	84	39

C. Technical Feasibility

The success or failure of this project will be determined by its ability to identify, develop, and implement technically correct and cost-effective solutions to the development problems of a poor and isolated region. This poses challenges of varying technical difficulty and opportunity.

A first category of technical problems concerns full exploitation of the groundwater potential for small farmer agriculture. These problems are the most easily solved. The applicable irrigation technologies have been identified. They are within the capacity of Tunisian technical agencies to administer. U.S. technical inputs are needed, principally, to improve on-farm water management.

A second category of problems requires the rescaling of known technologies to the context of the region. Infrastructure (notably potable water) and service delivery problems are among these. All the components of the solutions exist. Some of them already exist in Tunisia. The project should supply the missing technical elements and assist in testing the right "mix" of those elements suitable to Central Tunisia.

A third category of technical problems is epitomized in the small dryland farming areas of Central Tunisia. A worldwide semi-arid farming technology is only just beginning to take shape. It is strongest in subjects most useful to Central Tunisia -- wheat and barley -- but it is still in need of adaptation to the Tunisian milieu. This is a technical matter of much complexity. Although it does not call for basic research, it does call for highly controlled, adaptive field testing. There may also be opportunities for significant productivity increases in dryland fruit trees.

Can these three levels of technical transformation be successfully handled by the CTDA? Can the project deliver the key technical components which the Tunisians cannot provide from their own resources? The answer is a qualified "yes". The technical, managerial, and analytical skills exist among Tunisian cadres to handle the range of technical problems addressed in this project. But the problem of mobilizing these skills around a relatively unglamorous project such as regional development in remote, uncomfortable, and hardship-ridden Central Tunisia is a very large one indeed. This is a technical administrative problem and the proposed solutions include:

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1. Salary premiums which will be paid to technicians by CTDA. (Instead of practicing as a 200 "Class A" Authority - premiums will be paid from 200 "Class A" Authority.)
2. Attraction to technicians of working with a high caliber U.S. regional planning staff.
3. Opportunity to earn a U.S. diploma in regional planning from the University of Wisconsin at the end of a three-year tour with the CTDA.
4. Computer facilities and related skills training on site.
5. Opportunity to participate in vanguard applied and policy-related research.

The project is so designed that it can deliver missing ingredients through drawing upon known U.S. resources. In the area of regional planning skills and in irrigation as well as water management, the U.S. is well-positioned to deliver useful technical assistance inputs. The dryland farming adaptive research draws on areas of U.S. technical capacity. Other comparative advantages in U.S. technical assistance capacity will be drawn upon for various elements of the project.

D. Environmental Analysis

The project zone is an environmentally degraded area which, forested in Roman times, is now barren, eroded, and contains only local pockets of arable soils. Wind and water erosion have been accelerated by human patterns of land and water use.

The CTRD project will be aimed at identifying development practices and investments consistent with the weak resource condition of the area. Each sub-project will be designed to have an environmentally positive impact.

In some sub-projects, in particular, notably those involving soils and water, caution will have to be exercised in order to insure that well-intentioned interventions do not have unintended environmental consequences.

None of the sub-projects proposed or contemplated in the future will change the character of the land (except in the case of soil and water) or affect atmospheric or natural resource conditions. Possible cultural and socio-economic effects of the currently proposed sub-projects have been carefully examined by Nicholas Hopkins and his favorable findings indicate that the sub-projects are adequately designed.

At the PID stage, the Mission submitted Initial Environmental Examinations (IEE's) which recommended negative determinations for each of these sub-projects. In the light of Near East Bureau guidance contained in State 246507, it is now recommended that the first sub-projects submitted (Area Development, Dryland Farming Systems, and Small Farmer Irrigation) be approved on the basis of the previous IEE's. It is further recommended that a threshold decision be made to undertake a General Environmental Assessment of the project zone prior to the approval of further sub-projects.

This recommendation rests, in part, on the point that the three initial sub-projects will be slow in terms of exercising any appreciable effects upon the area as a whole. The Area Development sub-project will exert effects through planning and the operations of the "Experimental Fund". The Dryland Research sub-project, by its nature, will seek to conserve soils, water, etc. The Small Holders Irrigation sub-project will contain constant engineering attention to the aquifer situation and, in any case, the range of activities planned will only affect a few local areas in the region.

By contrast, the activities currently under design for a potable water sub-project may raise issues of an environmental nature about over-taxing aquifers in order to meet competing demands for water or water-related health issues of varying kinds. Under these circumstances, completion of a General Environmental Assessment should take place prior to approval of the Potable Water sub-project. Such a general Environmental Assessment should also be centered on the major types of development interventions forecast by the GOT and A.I.D. for FY 80 and beyond. It should be possible to integrate the outputs of this Assessment directly into the proposed CTDA Evaluation and Planning Unit and thereby use the Assessment as a device to improve Tunisian awareness of environmental assessment techniques.

E. Analysis of Credit and Land Titling Issues in the CTRD Program (See Annex E)

IV. Evaluation Plan (See also Annex F, "Information System for the CTDA")

At the Near East Advisory Committee PID review, attention focused on the need for a strong, clearly elaborated evaluation component in the CTRD project. Bureau guidance was specific.

Because of strong assistance from the Near East Bureau evaluation staff and from the Chairman of the Cornell University Rural Sociology Department, it has been possible to define an evaluation system consistent with Bureau guidance. Additionally,

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because of concern about the management implications of a rural development program, which is regionally sited and operates through sub-projects, attention has also been paid to evaluation of selected management concerns over time.

With reference to the non-management aspects of the proposed evaluation system three elements are involved:

A. Identification of quantifiable indicators relevant to project goal and sub-project purposes.

B. Elaboration of a data system and the development of trained staff.

C. Evaluation methodology.

These are sequentially treated below:

1. The range of quantifiable indicators to be collected and analyzed is fully elaborated in two supporting documents:

a. Binnendijk, "Evaluation Plan for the CTRD Project", October, 1978.

b. Binnendijk, "Baseline Data Requirements for CTRD", June, 1978.

These indicators are too numerous to detail fully here but a listing of the functional groupings reveals the range:

(1) Socio-economic characteristics of the Central Tunisia Population

-- spatial distribution, settlement patterns, population densities, etc.

-- migration data (inter-and intra-regional).

-- income: intra-regional and intra-household, etc.

(2) Characteristics of the Environment and Agricultural Systems

-- data on topography, soils, climate, rainfall (baseline).

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-- indicators of resources management:
water table levels, erosion indicators, deforestation measures.

-- frequency and magnitude of crop failures.

-- agricultural yields and production data
(irrigated and dryland) etc.

(3) Characteristics of Infrastructure and Services

-- efficiency measures: cost per beneficiary,
per unit, per year; capital vs. O&M costs ratios.

-- location and conditions of infrastructure:
roads, produce collection centers, potable water systems, waste
disposal systems, small and deep irrigation wells, energy sources and
uses, small industries, extension and service delivery structures,
repair shops, clinics, schools, etc.

2. A data system and staffing arrangements are elaborated
in detail in the analysis prepared by the Cornell data consultant, Dr.
Frank Young, entitled, "An Information System for the Central Tunisia
Development Authority," October 1978.

It is proposed that this project utilize the technical services of Dr.
Young and his macro-social accounting staff at Cornell to assist the
CTDA in establishing, staffing, and operating a regionally based
information system.

This system will be centered upon an initial ~~five~~ ^{two}-person Tunisian pro-
fessional staff in the Evaluation and Planning Unit of the CTDA. This
staff will be trained and supported by French-speaking data management
technicians drawn from Cornell on a continuous but intermittent basis
over the life-of-the project. The staff will carry out a wide range
of data collection and data management operations covering the full
range of quantifiable indicators outlined above.

The trained EPU staff will be equipped with a mini-computer in their
Kasserine headquarters. Specialized evaluation and data management
software will be designed by the Cornell contractors. The staff will
have access to additional funds (OE) which have been earmarked for
contract data collection services in those areas where it is more
practical for the EPU to use existing data collection agencies or even
simply to recast existing data files.

Data collection methods will be eclectic, including:

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- a. An inventory of secondary sources from agency documents, records and files.
- b. Informant surveys (CTDA-executed and contract).
- c. Sample surveys of households.
- d. Observational micro-studies.
- e. Geological, agricultural, technical specialized surveys.
- f. Aerial photography and mapping (GOT funded).

3. The methodology of the CTED evaluation process will be an analysis of secular change in a very large number of selected indicators of social and economic change. This will include area-wide measurements and carefully designed and controlled sample evaluations.

The intensity of GOT and A.I.D. investments in such a limited geographic area will permit extensive regression analysis of data series and the application of causal and factor analysis techniques unusual in A.I.D. evaluations. The evaluation will be conducted using data files at differing levels of analysis: national, regional, delegation, and secteur as well as market area files. This will permit discrimination at the micro-level between areas where sub-project is either neutral or negative.

Methodologically, this evaluation approach will be designed to look beyond the impact of the sub-projects themselves. In this case, the emphasis will be upon consistently maintained Delegation and secteur data. This will be extremely helpful in identifying and isolating intervening and external variance. Without these refinements, conventional forms of evaluation might be misleading. They might leave the impression that an intervention was successful and worth replicating elsewhere when, in fact, an opposite conclusion might be true. The tighter methodologies to be utilized here, therefore, may contribute to better exercise of judgment concerning the replicability potentials of specific interventions.

With reference to the management-related evaluation activities of this project, the emphasis will be upon periodic examination (12-month intervals) by A.I.D. of just how the internal A.I.D. staffing, organizational, and monitoring systems are responding to the needs of the CTDA and CTED development. Similarly, the same periodic checks will be addressed to observation of the operation of the contractor-controlled support staffs. In both cases, the intent will be to evaluate the

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integrity of the original design, performance, and to suggest essential changes, where necessary.

Scheduling points for both the non-managerial and management evaluation operations are given in Section VI below: Administrative Feasibility and Implementation Plan.

V. FINANCIAL PLAN

Each sub-project will contain a Financial Plan.

VI. ADMINISTRATIVE FEASIBILITY AND IMPLEMENTATION PLAN

General

CTRD is a GOT/Contractor implemented project. Tunisian and U.S. funding are channeled through a single agency - - the Central Tunisia Development Agency (CTDA). The CTDA (described in detail in Section II above) will be at the center of all project operations. It will be the agency making the host country contracts with U.S. institutions supplying technical assistance. It will make the contracts with Tunisian entrepreneurs and agencies for physical works in CTRD. It will be the counterpart agency to USAID in the project.

The administrative feasibility/implementation analysis of the Project Paper¹ created under four subheadings:

- CTDA Role
- Contractor Role
- USAID Support Structure
- Implementation Schedule

A. CTDA Role

The CTDA is the project manager. In the French system, it is the "maitre d'oeuvre" for all work under the project performed by private contractors, entrepreneurs or other GOT agencies. The CTDA is legally constituted with powers to contract and to receive, hold and disburse funds.

The first administrative responsibilities of the CTDA in this project will include their execution of a host country contract with a U.S. land/grant institution for the provision of technical services under the Drylands and Irrigation sub-projects. It will conduct competitive bidding procedures (with assistance from USAID) to award the contract.

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Those elements of the contract which require the provision of goods and services to the contractor from the host country will be the responsibility of the CTDA.

The CTDA will assume management, control and maintenance responsibilities for all equipment procured under this project. Vehicles, for example, will be titled to the CTDA and maintained by them. Contractor office space will similarly be provided by the CTDA.

The respective responsibilities of CTDA, U.S. contractors and USAID will be detailed in the initial Project Agreement. Among other things, this Project Agreement will provide that all future U.S. investments in the program will be made through the CTDA, although execution of work in these sub-projects may well be sub-contracted by CTDA to other agencies of the GOT. The CTDA will assume executive responsibility for meeting the terms of loan components of the project and will approve and supervise designs and implementation of loan-funded construction. CTDA will also sit on the credit committee who will handle all agricultural re-lending of U.S. funds to farmers in the Central Tunisia area.

3. Contractor Role

Recognizing the planned phase-down of USAID staff in Tunisia as well as the projection of project activity beyond FY 81, the CTDA project is designed for contractor implementation to the fullest extent possible.

Two types of contracting will be used in the three sub-projects of CTDA currently submitted:

1. Host Country Contracting

A single host country contract will be let for technical services from an American Land Grant University to provide all the consulting services (long and short-term) and all the participant training (all short-term) required for both the Drylands and Irrigation sub-projects. Inasmuch as the Drylands sub-project is a fully technical assistance activity, and the Irrigation sub-project is largely capital with some water management, the responsiveness of the contractor on the Drylands scope of work will be the predominate criteria for selection (although contractor must be responsive on both components). The CTDA will handle the contracting and USAID staff, supported by the regional legal advisor located in Tunis, will assist GOT in host country contracting procedures. Logistical and administrative support to the contractor will be provided by GOT and by the administrative support unit to be contracted under (2) below.

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2. Cooperative Agreements

The CTED project will, in the first three sub-projects, utilize two existing contractual arrangements which A.I.D. has with two American universities. These are co-operative agreements and follow-up arrangements negotiated by the Development Support Bureau (DSB) of A.I.D. They are managed by the Office of Rural Development and Development Administration (DSB/RAD), AID/Washington.

These two institutions are the University of Wisconsin and Cornell University. The University of Wisconsin supplies regional planning technical skills to A.I.D. through the DSB/RAD. The Cornell University supplies local participation and related skills to A.I.D. through the DSB/RAD.

In the case of Tunisia, the Wisconsin and Cornell agreements will be amended so as to detail the technical services that are to be purchased under the sub-projects for use in the CTED project. Wisconsin will supply regional planning and agricultural planning long-term resident staff as well as short-term technical assistance. Cornell will supply short-term technical assistance in data management, analysis, and evaluation systems. (See sub-projects on Small Farmer Irrigation and Drylands Research).

The Wisconsin agreement will be further amended to insure that the long-term Wisconsin-supplied resident advisors will operate a logistical and administrative support unit (2 Tunisian sub-professionals and 1 Secretary). This unit, largely based at CTED Headquarters in Kasserine, will service the administrative and logistic requirements of A.I.D. - provided long-term and short-term technical assistance for the Drylands Research and Irrigation sub-projects, as well as Area Development Planning. (See sub-project on Area Development).

In particular, the unit will handle all the local and international communications, cabling, travel, per diem computations, scheduling, etc., required by both long-term and short-term consultants. It will handle field bookkeeping for the contractors and prepare such financial documentation as may be required by the OCT and US ID.

The unit's operations will be designed to fully eliminate the use of USAID channels for cables, typing services, travel arrangements, logistical support, and in-country transport. It will also insure that contractor implementation actions do not flow through ID/W or USAID, but are handled directly between the field contractor and his institutional backstop at the contracting university. Finally, operation of the unit should be designed so that the CTDA is provided with a developed

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model for on-going consultant and contractor logistical and administrative support after FY 81.

Procurement actions of a routine nature for technical equipment will be handled by the contractors, wherever feasible. However, two initial major procurement actions will be processed through A.I.D. channels in view of the need for early timely implementation.

a. The four new sedans (U.S.-made VW diesels) will be A.I.D. procured in order that they will be in place at about the time of contractor arrival in-country. Also, USAID will make arrangements for the transfer of all four of the Land Rovers, now assigned to the Siliana Rural Development Project, to the CTRD Project.

b. The procurement of the Drylands Research field testing equipment must be expedited by A.I.D.. Technical advice, already supplied by the Bolton-led project appraisal team of May 1978, lists the details of such needs and indicates that some very long lead-times must be anticipated on procurement of certain items. There is an absolute necessity to have such equipment in country prior to the cereals planting season of October 1980. This means only 21 months from January 1979. Hence, the need to speed early procurement of such equipment.

Subsequent procurement actions and all small equipment for the water management technical assistance will be taken by the contractors concerned. Cornell, for example, will procure the mini-computer, ancillary software and processing equipment. None of the equipment for the development of the irrigation infrastructure will require any A.I.D. or contractor procurement actions.

C. Mission Organization to Support the Overall CTRD Project

The heaviest share of the implementation responsibility for the project falls upon the CTRD and the host country contractors. The Mission role, although reduced by the participation of these other resources, is nevertheless substantial in the early stages of operation.

The support tasks for the mission are of three types:

1. Managerial

While at least three contractors and several sub-agencies of CTRD will be implementing individual interventions in the CTRD project, USAID is still the central manager. In this role, USAID is directly responsible for insuring coordination of the A.I.D.-financed inputs and for keeping the individual elements working harmoniously and effectively towards the overall goal.

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2. Financial

While considerable amounts of funding will be disposed of early in the project through host country contracts and A.I.D. procurement actions, there will remain a substantial amount of financial work for the USAID. There are components requiring fixed amount reimbursement, tranched funding of a credit relending mechanism, and the management of A.I.D. loans.

3. Technical

The CTFD project is not organized to "retail" technical assistance through A.I.D. direct-hire or PSC staff. The central responsibility for mounting and sustaining high quality professional technical services rests with the three host country contractors. Inevitably, however, the exercise of USAID's managerial and financial responsibilities will require recourse to in-house technical capabilities. The initial three sub-projects are within the technical span of the present USAID staff. Where the sub-projects may require technical advice upon which to base USAID managerial or financial action, this advice can be called upon from the technical staff in the Mission.

The following chart outlines the basic structure of Mission support for the CTFD Project. Central features of this arrangement are:

- a. Unified management.
- b. Shared financial authority.
- c. Technical advisory coordination responsibilities delegated by sub-project.

In light of the probability of a reduction in total U.S. staff at the USAID by FY 1961, the structure outlined below is intended to reflect the first 14 to 16 months of project operations. After this point, the financial policies should be well in place and the issues relating to loan implementation full resolved. The project will be contractor-managed from that point onward and should require the support of only one A.I.D. officer thereafter.

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MISSION SUPPORT STRUCTURE REQUIRED FOR MANAGEMENT OF CTRD

MISSION DIRECTOR

PROJECT MANAGER:

NOTE:

% = percent of staff time for direct support of CTRD

RDA OFFICE (100%) 2 DH professionals 1 FSN professional 1/2 local secretary
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FINANCIAL COMMITTEE:

RDA (100%) 2 DH professional 1 FSN professional 1/2 secretary	CONTROLLER (30%)* 2 DH professional 6 FSN professional 1 local secretary	CAPITAL (50%)- CRD 1 DH professional 1 FSN professional 1/2 secretary
--	---	--

* Controller load will increase w/new sub-projects in FY 80 & FY 81

TECHNICAL COORDINATING COMMITTEES:

AREA DEV Coordinator: RDA PROG, HEALTH, AGR, CRD	DRYLANDS SYSTEMS Coordinator: AGR RDA, PROG, CONT	IRRIGATION Coordinator: CRD RDA, PROG, AGR
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COMMITTEE RESPONSIBILITIES

PROJECT MANAGER

Under the guidance of the Director, the Project Manager makes all executive decisions regarding project operations. Handles all business and operational relations with contractors. Responsible for monitoring contractor & GOT compliance to project design & PP conditions & covenants. Handles all counterpart relations with the CTRD and MinPlan regarding the project. Directly responsible for all issues of contractor/GOT relationship including assisting GOT with host-country contracting process.

FINANCIAL COMMITTEE

Financial committee sets policies for financial issues relating to both GOT and contractors. Committee reviews and approves standards and procedures for USAID disbursements and periodically reviews overall financial management of the project. Supports the Controller in the execution of all his statutory duties regarding the project.

TECHNICAL COORDINATOR

Technical coordinators monitor the technical progress of their sub-projects and review the quarterly tech reports from contractors. At the direction of project manager, the coordinators make field inspections & undertake tech liaison w/contractors. Provide technical advice and analysis to support project management decisions. New technical coordinators will be added as new sub-projects are added.

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D. CTED PROJ CT

YEAR	MONTH	PP DEVELOPMENT	DEVELOPMENT	IRRIGATION
CTED-1 CY-1979	Jan	PP approved AID/W funded visit of Wisconsin/Cornell consultants.	PP approved	PP approved
	Feb	PRO/AG signed.	PRO/AG signed. Complete equip. specs.	PRO/AG signed.
	Mar	PIL No. 1	PIL No. 1	PIL No. 1
	Apr	Vehicles & equip. PIO/C's Initial Baseline Data Survey underway.	Research Equip. PIO/C's issued	
	May	Vehicles & Equip. PIO/C Wisconsin/Cornell Coop. Agreement amended.	CTDA/Le Kef Inst. agreement signed.	
	Jun	ETA Resident Advisor		
	Jul		AID/W initiates Proc research equip.	
	Sept	Computer Operations Siliana RD project vehicles transferred to CTDA 1st Ctr. training begins	Govt. confirms data collection and recruitment of applied research staff	
	Oct.	Initial survey data analysed 1st Experimental Project ready for implementation	Institute begins limited field trials	Surface wells credit prog. initiated. Land redistribution in PIP completed. CTDA awards PIP construction contract

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YEAR	MONTH	AREA DEVELOPMENT	TRAINING	IRRIGATION
CTRD-1 CY-1979			GOT/U.S. Univ Contract signed	GOT/U.S. Univ. contract signed.
	Nov	2nd Experimental Project ready for imple. (First state)		CTD capable distribute rapidly land certificates
	Dec.	2nd Qtr. training begins Vehicles & Equip. Received	AID/W initiates FY 80 funded procurement.	
CTRD-2 CY-1980	Feb.	1st Iteration regional plan	ETA Resident Advisor	Construction and equipping of irrigated areas continue, lending operations continue.
		3rd Qtr. training begins Last exp'l project ready for impl. (First state)		
	May		1st delivery res. equip. ST Training (1st group)	
	June- Aug.		Train. CTDA staff assigned to project	
	Sept.	Re-Iteration regional plan 4th training Qtr. begins	Research equip. received ET lab/equip. consultants 1st Pilot study area selected	
	Oct.	Intensive evaluation incl. evaluation of 1st state experience to projects.	Expand cereal testing/breeding soil fertility/ agron. trials on barley/wheat.	Water Mgmt. Phase I ends & Phase II planned.
	Nov		1st group part- icipants returns and group departs	Interim evaluation ST participants selected.

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YEAR	MONTH	AREA DEVELOPMENT	DAYS/LEADS	IRRIGATION
CTRD-3 CY-1981	Jan	2nd slate experimental projects ready for implementation		Construction and equipping of irrigated areas and lending operations continue.
	Feb	3rd iteration Regional plan		
	Mar Apr		Expand soil sampling throughout Project area	
	May		2nd group participants return	
	Jun July Aug	Full draft regional plan completed	Select barley/wheat varieties for multiplication and distribution.	
	Sept		2nd, 3rd pilot 2 study areas established.	
	Oct	Joint AID/AD team evaluation	1st Project evaluation	
	Nov	-	-	
		-	-	
		-	-	
CTRD-4 CY-1982	Jun Aug Sept	ETD Resident Team	Establishment of remaining five pilot study/demonstration areas by end of year.	(Cycle 2, Phase II) completed interim evaluation lending operations.
	Oct Nov Dec	Contract ends		
CTRD-5 CY-1983	Jan	-	2nd Project evaluation	Complete construction and equipping of irrigated perimeters and springs by end of year Interim evaluation lending oprs. consultants follow-up.
	Feb	-	ETD Resident Advisor	
	Mar	Final Evaluation Contract	Follow-up visits by short-term consultants to evaluate assist/redirect programs	
	Dec			

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YEAR	MONTH	AREA OF DEVELOPMENT	DEVELOPMENT	DEFINITION
CTPD-6 CT-1984	Feb	EOP Status	Phase out of T&S	Phase out T&S and lending
	Jun	Final Evaluation	Final Evaluation	Final Evaluation

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VII. CONDITIONS, COVENANTS, AND NEGOTIATING STATUS

The conditions precedent and the covenants to CTD are those that the Mission will negotiate with the GOT. The precise wording cannot be determined until the final negotiations; however, the regional legal officer will insure that the intent of each condition and covenant listed in the project document is fully adhered to.

Conditions and covenants applying to only one sub-project are listed in each sub-project document. Below are listed the conditions and covenants which will apply to the entire CTD project. All conditions and covenants will be contained in a single loan/grant agreement to be negotiated for the entire CTD project.

A. Conditions Precedent (to the entire project)

Prior to disbursement of any funds under the project the following conditions must be met.

1. A Decree has been issued which implements Law No. 78-44 of August 1, 1978 providing for establishment of CTD.

2. Satisfactory evidence is furnished that the GOT has provided sufficient funds in its 1979 budget to finance the first year investment, operating and maintenance costs of the CTD, including staffing, physical facilities, vehicles and office equipment and co-operating country project costs.

3. The CTD is physically established in Central Tunisia, adequately staffed and actually performing the functions assigned to it by Law No. 78-44 of August 1, 1978.

B. Project Covenants

1. All imported equipment financed by A.I.D. shall be granted an exemption from import or customs duties by the GOT and shall be titled to the CTD, which shall promptly clear such equipment through Tunisian customs and arrange for delivery to the project site within 15 days of customs clearance. The CTD shall further be responsible for all maintenance, insurance, registration or other similar costs in connection with such equipment.

2. The equipment provided under this agreement shall be restricted to use in the project area and only for purposes provided in the agreement, except as otherwise agreed by the parties.

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3. The CTDA will be responsible for logistical support of U.S. contract personnel within the project area, including office space, clerical support, transportation and housing for resident advisors.

4. Title to all equipment provided under the Siliana Rural Development project will be transferred to the CTDA upon or prior to termination of the Siliana Rural Development project on September 30, 1979.

5. The GOT agrees that, in carrying out the credit portions of this project; a) it will apply the same detailed procedures approved by A.I.D for the operation of the Small Farmer Supervised Credit project, including applicant selection and eligibility guidelines, credit analysis, loan processing and collection, monitoring and reporting systems and; b) it will apply the same interest rates for loans to farmers as under the Small Farmer Supervised Credit project and will revise interest rates to reflect any changes in the interest rates applied under the Small Farmer Supervised Credit project.

CTRD PROJECT PAPER LOG FRAME

ANNEX A

SECTOR GOALS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
<p>1. To develop cost-effective, managerially efficient, and resource-mobilizing project interventions for a portion of Central Tunisia so that, ultimately, those that are proven to be the best can be replicated in other geographic areas of Tunisia where conditions of similar marginality obtain in:</p> <ul style="list-style-type: none"> - Agriculture - Natural resource endowments - Transport and Communication - Preventive and Curative Health Services - Human Resources Development - Industrial and Marketing Development - Housing - Credit and Banking and - Local Participation 	<p>1. Selection of a defined geographic area at outset of project.</p> <p>2. By first three months of project creation of special GOT planning and implementation organizations and procedures responsible for project operations in the defined geographic area.</p> <p>3. By end-of-project development, test adoption of low-cost, population-extensive, equitable service and production project models fitted to interior region conditions and needs.</p> <p>4. By end of FY 1980 creation and operation of regional or area planning capacities which are linked to implementation responsibilities.</p>	<p>1. Adoption of specific geographic zones for attention.</p> <p>2. Presidential Decrees, Legislative enactments, Executive Orders creating special regionally-oriented GOT planning and implementation organizations</p> <p>3. Staffing and training of special, regionally-oriented, GOT institutions programmed to work on the development of new services and production models.</p> <p>4. Regional planning technical studies and analyses in production.</p> <p>5. Sample and informant surveys of CTRD population.</p>	<p>1. That a primary cause of the retarded condition of Tunisian interior regions lies in poor or non-adaptation of current technologies and GOT institutions to the conditions/needs of the regions.</p> <p>2. Revised, adapted, and new technologies planning institutions and operational systems can be designed and installed in the regions.</p> <p>3. Out-migration by itself is not for the present, a viable solution to the problems of the disadvantaged interior regions.</p> <p>4. The GOT is prepared to invest expanding levels of funds in regional institutional, services, and production activities.</p>
<p>2. To increase income, labor productivity, and improve the quality of life for the 200,000 rural Tunisians residing in the CTRD zone.</p>	<p>5. By end of FY 1979 development/test of indicators of improvement in CTRD population life including:</p> <ul style="list-style-type: none"> - income levels - labor productivity, employment and underemployment rates 		<p>5. What is proven to be cost-effective, efficient, and equitable will be replicated in other regions by the GOT.</p>
<p>3. To reduce regional disparities in income levels, quality of life, and access to basic services in Tunisia</p>	<ul style="list-style-type: none"> - housing condition indicators e.g. persons per room, % of houses with various facilities - morbidity indicators, e.g. average days sick per year, % of diseases caused by water-borne or malnutrition sources 		<p>6. Effective means can be found to foster forms of decentralization and local participation.</p>
<p>4. To reduce intra-regional disparities in income, quality of life, and access to basic services.</p>			

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SECTOR GOALS	EOPS & MEASURES	MEANS OF VERINICATION	ASSUMPTIONS
	<ul style="list-style-type: none"> - mortality indicators, e.g. crude death rates, infant and child mortality rates - nutrition indicators, e.g. % of population with various diseases of malnutrition, per capita intake of calories, proteins and other nutrients. 	<p>6. Sample surveys, national accounts, national surveys, ministry files.</p>	<p>7. High-quality, trained, GOT staff can be recruited and induced to work effectively in interior regions.</p>
	<p>6. By end of FY 1980 development/ test of measures of CTRD population experience vis-a-vis other regions, including:</p> <ul style="list-style-type: none"> - % improvement in living standard indicators (income levels, mortality and morbidity rates, etc) - Means of showing that changes experienced by CTRD population are at minimum equal to or greater than % of changes at other regional or at national levels. 		<p>8. AID emphasis upon improvement of institutional structure and performance and technological adaptation within the region can be so linked to GOT efforts as to produce a measurable impact upon the quality of life and productivity of the region.</p>
	<p>7. By end of FY 1980 development/ test of measures of CTRD population experience within various areas of the CTRD zone including:</p> <ul style="list-style-type: none"> - Rate of growth of income for lowest 40% of population in CTRD area equal to or greater than average rate for whole of CTRD region. - % of improvement in quality of life indicators for the lowest 40% equal to or greater than % of improvement in region as a whole. 	<p>7. Sample surveys, special studies, CTDA information system.</p>	<p>9. That the information and analysis systems adopted will quickly and effectively show the impact of interventions so that timely preparations for replication can be undertaken by the GOT.</p>

SECTOR GOALS	EOFS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
	<p>8. By end of FY 1979, adoption and operation of regionally-oriented information and evaluation systems which constantly examine:</p> <ul style="list-style-type: none"> - The socio-economic characteristics of the population, - The characteristics of the environment and agricultural systems, - The characteristics of infrastructural improvements and services provided, - Organizational efficiencies and beneficiary composition and distribution, and - Local participation and decentralization processes. <p>9. A series of sub-projects developed and operational in the area, by the end of FY 1980, which are measurably addressed to lower income rural population developmental needs in various portions of the CTRD region.</p>	<p>8. Sample surveys, National accounts, disaggregated by region</p> <p>Informant surveys</p> <p>Observational and efficiency studies.</p> <p>9. Project Agreements, Loan Agreements, Sub-project papers, technical and implementation reports from GOT agencies and foreign technical assistance long-term and short-term consultants/advisors. Also, special measures on sub-project performance/effects set up including:</p> <ul style="list-style-type: none"> - impact assessment - operational analysis - cost beneficiary analysis - regional and intra-regional disparity analysis - participation and decentralization analysis - <u>ex post facto</u> assessments. 	

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SECTOR GOALS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
	10. Programming of GOT and foreign donor/loan investments into regional activities on an accelerated basis over the 1979-84 period.	10. GOT special and "line" agency budgets; and loan and grant budgets of foreign donors.	

PURPOSE

This element is dealt with in the Logical Framework for each Sub-Project.

OUTPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
1. Regional planning and implementation agency (CTDA) beginning to be established in field.	200-plus individuals reassigned by July, 1979	Executive Order signed and senior management taking position.	1. Adequate initial staff, physical facilities, and organizational structure can be quickly assembled.
2. Regionally located GOT technical and managerial staff reassigned and reorganized within regional planning and implementation organization.	By July 1, 1979	Re-organization and transfer orders signed and staff beginning new tasks	2. Existing technical and managerial staff within various agencies in the region can be easily re-organized and redirected into new configurations of responsibility and methods of planning and implementation.
3. At least four problem-centered joint GOT and AID sub-projects operational in region.	By July 1, 1979	Pro-Ags and loans signed	3. Problem-centered joint GOT and USAID projects are focused on critical regional problems and adequate contractor performance has been insured through adherence to sound technical and managerial criteria.
4. GOT-supported initiatives in region taking place on scheduled basis in matters concerning rural roads, rural housing, forestry, conservation, etc. and fitted into regional plan framework.	Measurable change occurring by December 30, 1981.	GOT budget approved by National Assembly and funds being released to participating agencies	4. The GOT will be able to re-orient it's planned initiatives in the region towards needs and plans as gradually identified by the regional planning and implementation authority.
5. Increased income per capita in region so as to reduce the level of 40% of the population which can now spend no more than 60 Tunisian Dinars (FY 78 value) per year per person. (versus 18% in urban areas)		Base-line studies Information-gathering and data-analysis systems.	5. The totality of private development, GOT initiatives, and Joint GOT-USAID problem-centered projects in the region will begin to positively affect rural income levels by 1981.
			6. Potable water supply improvements, literacy rates, permanent housing rates, health systems efficiencies, skills training expansion, etc. will all be favorably affected in an upward direction by national development as a whole, private initiatives in the region, and GOT and foreign donor activities.

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OUTPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
6. Literacy rate raised from present 32% of regional population (as compared to literacy rate presently of 45% for Tunisia as a whole)	Measurable change occurring by December 30, 1981	Base-line studies Information-gathering and data analysis systems	7. Base-line study systems, information and data-gathering systems, and modes of analysis can all be organized and effectively operated on a region-and-zone-specific basis so that meaningful results are obtainable by December, 1981.
7. Present 1,850 inhabitants per paramedic in region lowered towards current national levels. (presently 587 per paramedic in Tunisia as a whole)	Measurable change occurring by December 30, 1981	Base-line studies Information-gathering and data analysis systems Ministry of Health records	
8. Present 75% rate of inhabitants in region not served by public tap or house connection water supply lowered towards current national levels, (presently 61% of population of Tunisia served by public water taps and house connections).	Measurable change occurring by December 30, 1981	Base-line studies Information-gathering and data analysis systems SONEDE records Genie Rural records	
9. Present 32% rate of temporary housing in region lowered towards current national levels. (Presently 25% in Tunisia as a whole.)	Measurable change occurring by December 30, 1981	Base-line studies Information-gathering and data analysis systems Governorate and Ministry of Housing records	

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INPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
1. GOT annual budget developmental funds for region	1979 - \$12,000,000 1980 - and 1981 - to be determined	Annual Budget	1. That the GOT and foreign donors will continue to be interested in programming increased funds into developmental efforts within the region.
2. GOT-Public 480 Title I programming for region	1979 - \$10,000,000 under negotiation by USAID 1980 - and 1981 - to be determined	PL 480 Agreement	2. That the regional planning and implementation authority can produce investment plans which gain GOT and foreign donor financial support.
3. GOT-support to US-financed development projects for region	1979 - \$4,140,000 1980 - and 1981 - to be determined	Annual Budget	3. That other "line" agencies of the GOT will support special developmental plans for the region.
4. USAID-financed inputs for region	1979 - \$5,192,000 1980 and 1981 - to be determined	Project Agreements and Loans	4. That the U.S. government will continue to display a willingness to focus funds and attention on the region.
5. Other donor inputs to the region	1979 - under negotiation by GOT 1980 - and 1981 to be determined	Grant and Loan Agreements	
6. Total of current planned inputs for 1979: GOT: \$18,190,000 USA: 8,000,000 PL 480: still under negotiation			

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ANNEXES to:

- Central Tunisia Rural Development Project Paper
- Central Tunisia Area Development Sub-Project Paper
- Small-Holder Irrigation Sub-Project Paper
- Dryland Farming Systems Research - Small-Holders -
Sub-Project Paper

ANNEXES TO CENTRAL TUNISIA RURAL DEVELOPMENT PROJECT PAPER

- Annex A - Log Frame (attached directly to Project Paper)
- Annex B - Description of Area
- Annex C - The Central Tunisia Rural Development Authority
- Annex D - CTRD Strategy Paper
- Annex E - Analyses of Credit and Land Titling Issues
- Annex F - An Information System for the CTDA
- Annex G - Statutory Check List
- Annex H - GOTT Request for Assistance
- Annex I - Draft Project Authorization and Request for Allotment of Funds
- Annex J - Mission Loan/Grant Agreement Statement
- Annex K - PID Approval Cable

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DESCRIPTION OF THE AREA

The CICA program area consists of eight delegations of central Tunisia (Maktar and Konia in Siliana Governorate; Thala, Djediane, Sofsa, Foussana and Sbeitla in Kasserine Governorate; and Sijilma in Sidi Bou Zid Governorate) that can best be described by the two words inland and upland. Elevations range from about 300 meters above sea level in the plains area around Sijilma to 1,344 meters at Djebel Orabi which is the highest of several long, rugged ranges (generally south-west-to-northeast through the project area; others are Djebel Soumane, Djebel Ghilil, and Djebel Sardi), all approximately the same elevation and constituting the easternmost extension of the Atlas Range of North Africa.

Through this generally mountainous terrain run a few broad valleys at elevations roughly between 300 and 700 meters. Most conspicuous of these is the long plain running south from Konia through Sofsa and to the vicinity of Sbeitla town, with a couple of miles over to Kasserine town in the west. In addition, there is a wide plain in which the town of Foussana is located, and much smaller plains interspersed among rugged peaks and scarps. The whole area has been heavily eroded and little is left of the original forest cover, although some reforestation is under way. The many gullies make travel slow and painful for the inhabitants. Waded roads, sticking to the main axes of communication, are few and the interior regions are accessible only by dirt track.

Annual rainfall varies from 320 mm. (70-year average) at Maktar in the north to 210 mm. at Sijilma, the amount decreasing both as one moves from north to south and from west to east. There appear to be sharp rainfall gradients due to localized rain-shadow effects. Summers are hot and dry, while winters are cold and occasionally humid. Winds are frequently strong in both seasons (the hot Sirocco from the south in summer, and the cold northwest wind in winter). Summer temperatures range in the 90-100° F. In many localities and winter temperatures in the 45°-50° F. Frosts as late as March and April are not uncommon in the high plateau areas such as around Thala. It snowed in Maktar on May 1, 1970. Hail is common, both in the autumn and spring months. The onset of the winter rains is highly variable from year to year, and farmers are dependent on this date to sow their grain crop. Conversely, rapidly rising daytime temperatures during May and June reduce the amount of moisture in the soil available to plants for grain production.

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Soil resources are maldistributed. Some of the valleys have high quality, well drained loam-silt soils, while others range from poor sandy to clay types. Similar differences are found in the plateau areas as well. Most of the sloping areas are characterized best as rocky and depleted. Salinity is a major problem in plains areas like Kohia. The prevalence of exposed bare rock, plus large areas of heavy clay, make absorption of rainfall poor and consequently high runoff occurs after major rainstorms.

Cropping patterns in the area assume a dichotomous form depending on whether or not one has access to water for irrigation. Dryland farmers follow the traditional grain (wheat or barley)/fallow rotation, grazing sheep and/or goats on the fallow. Fertilizer is extremely limited in the dryland areas, and cactus planting has been resorted to in order to provide dry-season forage. Throughout the area, the problem of overgrazing on rangelands cannot be overstated.

Although some of the richer farmers own or rent tractors, most power is furnished by draft animals--oxen, horses, mules, camels. Farm implements are usually made from wood, although metal sickles are used for harvesting grain. Grain yields average about 4.0 quintals per hectare except in very good years. No chemical fertilizers or herbicides are used by most farmers. Some arboriculture is found in the dryland areas as well, particularly olive, fig, apricot, and pistachio. In dryland farming operations, there is a division of labor between the sexes: men do the plowing in the autumn; women do the weeding (weeds are sacked and fed to livestock); but both men and women participate in the harvesting of grain. Children, of course, perform the essential task of tending flocks and herds in a country where there are no fences.

Another farming system exists in the project area. Along the banks of the Barak rivers where shallow well irrigation is possible, and in the few small irrigated perimeters, green vegetables and fruit trees flourish, and there is plenty of work to do year around; small trucks are used to carry the produce to market. In this irrigation economy, investments (and debts, too) are relatively high.

The human geography of the area centers on a population somewhat in excess of 200,000. The only towns of more than 1,000 inhabitants are Thala, Sebilla, Waktar, Sibba, Kohia, and Kesta, which among them do not count 30,000 inhabitants. The vast majority of the population

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live in stone houses dispersed here and there on the hillsides and along the narrow valleys. The first impression one has of the area is that it is extremely thinly settled. But the trained observer will learn to spot the stone houses almost blind in the scenery across the wide horizon, and he will discover that in traveling through the area he will rarely be out of sight of other human beings.

Water has to be carried to the house, usually on a daily basis, from the nearest spring or well, and the few purchased necessities (cooking oil, salt, sugar, tea, cigarettes, etc.) brought from the weekly market in one of the towns, or from the tiny one-room stores called "kiosks." Travel is mainly on donkey-back or on foot, although tractors can negotiate the up-and-down dirt tracks and often carry a load of people in a trailer to market or to see the clinic. The furnishings of the typical house are minimal, usually consisting of nothing more than a mat or reed mat for sleeping, on the floor or sitting, a "kangon" for cooking with charcoal, and a few pots and pans. Wealthier houses may have a cupboard for storing possessions. The offices of the clinics, also consisting of a single room, have a wooden table and a chair or two. Walls are absolutely bare except for possibly a calendar. Sometimes an old shot gun or rifle is slung on a pole. There are no windows, or at most one small one, the inside of the house gives a dark aspect. There is no plumbing. The walls are the only protection against the bitter winter wind. In summer they keep the inside of the house cool on the hottest day.

The wealth of the people consists entirely of their house, their animals (chickens and turkeys in the yard; sheep, goats and possibly some cattle, plus feral animals, in the fields), and of course their land. Ownership of land is surprisingly equitable, although titles to land are still a rarity, and disputes over property boundaries occupy a considerable part of the land's time. Land is very rarely sold, but instead is kept in the family or clan. At the death of an elder, it is subdivided by verbal agreement.

Even in the most remote parts of the project area there are schools. Most have one or two rooms, and one or two schoolteachers per school. These are young men who must complete two years of service in rural areas upon graduating from their teacher training course. They live isolated lives during these two years, getting home only on the two or three long holidays during the year. The schools operate on a rotational basis, so the dirt tracks and pathways

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leading to and from the schools are people with small children, walking to or from their class, from early in the morning to late afternoon. In spite of such a system of dispersed schools and schoolteachers in service, the percentage of population aged 5 to 14 actually in school reaches 59 per cent in Sidi Bou Ziane, 54 per cent in Kasserine, and 48 per cent in Sidi Bou Sid. The teachers report that the main obstacle is families whose parents want to keep their children home to do useful work. The proportion of boys in school is still far higher than that of girls.

From the ethnolinguistic point of view, the project area now shares with the rest of the country the striking homogeneity that is Tunisia's. All of the population speaks Tunisian Arabic, albeit with minor local dialectal variations. In the towns, some people also speak French. Almost none speak English. The Arabic script used in Tunisia is the same as that used in the other Arabic-speaking countries; like elsewhere in North Africa, a specially punctuated character indicates the hard " " which is used in the Maghribian pronunciation. "Maghrib" names, however, are virtually always written in the French style, rather than in the Arabic script. Road signs, where they are posted (on main roads), are in both Arabic and French.

Except for a few foreigners, the entire population of the project area is Muslim, in the Sunni tradition, and of the Malikiite legal "school." The traditions of Islam are deeply embedded and form the matrix of the way of life to which the population adheres. On the most important Islamic holiday of the religious year, the *W'id el Kebir*, every family is called upon to slaughter a sheep. Ramadan is also strictly observed.

Also clearly Islamic are the shrines, called *zawabuts*, that dot the project area and that are sites of pilgrimage connected with veneration for a deceased holy man buried there. Many of these shrines have given their names to localities in the project area. They are also landmarks for Islam on the way around the project area because they are almost all marked on the shore 1:50,000 topographic maps used by cadres of the various economic services, and their whereabouts are familiar to the local inhabitants. One of the most important shrines, such as the one to Sidi *Abderrahman* on the eastern outskirts of *Konia*, serves as awana to a formal or informal association of adherents, a place of retreat as well as of pilgrimage.

THE CENTRAL TUNISIA DEVELOPMENT AUTHORITY

Overall responsibility for management and coordination of the Central Tunisia Rural Development (CTRD) program will rest with the recently created Central Tunisia Development Authority (CTDA) earlier described in Section II of this paper.

The enabling legislation, voted by the National Assembly in July 1976, is based on the recommendations of a 1974 CNRA/FAO study on Central Tunisia. It reflects the concerns of the authors of that report. That is, the new "Office" was viewed primarily at that time as an "implementer" of a previously agreed upon integrated project to be jointly financed by the BOT and the IFD. Thus the legislation contains relatively little about the role of the CTDA as a planner, experimenter, and innovator, it does insist on CTDA responsibility for the implementation of agricultural and infrastructural investment programs.

When the IFD financing did not materialize, a scaled down version of the Central Tunisia Project was initiated, in 1977 by the Office de Mise en Valeurs in the two pilot zones proposed in the 1974 CNRA/FAO study

The first pilot zone includes the delegations of Gbia and Foussana in Kasserine Governorate, which also are part of the proposed CTRD program area. The second pilot zone, located further south, includes the delegations of Maknassy in Sidi Bou Aid Governorate and Sned and North Gafsa in Gafsa Governorate. Subsequently, the six remaining delegations in the CTRD program area were included as a result of national assembly hearings conducted prior to adoption of the legislation (in any event, the legislation provides that the zone of operation time can be extended by decree).

In reply to questions raised during the hearings, BOT officials indicated that the CTDA would absorb practically all the agricultural development functions currently performed by the various agencies and field offices of the Ministry of Agriculture in the new zone of operation. This means that the CTDA will have staff and facilities assigned to the performance of functions such as:

a) The Kasserine regional branch office of the OMTM (its new office building in Kasserine will house the CTDA) as well as all irrigated perimeters in the zone of operation.

b) The dryland agricultural extension and credit activities of the Ministry of Agricultural Production Division as well as the WFP program of assistance to fruit tree cooperatives.

c) The Agricultural Engineer Service (Génie Rural) staff in each delegation of the zone.

d) The range management and land and water conservation responsibilities of the Forestry Service, but only outside the state forests and to the extent that the new "Office" develops an action capability in those fields of intervention.

e) The functions and staff of the Central Tunisia Project section of the Kasserine field office of the Ministry of Agriculture Land Tenure division.

This transfer of functions, staff and facilities to the CTDA will not, in and by itself, increase the level of technical manpower resources available in the CTDA project area. It will simply mean that the "Authority" will take over both the coordinating role of the Governorate-level regional commissioners for Agricultural development (CRD's) and the supervisory role of the various technical divisions of the Ministry of Agriculture vis-à-vis their field offices. This will mean a transfer of authority from Tunis to the project area-based authority and, hopefully, a concomitant increase in efficiency. It also will mean that technical manpower previously restricted to public irrigated perimeters can be used in dryland areas (for instance, to assist owners of surface-well irrigated holdings). The CTDA, will be expected to build up its staff so as to reduce the current gap in extension, credit and other agricultural support services between irrigated and dryland areas. COT officials have indicated that they do not anticipate difficulties in recruiting lower level (sub-professional) staff to work in the CTDA areas, since an increasing number of people originating from the area can be found among graduates of agricultural high school and junior college-level institutions.

It is recognized that it might be more difficult to induce professional cadres to go and live in Kasserine. It is expected, however, that young, ambitious and motivated individuals will be attracted by the opportunities for professionally challenging work and by the financial incentives and perquisites which a "Class A" level "Office" like the CTDA, can offer (as compared to regular government ministries and agencies). In any case, the CTDA is not expected to duplicate the full range of technical expertise existing in the Ministry of Agriculture since it will have priority access to that expertise. It will also retain the option of contracting to other agricultural agencies tasks

which it is not yet staffed to carry out (for instance, range management interventions could be contracted out to the Livestock and Rangeland Authority (OPE) just as dryland applied research will be contracted out to Le Kef Institute).

In addition to its agricultural development functions, the CTDA will be responsible for overseeing (as the "Maitre d'Oeuvre") all rural infrastructure projects in its area of operation. This means that these interventions would be funded through the CTDA which would contract with public entities or private enterprises for their execution. Again, the GOT hopes that by decentralizing decision-making to the CTDA, it will avoid the bureaucratic delays that have plagued projects executed by technical ministries.

While the Authority, as originally conceived, was intended to handle only projects funded under the regular investment budget of the government, it is now expected to handle also projects funded under the GOT Rural Development Program (PDR). This is because the GOT (as well as USAID through its Siliana RD Project) have come to realize that the governorates in Central Tunisia cannot muster the managerial and technical staff resources to design and implement PDR-funded projects.

With regard to non-agricultural, non-infrastructure development activities (including both governmental and private sector activities, the CTDA is expected to act as a "promoter", coordinator and "facilitator". This is an area of intervention which is rather ill-defined in the enabling legislation, possibly rightly so as it will require organizationally innovative behavior on the part of the Authority. (Fortunately, the legislation provides that the broadly defined functions of the Authority can be amended by simple decrees).

In some instances, the Authority may provide extension-type services (e.g. to small business) or facilitate access to capital finance (e.g. FOPRODI credit for small industry) or public services. The proposed establishment of the Area Development Experimental Fund, however, would permit the CTDA to play a truly innovative role by helping design, fund and implement (in cooperation with other agencies and possibly the private sector) experimental interventions which would test new modes of interagency cooperation in the delivery of public services. The AID decision to fund all CTDA interventions (for instance, in the field of health and nutrition) through the Authority will further strengthen the position of the CTDA in developing working relationship with non-agricultural agencies operating in Central Tunisia.

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ANNEX D

CENTRAL TUNISIA RURAL DEVELOPMENT

CTRD STRATEGY PAPER

I. INTRODUCTION

Beginning in July 1977, USAID engaged in an intense dialogue with the GOT concerning new directions for U.S. assistance to Tunisia. By the end of September 1977, the GOT and USAID had reached tentative agreement on an integrated rural development program in Central Tunisia as the best way to focus U.S. assistance to Tunisia on meeting the basic needs of the rural poor. This agreement was confirmed by USAID in late October of a Central Tunisia rural development (CTRD) draft Concept Paper and its qualified acceptance by USAID in late November 1977, plans were developed for assessment of the agricultural development potential of the proposed CTRD program area. Concurrently, a new phase of the GOT/USAID dialogue was initiated concerning the program planning and management aspects of the CTRD program with particular reference to the program goals of the creation of a CTRD authority.

The CTRD Agricultural Assessment prepared by University of Minnesota contract team, together with a preliminary layout of strategy alternatives, prepared by Messrs. Galton and Jackson, IDA, provided the analytical base for the next phase of CTRD program development, which involved the formulation of a joint USAID/GOT development strategy for the CTRD program area, the preliminary identification of projects to be undertaken in the first year 1978 and the development of USAID budget estimates for the first year tranche of the CTRD program.

Although general agreement had been reached by early March 1978 concerning the parameters of USAID/GOT collaboration on the above tasks, the actual establishment of a USAID/GOT Joint Committee for CTRD did not take place until May 5, 1978 and it was not until May 18 that a USAID-financed contract was signed between the Ministry of Plan and the National Center for Agricultural Studies (CNAS) for the preparation of a background paper in support of a joint CTRD strategy. Despite these administrative delays, however, a joint USAID/GOT CTRD strategy (see Part III) and a combined GOT/USAID first year budget (see table next page) were completed and approved by the Joint Committee in early July 1978. On the basis of these documents and recommendations submitted by a Second Phase Agricultural Assessment Team, work was started on four FY 1979 EID's for submission to AID/W by July 30, 1978.

II. U.S. ASSISTANCE STRATEGY

The major thrust of U.S. assistance strategy in Central Tunisia is to help the GOT improve the efficiency and effectiveness of its efforts to bring about social and economic development in that long-neglected, poor and backward part of Tunisia. From the outset, it has been clear to us that any U.S. assistance input into the development of Central Tunisia should be strictly complementary to the GOT's own effort. An encouraging sign in that respect was the fact that in 1977, the GOT undertook, with its own resources, the Central Tunisia project which the IBRD had declined to finance three years earlier. As a matter of fact, because it viewed the project as its brainchild, the GOT Ministry of Plan for a long time resisted our efforts to modify its basic approach to the development of Central Tunisia. While it has now accepted the principle of GOT/U.S. collaboration in program development, the GOT still insists rightly that it is primarily a Tunisian effort which began before U.S. assistance was even considered and will continue long after U.S. assistance is terminated.

Until fairly recently, it could not be claimed that the development of Central Tunisia was high on the GOT priority list. In recent months, however, there has been growing political pressure to reduce the wide gap in income and living conditions between the Northern and coastal areas on the one hand, and the interior on the other. It was this political pressure, together with the realization that neither the governorate-based Rural Development program nor the Tunis-based Medjerda Valley Development Authority (OMVVM) responsible for the on-going Central Tunisia project, could have a significant impact on the area, which led to the recent GOT decision to establish the Central Tunisia Development Authority (and not the anticipation of U.S. assistance, as the timing might suggest).

While the creation of the CTRD should be seen primarily as politically motivated, it has important implications for U.S. assistance strategy in Central Tunisia. First, it constitutes a clear expression of GOT political commitment to the development of Central Tunisia, while at the same time providing an institutional mechanism for channeling the resources needed to back up that commitment. Secondly, it provides USAID not only with a more efficient institutional mechanism for channeling U.S. assistance to the area (as compared to the Rural Development program channel utilized in Siliana), but also with a possibility of exerting some influence on the direction, content and beneficiary impact of the CTRD program.

Some undoubtedly will deplore the fact that the early GOT decision to establish the CTDA will preclude consideration of alternative institutional/administrative arrangements for management of the CTRD program. The early

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establishment of the CTDA, however, will ensure that the program management structures will be in place by the time the first tranche is ready for implementation. He also sees in a positive light the fact that the CTDA was not created in response to U.S. program management concerns (this is evident from the fact that the draft legislation approved by the GPT Council of Ministers and submitted to the National Assembly was based on the on-going Central Tunisia Project and included the area of operation of the CTDA to only six delegations, of which only two are located in the proposed CTDA program area). However, as a result of hearings, conducted by the appropriate committee of the National Assembly, the CTDA's area of operation has been expanded to include the other six delegations of the CTDA program area. The fact that the CTDA is being established prior to, and independently from, U.S. funding approval for a CTDA program is the best guaranty that the author of will continue to operate after U.S. assistance is terminated.

It is not intended that U.S. assistance provide massive budgetary and manpower support for the CTDA authority. On the contrary, the U.S. assistance to be provided to the Authority will be limited in scope and duration and aimed at enabling the new agency to operate efficiently and effectively after an initial "breathing-in" period. The basic aim of U.S. assistance strategy in Central Tunisia is to provide an initial impetus to the CTDA program without as any time substituting U.S. resources for GPT resources or fostering GPT dependence on U.S. technical and/or financial assistance (the termination of which might cause the entire effort to collapse). More specifically, U.S. assistance strategy in Central Tunisia will attempt to accomplish the following:

1. Stimulate the GPT into undertaking a "minimum critical effort" in Central Tunisia. The GPT has not had much initial success on this score as the GPT has agreed to complement with slightly over 1 million of its own budgetary resources 10 million of development assistance and 10 million of P.L. 480 Title I counterpart which have been tentatively earmarked for the first (FY 1979) tranche of the CTDA program.

2. Encourage and assist the GPT to undertake low cost, post-effective delivery systems for public goods and services which can be replicated by the GPT in other parts of Central Tunisia. Thus possible water, health, and other U.S.-assisted interventions will include a technical assistance component aimed at making the GPT aware of lower cost alternative systems and at training GPT officials in cost-effectiveness analysis techniques.

3. Encourage and assist the GPT to address the problems of small dryland farmers who constitute, and always will constitute, the vast majority of small farmers. Thus the U.S.-assisted applied research to be undertaken shortly will lay the basis for a major increase in the productivity of small farmers.

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D. Encourage local participation in decision-making, for instance by further involving the governors and "delegates" (district administrators) into area development planning process and by organizing training programs for member of (delegation-level) local committees.

E. Increase the participation of other donors either through the provision of technical assistance or through the financing of selected components of the integrated CTD program.

F. Encourage and assist the CTD in its effort to achieve better integration of rural development interventions. One first step has been taken with the inclusion of both national and local (non-government) funds and "Rural Development Program" (governorate) funds in the combined GOF/USAID CTD budget for FY 1971. This year development of main assistance, however, will only be possible once a framework by fostering a planning methodology which will address rural development problems in systemic terms, for instance, by approaching off-farm employment generation/small industry development within the context of rural area/small market center linkages or by viewing dryland farming, range management and land/water conservation as interrelated elements of a natural resource management system.

The central core of USAID assistance to the CTD program will be aimed at building up an area development planning and evaluation capability within the CTD. This project, funded over three years, also will include funding for pilot rural development interventions on a scale which does not justify subjecting them to the full-blown A.I.D. project review and approval process.

Major rural financial interventions will be submitted for review and approval of donor projects, but will be justified and interrelated, mutually supportive components of an integrated CTD program. Major interventions in small farmer dryland and irrigated agriculture, range and water wildlife management, CTD interventions in small industry development, range management and integrated primary health care facilities and nutrition education family planning will be introduced in FY 72 either as pilot interventions or full-blown projects. It is expected that the CTD's planning will be assisted by experts working under a grant from the Development Support Bureau-Jordan, and a 3-year "cooperative agreement" with a U.S. university, which eventually assume project design as well as overall CTD program planning responsibility. Hence, however, advisory services and training provided under the Area Development project will be focussed primarily on program planning, analysis and evaluation. Additional operationally oriented and project-specific technical assistance will be separately funded for each major intervention. However, except for a long-term area development advisor/contract manager located at the CTD in Kasserine and a long-term dryland agronomist/contract manager located at the Dryland Crop Institute in Jerf, all advisory services will be provided on a short-term basis even if this requires recurring visits by

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some experts at different stages of project implementation. Participant training also will be critical to the success of the program, preferably not in excess of six months. Local extension staff will also be kept to a minimum of assistance and will be made of local corps volunteers in monitoring project implementation.

On the surface, it could be argued that Tunisia would not need major interventions in the CTRD program until such time as the GDP, with A.I.D. assistance, has had the time to formulate an integrated area development strategy. The political reality is, however, that the GOF cannot wait several years for an area development planning capability to be built-up within the CTRD. For a number of major interventions. Besides, there are obvious areas of intervention in agriculture, irrigation, potable water, and health care which require immediate attention. The effectiveness of these interventions, particularly in agriculture, depends on the effectiveness of these interventions. In agriculture, there are areas, such as dryland cereals production, where major increases in productivity can be achieved only after adapted varieties and cultural practices have been tested under field conditions (i.e., on small farms in Tunisia). It could be pointed out that our success in securing the material to supporting major applied research in Tunisia is as well as the support of national Tunisia, which is available to the CTRD. We are willing to consider other major interventions in the areas of irrigation and potable water which are of high priority by the GOF. Finally, it should be noted that A.I.D. influence on the process of area development planning and CTRD resource allocation is very much a function of our initial willingness to support major interventions in the CTRD program area.

We recognize of course that we are in the area development strategy jointly developed by the GOF and A.I.D. and outlined in Part III of this paper. Our assessment of the development problems and constraints of the CTRD program area. It is only a working document, to be modified and, if necessary, radically revised as more information becomes available and more analytical work is completed on various aspects of the CTRD program.

III. PROGRAM OBJECTIVES AND GOALS

The objectives of the Central Tunisia Rural Development (CTRDR) program have been identified in an earlier paper⁴ as follows:

- A. Increase income and employment and other wise improve the quality of life for over 200,000 predominantly rural and poor Tunisians.
- B. Experiment with approaches and techniques of regional planning and rural development program design, management and evaluation which could

⁴ Draft Concept Paper, October 1977.

be applied to other areas in Central Tunisia.

C. Train the personnel of the Central Tunisia Development Authority (CTDA), as well as other governmental and non-governmental technical personnel working in the program zone, in a variety of skills relevant to rural development (e.g., project planning and evaluation, agricultural extension, health education, etc.).

Since these objectives were formulated in October of last year, progress has been made in reviewing and analyzing the considerable body of information available on Central Tunisia. U.S. consultants (notably a University of Missouri team) have collaborated with the GOT National Center for Agricultural studies (CNEA) to further identify the agricultural development potential of the proposed program area as well as the constraints which have hindered the development of Central Tunisia. Both the availability of large volume of information and the complexity of the problems identified, however, make it difficult to formulate a definitive strategy which simultaneously addresses all of these problems and their inter-relationships. While a systemic approach is needed to solve some of the more intractable problems (for instance, in the livestock and range management areas), we believe that it is possible to address some of the problems now through action programs funded in FY 1979 while continuing the analysis of more complex problems. The advantage of such a sequential problem solving approach is that it need not delay the design and implementation of priority interventions on which there is general agreement.

On the basis of the studies completed to-date, an integrated development strategy for the CTRD program area should be based on the following considerations:

1. The population of the proposed program area is predominantly rural and poor, and an overwhelming majority is engaged in agriculture.

2. The current system of dryland agricultural production is unstable and is bringing about a steady deterioration of the natural environment and of the quality of life for the rural population of Central Tunisia.

3. Past experience indicates that discrete technological interventions in dryland agriculture (deferred grazing, land conservation, improved cereal varieties, etc.) cannot begin to address a complex agricultural, ecological and human problem unless they are part of an integrated, systemic approach.

4. As the population pressure on the land has increased, a growing proportion of the population (at least one-half of the small farmers) is deriving the major portion of its income from non-agricultural sources (primarily remittances from migrant laborers).

5. There are a number of small peasants who own almost no land or such marginal land that they will not benefit from any conceivable agricultural interventions. This segment of the rural population (estimated at over 20 percent) includes many of the region's poorest people, located on small eroded, parcels of land often in highly inaccessible areas.

6. Groundwater appears to be the only underutilized natural resource in the program area. It appears that, in a number of instances, water from existing area and surface wells is not utilized or underutilized.

7. The rural population of the program area suffers from inadequate access to public goods and services as well as from insufficient income.

Local officials claim (and the recently completed study of the Hababsa secteur confirms) that the rural population perceives road transportation and potable water as its priority needs.

In light of the above, a development strategy aimed at meeting basic human needs in the proposed area should be shaped along the following lines:

a. A careful balance should be maintained between, on the one hand, investment in employment generating/income producing activities and on the other hand, investment in social infrastructure. This is self-evident from the fact that a resident population already so dependent on remittances from outside the region desperately need any supplementary income which would result from productivity increases or additional employment.

b. While agricultural development should be given the highest priority in any development strategy for the proposed program area, special attention should be given to possible means of increasing non-agricultural employment and income. These efforts should be targeted particularly on the landless, or near landless, section of the rural population.

c. Within the agricultural sector, a high priority should be assigned to increasing the use of water for irrigation, and the efficiency of water use, as well as the number of small farmers which have access to and make efficient use of irrigation water.

d. An equally high priority should be assigned, however, to initiating pilot interventions aimed at improving the productivity of dryland farming and livestock production in the program area. In contrast to irrigated agriculture, dryland agriculture does not provide much scope for large productive investments in the immediate future. What is required initially is the development of integrated crop production and livestock production systems suitable to the natural and human ecology of the area and consistent with effective land and water conservation practices. (It is suspected that such systems may not be viable without the creation of

strong linkages between irrigated agriculture dryland farming and live-stock production).

e. Within the general area of public goods and services, a high priority should be assigned to potable water (and complementary health education inputs) because of its importance to health and welfare, the burden imposed on women and children by the necessity to carry water over a long distance and the high value attached to potable water availability by the rural population itself.

It has been argued that the assignment of a high priority to increased and improved use of groundwater for irrigation might run counter to consideration of equity in allocating investment resources. Improved use of irrigation water in existing perimeters, for instance, would raise the income of small farmers on irrigated land and therefore increase the income gap between them and small farmers on dryland.

While this might happen, of course, as a result of the adoption of improved practices, it is anticipated that the bulk of USAID funds would be spent on extending the area under irrigation with the objective of converting the greatest possible number of farmers from dryland to irrigated agriculture. It can be argued, of course, that only a very small percentage of dryland farmers will benefit from these interventions. This argument however, can be countered as follows:

(1) It does not make any sense to deny assistance to small farmers who can make effective use of this assistance on the ground that all small farmers do not have equal opportunity to benefit from irrigation.

(2) Given existing technological and institutional constraints, the resources which can be used over the next few years to extend irrigated agriculture cannot be absorbed over a comparable time span by a program aimed at raising the productivity of dryland agriculture. It is essential however, that early action be taken to remove these constraints, while recognizing that this will be a difficult and slow process.

(3) As stated earlier, there is a substantial fraction of the rural population which cannot benefit directly from any agricultural development interventions. This segment of the population, however, can benefit indirectly through increased employment in processing industries and in the new complex of supporting services which will follow the development of irrigated agriculture. The growth of this non-agricultural production and services sector should be strongly encouraged by appropriate technical and financial assistance.

Temporary employment, of course, also can be generated through labor-intensive investment projects such as land and water conservation schemes (e.g., construction of rock dams and terraces), improvement of rural roads, construction of housing, wells and other rural infrastructure. Such programs can be (and have been) combined with skills training (e.g., of masons and builders in Kasserine province). It should be recognized, however, that while rural housewives may accept low-pay employment at, or close to, home (e.g., in cottage industry or handicraft), male unskilled labor in Central Tunisia is very mobile and responsive to alternative employment opportunities elsewhere in Tunisia and even abroad. Nevertheless, the PAM (World Food Program) project in Central Tunisia has indicated clearly the existence of a labor surplus which can be mobilized through a combination of food and cash wage payments. It is essential, however, to maintain a balance between the creation of permanent jobs and temporary employment generation, as well as between investment in income-producing activities and infrastructure projects. While labor-intensive technologist will be encouraged to the extent possible, there are no plans to undertake public works programs aimed primarily at relieving unemployment or under-employment.

In short, the CTRD development strategy emphasizes "productivity with equity" and proposes a program mix in which production and income-generating components are counterbalanced by programs aimed at providing basic public goods and services to the poorest elements of the rural population. At the same time, as stated earlier, the first round of resource allocation will focus on the least complex development problems (from a technological or institutional standpoint), while research and analytical efforts continue to be directed at the more complex development problems.

In line with this strategy, the initial focus of the CTRD program will be the development of water resources for human and livestock consumption and for irrigation. The CTRD program, however, will be an integrated, multi-sectoral program which will involve a full range of interventions in agriculture, small industry, potable water, rural infrastructure (roads, electrifications, etc.) rural housing, health, skills training and social services. In fact, the CTRD program will absorb two existing "integrated projects": (1) the "Central Tunisia Project" and (2) the Siliana cluster of rural development projects. The "Central Tunisia Project" is a scaled-down version of the project originally proposed to the IBRD for financing in 1974. Prior to the creation of the Central Tunisia Development Authority (CTDA), implementation of this project, primarily concerned with irrigated agriculture, was the responsibility of the Public Irrigated Perimeter Division of the Medjerda Valley Development Authority (OMVVM). Interventions programmed for Zone I of the project, which is located in Kasserine Governorate and within the CTRD program zone, will be integrated within the new CTRD program beginning with the CY 1979 GOT budget. Similarly, GOT funds programmed for the cluster of rural development projects assisted by A.I.D.

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in Makthar and Rohia delegations of Siliana Governorate will be integrated within the CTRD program from CY 1978 onward.

The first year tranche of the CTRD program, estimated at \$37 million, is expected to be broken down as follows:

Irrigated agriculture	6
Dryland agriculture, livestock-forestry	6
Potable water	5
Rural housing	4
Rural infrastructure	7
Health and social affairs	2
Others rural development	7
	<hr/>
Total	\$ 37 million

A.I.D. Development Assistance funds have been tentatively committed to support the following components of the CTRD integrated program:

(a) A production component aimed at increasing small farmers access to irrigation water. It would seem that efforts aimed at accelerating the development of private wells would require the least administrative support from the Government as it would rely primarily on market forces. On the other hand, there are strong arguments in favor of making more effective use of the already considerable Government investment in deep wells, many of which are not yet equipped.

(b) A potable water component aimed at improving the rural population access to drinking water and reducing the high level of diseases related to unsafe drinking water. The program will involve three separate levels of interventions: (1) rehabilitation of existing wells and cisterns; (2) construction of new wells and pipelines linking the wells to villages; and (3) construction or expansion of small potable water systems in small urban communities. Potable water interventions in rural areas will be complemented by a health education program.

(c) An applied agricultural research component aimed at adapting, testing and evaluating in Central Tunisia existing technology for semi-arid cultivation of barley, other cereals and forage crops. This research, together with parallel analysis of alternative small farm systems will lay the foundation for future action programs aimed at improving small farmer productivity as well as restoring ecological balance in Central Tunisia.

(d) A modest rural area development component which will provide advisory services and training in the areas of public services and rural infrastructure planning, natural resources management, and market development. Advisory services would be provided to assist planning personnel in the CTDA to analyze complex development problems requiring a

"systems approach" such as the planning of integrated livestock/pasture improvement/irrigated forage production systems or marketing/ storage/ transportation systems. Short-term consultants also would be made available, as needed, to assist in the design and implementation of the Authority small industry development program and other rural development interventions. Training would include both short-term training abroad of the CTDA planning staff and in-country training of personnel from the various regional field offices of operating ministries, governorate personnel and other members of the regional and local councils which will advise the Authority in program planning and assist in program implementation.

It is anticipated that additional U.S. aid funds will be committed in FY 1980 and 1981 to the continuation and expansion of the programs initiated in FY 1979. The level of resources, however, will depend on the effectiveness and speed of utilization of funds obligated in FY 1979. It is expected also that other categories of interventions will be funded on the basis of studies and plans developed during the remainder of 1978 and in 1979. Areas of interventions being considered include range management and livestock improvement, soil and water conservation, demonstration of integrated dryland farming systems (based on the result of applied research funded in FY 1979), development of small enterprises, skills training, improvement of marketing and transport systems, integration and improvement of outreach social services (particularly health, nutrition and family planning).

Some of these areas of interventions have been, or soon will be, studied by Tunisian and U.S. consultants (e.g., rural health, small industry development, skills training). Experimental work in pasture improvement has been initiated in the Siliana Rural Development project area in cooperation with the Office des Cereales, Forestry Service and U.S. livestock project technicians. The more complex problems and issues, however, will be studied and analyzed by CTDA planners with U.S. advisors or consultants who will be made available under the rural area development project. The mode of intervention and the level of resources to be committed will depend not only on the result of these studies and analyses, but also on the ability of the GOT to build up the necessary administrative and institutional framework.

Ultimately, the effectiveness of the CTRD program will be measured in terms of its success in increasing income and employment and in meeting other basic human needs in the program area. One should not lose sight, however, of the second and third order objectives of the program which are focused on the process of planning and managing rural development. Thus, it is most essential that the new Authority be built up into the kind of institution best suited to plan an integrated set of interventions cutting across all sectors and to manage or coordinate their implementation.

Most critical to the successful implementation of the CTRD program, however, will be the ability of the GOT to staff the Authority and other developmental institutions within the program area.

Legislation establishing the CTDA was approved by the National Assembly on July 31 and decrees setting forth the organization of the Authority and naming its chief executive are expected to be issued before the end of the year. In the meantime, the GOT and USAID will continue to study a number of issues relating to the role of the CTDA as a planner, manager and/or coordinator of development activities in the program area, including its relationships to the governorates concerned and to the regional services of the various GOT ministries and agencies and provisions for participation of local government authorities in the decision-making process.

The question of U.S. technical assistance requirements is closely related to the general issue of the role and staffing of the new Authority. It is planned that long-term technical assistance staff be kept to the absolute minimum and that maximum use be made of the resources provided under other projects, particularly long-term advisors provided under the Livestock Feed Production project and long-term academic training provided under the Agricultural Technology Transfer project. It is clear, however, that the latter cannot meet any of the short-term training needs of the CTRD program. As for advisory services, while efforts will be made to rely on recurring short-term consultations whenever feasible, use of long-term resident staff advisors, will not be ruled out, especially in instances when their absence would place an excessive project management burden on the Mission.

ANALYSES OF CREDIT AND LAND TITLING ISSUESI. CREDIT

A. USAID/Tunis proposes to establish a uniform credit mechanism for all medium-term farmer lending in the program. Such a mechanism will cover investments made within the framework of the irrigation, fruit tree production, and other projects in the program.

B. At the present time, there are a number of credit lines available for medium-term credit to farmers, at least on paper. These include the FOSDA credit line under the control of the Ministry of Agriculture and administered by the National Bank of Tunisia (BNT), which maintains regional offices in the governorate capitals; an IBRD-supplied credit line; and a West German-supplied line of credit known as FAI. The problem experienced by these lines of credit in making investment funds available to farmers is that they are all administered from Tunis and in many cases, they remain unknown to farmers except to the wealthier farmers who have contacts in Tunis or in the governorate capitals. In addition, the IBRD credit line imposes individual loan ceilings as well as minimum income and technical/economic analysis requirements which impede small farmer access to these funds. There is, according to reports of GOT officials in the project area, a great demand for farmer credit and in their opinion, many farmers would take advantage of such credit if they knew about it and were helped to apply.

C. USAID/Tunis has chosen, in this program, to follow the model of the Small Farmer Supervised Credit Project currently in implementation phase in Tunisia with A.I.D. support. The same structure will be used and lending arrangements will be the same. A CTDA level loan committee will be established with majority participation by CTDA officers as a means of overcoming the problem causing poor utilization of other lines of credit and moving credit out to the rural areas.

D. Insofar as this loan is in parallel with the Small Farmer Supervised Credit project, it will follow the same policy on interest rates. When prevailing interest rates are revised upwards for that project, they will be raised for the present project as well.

E. With respect to the interest rate question in the broader context of A.I.D. strategy, USAID/Tunis points out that the total amount of credit involved in the CTRD program is relatively small compared to agricultural credit outstanding in Tunisia as a whole, where inputs like fertilizer are heavily subsidized, and this means that the A.I.D. loan, under the CTRD program, affords little possibility of leverage on the GOT to revise interest rates upwards. Furthermore, the subsidy element implicit in current interest rate on loans

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for surface wells and fruit trees is much less than the subsidy element of GOT investment in public irrigated perimeters and does not lead to selection of more capital intensive technologies. This does not mean that UNADP will not explore other opportunities to make the rationale for higher interest rates known to the GOT at a high level, and to express the A.I.D. wish to see them revised accordingly. However, in the long run, it should be up to relatively large lenders, such as the IBRD, to take the lead in pursuing a strategy of upward revision of GOT interest rates.

II. LAND TITLING

A. Several forms of land tenure exist at present in the CTRD program area. There are, first of all, tribal lands ("terres collectives") owned collectively by one of the several tribal groups in the region. Such groups date back to the pastoral economy of nomadic and semi-nomadic grazing, and today, they have lost almost all their social and political function. Most of these tribal lands are located in the Delegations of Sbeitla, Djilma, and Thala. Secondly, there are privately-owned lands but without benefit of legal title because of fragmentation of land ownership over time ("terres en extreme indivision"). These are located mainly in the Delegations of Foussana, Sbiba, and Djedliane. Finally, there are legally-titled private lands.

LAND TENURE IN THE CTRD
(excluding Southern Alghiana)

Delegation	Type of tenure	Total Area under this type of tenure (ha.)	Area distributed (ha.)	Area to be distributed (ha.)	Grazing land (ha.)
Sbeitla	Terres Collectives	23,100	15,460	1,300	6,400
Thala	" "	4,580	2,152	728	1,700
Djilma	" "	31,500	16,000	7,500	8,000
Foussana	Terres en extr.indiv.	77,500	13,134	15,366	49,000
Sbiba	" "	36,500	0	18,000	18,500
Djedliane	" "	15,000	0	2,100	12,900

As may be seen from the above table, there remain large areas of land to which legal title has not yet been distributed. This constitutes a land tenure problem of serious proportions, but one that is perhaps less intractable than a situation resulting from large landholders attempting to circumvent previous land reforms by devices like sub-dividing land among family members, collecting "hidden" rents, etc., leading to situations of tenant eviction, squatting, etc. In Central Tunisia, land reform is largely unfinished administrative business.

B. The creation of several irrigated perimeters in the area within the past decade compelled the GOT to proceed with distribution of land titles with dispatch for the land affected by the costly investment in infrastructure and its benefits. Farmers on better lands elsewhere, for their part, have been able, in individual instances, to take advantage of their contacts to arrange for loans to finance improvements to shallow wells, purchase of pumps, etc. It is evident that any large-scale effort to extend such investments, by providing credit, will have to be predicated on GOT progress in distributing documents giving farmers sufficient claim to their land to obtain credit.

C. The GOT has handled the distribution of the "terres collectives" through a procedure of cadastral survey and issuance of titles, with communal grazing lands remaining the common property of the new recipients of land title and being administered by an elected management council. In the case of the "terres en extrême indivision", it is the individual farmer who must apply for a certificate of possession and is dependent on his neighbors to voluntarily testify that they do not have any claim on the land he occupies.

D. The successful distribution of several thousand titles to land falling in the latter category in the Delegation of Foussana was primarily the accomplishment of the Delegation Chief who was an expert on land titling. By means of holding meetings of farmers, he was able to obtain agreement on property boundaries and avoid time-consuming litigation, proceeding to the distribution of certificates of possession, essentially an identification document falling short of full legal title, but sufficient for purposes of qualification for bank credit. The result has been that there are enough such certificates in private hands today to make a start on moving credit to the farmers of Foussana for infrastructure acquisition which they welcome.

E. After careful study of the Foussana experience, USAID/Tunis is of the belief that documentation adequate for credit obtention can be distributed to farmers in other delegations in the program area provided that the CTDA contacts all the farmers in one area and proceeds with the settlement of conflicting boundary claims on a group basis and the Delegation Chiefs, who are the key GOT officials in each delegation, are convinced of the utility of the exercise and are willing to devote the time and effort to it.

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F. The Kassari Government has a disposal an experienced team of cadres assisted by the technical and financial project in the Arrondissement de M'Pondou. The project is attached to the CRDA, the Bureau de Recherche et d'Appui Technique (BRAT). These land tenure officers and their staffs will be trained over the far as the program area is concerned by the CTDA. Thus, the CTDA will be in a position to back-up the Delegation with trained staff to expedite the issuance of certificates of possession.

G. USAID proposes to generalize the Madama experience by supporting the close collaboration of Delegation staffs and CTDA technicians in the task of distributing certificates of possession to enable small farmers -- the farmer who has not yet been in a position to take advantage of the field area in all of the area -- to benefit from the program inputs. As the work to be done is mainly routine in nature (identifying field boundaries, helping farmers fill in questionnaires, etc.), there exists the possibility for CARE to play a useful role here. There also are GOI plans to extend the "terres collectives" procedure to the "terres en extreme indivision".

ANNEX F

AN INFORMATION SYSTEM FOR THE CENTRAL TUNISIA DEVELOPMENT AUTHORITY (CTDA)

A. STARTING POINTS

1. Some givens

a. The USAID contribution to the financing of the CTDA is scheduled to last three years (1979-1981) although the work of the CTDA will continue on beyond that time.

b. According to present plans, the Evaluation and Planning Unit (EPU) will be one of four offices supporting the Director of CTDA. The other offices are Program and Budget Control, Statistics, and Contracting.

c. The EPU will be engaged in a variety of activities ranging from specific operational suggestions and plans to data collection and the statistical evaluation of projects. This report focuses on the evaluation component of the work, although that term is used here in the very broad sense, covering description, monitoring and assessment, and general analysis of change and impact.

d. The evaluation activities of the EPU fall into two broad categories: the general and the specific. That is not a sterile distinction in this context. On the one hand, the CTDA will be concerned with broad changes and possibly a reorganization of the region. On the other, it will be concerned with a wide variety of specific interventions having to do with irrigated and dryland agriculture, potable water, small industries, health, etc. What is implied is a two-level information system.

e. The general versus specific classification of information needs just mentioned cuts across the list of officially listed "projects." These are labeled Dryland Farming Systems, Small Farmer Irrigation, Potable Water and Area Development. Clearly, Area Development

involves both general and specific orientations, and the other projects may also imply two levels of information. The proposed information system must cover all general and specific needs regardless of particular project designation.

f. The units of analysis relevant to the proposed information system include the following:

-- The three governorates (Siliana, Kasserine, Sidi Bou Zid) covered by the CTDA out of a total of 19 in Tunisia.

-- The eight target delegations out of a total of 116.

-- Approximately 12 weekly markets, usually in the towns or villages of the eight delegations, out of about 139 in Tunisia.

-- The 88 "secteurs" contained in the eight delegations.

-- Approximately 2,200 "groupements" (rural neighborhoods) in the 88 secteurs.

-- About 200,000 people in perhaps 30,000 households.

Additional special studies may focus on units such as schools, water sources, clinics, irrigated perimeters, annual festivals, grocery stores, farmers who keep bees, etc.

2. Some assumptions

a. The headquarters of the CTDA will be located in the town of Kasserine.

b. The personnel and expertise potentially available to the EPU section will be as follows:

-- A permanent staff based in Kasserine of five professionals (Master's level) plus para-professionals.

-- A group of eight to ten summer interns who most likely will be Tunisian students hired for the summer and living in Kasserine. In addition to stipends, they will be given general social science training. In return, they will be available for interviewing and other routine chores.

-- A U.S. consultant team of about two people (working part-time) assigned to assist the permanent staff.

-- Unspecified analysis and evaluation skills among the planners in the EPU.

-- Contract arrangements with such groups as Centre National d'Etudes Agricoles, Groupe Huit, various institutes in the University, and free-lance consultants living in Tunisia.

-- Consultants from outside of Tunisia on an ad hoc basis.

c. The annual budget for the EPU must cover both planning and research needs. Only a portion of the funds will be available for the information system described here. Note, however, that the term "information system" is being used to cover a variety of special studies and evaluations in addition to the more routine data collection and analysis. On the other hand, the U.S. costs of the U.S. consulting team are separate.

d. Although the USAID contribution is scheduled to end after three years, it is nevertheless expected that the CTDA will have an impact(s) by that time. On this assumption, evaluation research and specifically any baseline studies, must get off to a racing start and be programmed to deliver results by the end of the three-year

period. In effect, this means collecting data after 2-1/2 years, allowing six months for write-up. Assuming that the research team conducts its baseline study about September/October of the first year, we are left with a span of two years. Some extension of this time frame may be possible, but it cannot be assumed at this time.

c. The Tunisia staff will be responsible for the research and will make all important decisions. The U.S. consultants will not do the research. They will assist the Tunisian staff by advising and consulting, conducting training sessions on the basis of relevant materials and by doing some exploratory analysis and general trouble-shooting. In general, the consultants will work ahead so that the permanent staff is presented with as few surprises as possible.

f. The permanent Tunisian staff will be expected to continue their work after the U.S. consultant team has left. Therefore, training is expected to be an important component of the consultants' work. It will take two forms: specific advice and occasional formal sessions with the permanent staff, and assisting the training of "summer interns" described above.

g. The level of precision of the information system should be commensurate with the context (i.e., poor region with little easy-to-measure formal organization), the problem, and the capacities of the permanent research staff. The appropriate level will vary and in any case is a matter of judgment, but this general assumption implies that sample survey research should be used sparingly because, despite its widespread use (and misuse), it tends to be an overprecise, costly and a demanding technique.

h. USAID has an interest in evaluation that is somewhat different from that of the CTDA. Both agencies want to evaluate approaches and progress, presumably, but A.I.D. must show additionally that the efforts have benefited the poor and have not had deleterious side-effects.

It is likely that the permanent staff and the consultants can serve both masters, but it is also possible that A.I.D. may want to commission an outside evaluation team at the end of three years. In that event, the data base and results of the EPU should provide a basis for an effective outside evaluation.

i. All sides are interested in devising an information system that will work in other poor regions and that will not require highly trained staff and heavy financing.

B. STAFFING AND EQUIPMENT PROPOSALS

1. Permanent EPU Staff, Kasserine-based

A principal appointment with strong Master's level training, with exposure to American research approaches, quantitative skills, including computer use, and an openness to innovation will be required. He need not speak English, but that would be helpful. His disciplinary background is less important than his general qualifications. At least some of the other four supporting staff should also be at the Master's level if possible, although a strong B.A. or the equivalent in experience may suffice. Whatever their level of training, they should all be capable of carrying studies in their area of expertise from beginning to end, including and especially the write-up. In addition, all should be capable of learning to use a mini-computer (see below).

The specific disciplinary background of the supporting staff is not important and in most cases irrelevant. However, the following skills should be available and distributed among the "evaluation staff": basic computer programming, economic analysis, sample survey techniques, cross-tabular analysis, regression analysis, "exploratory" interviewing, observation experience, research design for evaluation, knowledge of social indicators, techniques of measurement in the social sciences, etc. Presumably, the planners in the office will command some of these skills, too. So much the better.

2. Summer Trainees

The characteristics and functions of this group are self-evident. It remains to be added that they should be looked at from the point of view of staff recruiting in the event that there is turn-over in the permanent staff.

3. U.S. Consultant Team

Like the permanent staff, this group should command a variety of skills. They should also speak French, of course.

4. Computer Equipment

It is recommended that a Hewitt-Packard 45 desk-top computer be purchased and set up in Kasserine. This recommendation can be this specific because CNEA has just purchased this model, presumably after investigation of its feasibility in the Tunisian context. Such feasibility should be examined in detail, of course, and any problems that develop in their machine between now and the time of purchase of a second computer should be noted, but CNEA specifically dealt with the problem of voltage variability by purchasing an Italian made voltage regulator.

Given the small number of cases of interest to this information system, the capacity of the HP 45, which is 64K, will be sufficient. Large data sets can be analyzed in Tunis on a larger machine, although such large data sets are not envisioned for this system. More problematical is the software. Hewitt-Packard does have a software package that handles most statistical operations, but something more is needed for this project, namely, a data management package. Such a package is to computing as an automatic gearshift is to driving a car -- it costs more, but inept people can get places. It is a requirement for this project because all permanent research staff, including planners, must be able to access the various files. The program of choice would be SPSS, but it requires

100K of memory. It is possible that a stripped-down version could be produced or possibly the memory of the HP 45 could be augmented. This problem can probably be solved by the U.S. consultant team. Meanwhile, there is a package called Minitab which will work on the HP 45 and offers most of the features of SPSS. So, it can be said with near certainty that the computer will function.

This machine and the associated peripheral equipment such as card reader, a printer and a graph producer (which does maps) will cost about \$50,000 installed. Servicing may be a problem, but CNEA feels confident on this score.

A computer of this type is important to this project because the anticipated research requirements outstrip hand methods. It is also needed as a training tool, as a means for organizing the data generated by the project, as a device for assisting (via the graphs and graphics) communication with administrators and planners, and possibly as a means of attracting and holding competent staff in an isolated location. It will also make the research staff independent of the breakdowns, overloads and gate-keepers of a large Tunis-based computer.

C. PROPOSAL FOR DATA FILES

As used here, the term data file refers to a tape cassette on which data are stored according to the unit of analysis (such as a delegation or a secteur) and the date of measurement, usually a particular year. If a given tape is limited to one unit of analysis, as is typically the case, then the unit designation is understood. The actual data (e.g., "Number of irrigated farms in 1966") is identified by the codebook which, itself, may be on the tape. Once a basic data file is built, analysis proceeds immediately to "reduction," that is, the construction of indices, scales and other summary indicators that effectively reduce the number of variables to as little as 20 percent of the original set. This refined data set, which may properly be called the basic "variables," is the basis of what is usually referred to as "analysis."

Clearly the organization of files is crucial for all subsequent research. Moreover, a given file reflects the type of data available, and conditions the kind of variables that may be added. For example, if one has a file of delegations, most of the data will come from official statistics. It is not likely that field-collected data will be added to a file that covers these units for the whole country. Moreover, a file at this level pre-determines, in the Tunisian context, the number of measurement points, because census data of any depth is available only for 1966 and 1975. On the other hand, it is possible to have several files -- as proposed below -- and within limits, files can be linked to each other. So, the decision as to which unit to use is not irrevocable, although it is strategic.

1. The Secteur File

It is proposed to make this unit and its associated data file the backbone of the information system. It has been established that this is a real social unit and that each secteur has at least one knowledgeable spokesman from which information can be obtained. Observations are also possible because the unit tends to be small and homogeneous. There are enough secteurs in the eight delegations for fairly refined statistical analysis, and others could be added as controls. Finally, if the CTDA does not show an impact on at least some of these secteurs, its efficacy may be questioned.

The Tunisian census is not reported at this level except in the most minimal terms. Consequently, almost all information will have to be collected by interviews with the "omdans," that is, the secteur head, who is both government-appointed and traditionally respected. From these "informant interviews" the average level of welfare for the dryland and the irrigated farmers can be estimated, as well as their yield per hectare. These two variables, specified according to "class," may be

considered the "dependent" or criterion variables for the whole project. They are crucial for most estimates of progress. However, the interviews may be expected to produce a wealth of information on the institutional structure of the secteurs. Experience shows that the many items of information usually coalesce into four broad clusters: institutional specialization, especially in retail trade, education and health; communal organization, as expressed in ethnic allegiances, political participation, festivals, etc.; the authority structure, as reflected in the chain of command from the governor to the delegation leader to the secteur leader. There is a parallel structure for the party. However, the authority structure is also reflected in ethnic and class rigidities. Last is the organization of grants and subsidies which tends to diverge from the administrative structure, at least as conceptualized above. In addition to these broad categories, there are many measures of ecology, demography, transportation, etc. which must be handled separately.

It goes without saying that any particular indicator can be analyzed separately even though it is a component of one of these clusters. Administrators tend to prefer single indicators because the information is familiar and because they often believe that they can manipulate the inputs required to change them (i.e., the way to increase the average amount of clean water used per family is to dig more wells). That is true in some cases, but such simple input-output thinking is usually undermined by demonstrating, as is all too easy, that many indicators of welfare are highly intercorrelated and that it is a whole complex that must be changed. Moreover, it quickly emerges that the determinants of, say, the average level of poverty-health-education is some factor or factors that is not readily manipulatable at the delegation or even at the national level.

These passing comments on tractable variables are relevant to the problem of specifying indicators. With the exception of the variables of welfare and agricultural productivity mentioned above -- and even these are quite general -- this proposal will not specify indicators.

To do so would be to mislead and to pre-judge the work of the research office. The fact is that there are no standard indicators in the social sciences. There is some agreement on general areas of concern such as nutrition or education, but the actual measures must be devised anew for a group or a context. In some industrialized countries, standardized measures have been devised, but even these get out of date periodically. If the social sciences possessed a measure even as good as a yardstick without the inches marked, it would be a bright day indeed. Instead, we must calibrate "level of living scales" or measures of "institutional specialization" for each region under study. Building such indices may require as much as 50 percent of the time devoted to analysis, and yet it hardly shows up in the final report.

If the first information survey of omgahs is conducted in late summer or early fall (after the harvest and during the dry season), and annually thereafter, a time series will quickly build up and analysis of change and the causes of change can be pursued. Also, the various estimates of the informants can be studied and perhaps improved.

It is possible to do two of these interviews per day. Assuming a crew of five interviewers and 100 interviews, the data collection could be finished in about two weeks. Analysis is similar to sample survey work and involves few special procedures. After the first year, reports could be produced in two months, at a cost of about \$8,000. This estimate should be compared to the survey of 111 farm families in the Hababs district which cost \$17,000 and took about six months. Actually that report included much non-survey material and the actual data collection required only a whirlwind seven days. Some of the cost, of course, was overhead for CNEA. The main point is that for about the same outlay, one gains a picture of the entire region, not just 1/68th of it. There is a difference in the level of precision, of course. But the proposed level is adequate to the problem.

BEST AVAILABLE DOCUMENT

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2. The Delegation File

This file will be familiar to most social scientists because it is a style of comparison much used in demographic research. The main source of data is the census, but much information is available in agencies. In addition, any variables available at the governorate level can be included. The effect of this last is to assign the same value to all delegations in the governorate, thereby reducing the discrimination of the measure, but even such limited variability is sufficient for present purposes.

It might be asked -- "Why should the CTDA concern itself with all the delegations in Tunisia when it is interested only in a particular eight?" The answer is that a comparative perspective is absolutely necessary for a regional project. It may well be, for example, that evaluations of individual delegations are positive while the region as a whole has lost ground relative to other parts of Tunisia. That grim possibility must be established.

The delegation file will permit a comparison at two points in time. If proxy measures can be found for 1981, a third point will be available. Given the comparability of the data, it may be possible to do "panel regression," which is a particularly strong form of change analysis. The delegation file may permit some modeling of change in welfare levels. This kind of activity can easily get out of hand in a project such as this, and become an end in itself, but handled conservatively, it stimulates thinking among researchers and planners alike.

3. Market File

It is expected that the structure of markets will be of great interest to the planners and it is an important level of analysis in any event. It will first be necessary to analyze the market network for all of Tunisia, although one version of that network already

exists in a report by the consulting firm Groupe Huit. The findings seem to show that the Central Tunisia region is served by the outer edges of several marketing structures, and the implication is that that is one of the problems of the region. Be that as it may, it will be necessary to make a judgment about what segment or segments of the Tunisian network should be analyzed more intensively and a survey of markets instituted. Very likely about 50 markets will have to be surveyed to get a complete picture, but thereafter, changes in the system can be tracked with less effort. Some variables from this file can be linked to the secteur and delegation files.

4. Special Purpose Files

It will probably be useful to survey the school teachers not only to find out about the children in their classes, but as informants about certain aspects of the secteur. A survey of a sample of the grocery stores would augment the market study and provide an alternative measure of average welfare in each secteur. A survey of water sources, perhaps piggy-backed on other studies in order to cut costs, would provide a continuing monitor for one of the project's important goals. Finally, it will probably be necessary to study panels of dryland and irrigated farmers, using a sample survey, in order to assess changes in this crucial category. This is so even though the results of the agronomic research relevant to the dryland farmers will probably not be available for several years.

5. One-Shot Files

The term file, as used above, implies the regular addition of data with a view to longitudinal analysis. However, rather large files of data accumulate from "one-shot" studies when there is no intent to repeat the survey. For example, it might be important to commission an observational and discursive survey of any innovations that the inhabitants of the region have devised that improved household welfare at low cost. The possibility of collecting water on the roofs of houses is an

example. This kind of information can be put into a retrieval file -- although it may not be worth the effort -- but it is not the kind of thing that one would normally repeat. It is likely that many one-shot files will accumulate particularly at the outset of the project when the planners are scratching for ideas.

D. TYPES OF ANALYSIS

1. Validity Tests

Preliminary to what is usually referred to as "analysis" but in addition to measurement is the necessity of validating some of the measures, particularly the informant estimates of welfare and productivity. With respect to the productivity measure, for instance, it will be necessary to commission an independent assessment, based on actual observation and interviews, of a sample of farms. Thus, it will be possible to correlate the two farm-level measures and then to use one or both of these to estimate the average for the relevant secteurs. A survey of 10 or 15 secteurs should suffice to establish the validity of the informant-based measure. A similar validation study will be necessary for the welfare estimates. These studies are further examples, by the way, of one-shot files.

2. Three Types of Analysis

Coming to analysis proper, there are three general types. The first is comparative description and typological analysis. There is something very impressive, both to practical and theoretical people alike, of a comparison of types of delegations, secteurs, etc., particularly if a trend line is available. What is involved here is the combination of variables that have practical (and possibly theoretical significance) with a strategic classification. With respect to farmers, the irrigated/dryland types seem crucial, but some other classification, perhaps of diversified/non-diversified farmers, may show large differences in productivity. At the secteur level,

which is the backbone unit of the proposed system, the obvious basis of classification is number of specialized institutions. Distance from a major market center is another standard classification variable. But, there are many others in the literature, some quite surprising.

Evaluation is the type of analysis that is most central to the interests of CTDA. Ideally, it involves random assignment of treatment, measurement at two points in time, and comparison with a control group. Technically speaking, it is not necessary to have a pre-test if the interventions are randomly assigned, but such a baseline measure does increase the precision of the study. It goes without saying that the "control group" need not be a single group. In social research where variation is the rule, one always takes enough cases (a minimum of 15-20) to be able to compute a stable central tendency for the control as well as the experimental group.

It is not likely, however, that the ideal experimental design, involving the politically unacceptable random assignment of new seeds, dispensaries, wells, etc. will be possible, even if it were moral. So, we are left with "quasi-experimental design." These take two forms: (a) before and after measurement, with controls, or, (b) many measurements of a target group(s) with no control. In the latter case, the earlier state of the unit under study is the control, and one depends on finding a sharp change in the trend line to make the inference that the intervention made a difference. Neither type of design has randomization.

A problem with all these quasi-experimental designs is demonstrating that one's intervention was the cause. Was it the CTDA that improved welfare or was it outside work which would have had an effect without a rural development project? Was it improved farm practices or simply more rain that raised yields? These are familiar problems and imply the need for multi-variate analysis to separate out the effects of different factors.

Here is an example of a multi-variate (regression) analysis that should be feasible in Central Tunisia:

<u>Predicting:</u>	<u>Regression Coefficients for:</u>			
	Measure of project impact	Percent irrigated farms in secteur	Distance from market town	Percent of labor force engaged in migrant work
Amount of change in welfare	b*	b*	0	b*

* Regression coefficient significant at the .05 level

This example illustrates the final result of an analysis of the separate effect of four variables on some measure of change in welfare, say, the proportion of households that have improved their floors or roofs between 1979 and 1981. The "independent" variables should be measured as of 1979, but in this short-term situation, the exact year does not matter so much. Regression is the statistical technique of choice because it shows the effect of a given independent variable when all the others are held constant. That is the magic of regression. In more substantive terms, this table poses the question of whether a given project intervention -- and many different measures can be inserted -- has (a) a statistically significant impact that (b) holds even in competition with well-known (but not project induced) factors in regional development. This is the acid test of project intervention and most fail this test.

After all, the "natural factors" have been operating for many years or decades, while the project intervention is recent and specific. So why should one expect it to have an effect, at least in the span of three years? But, that is precisely what is expected.

A simpler version of the above design is possible with cross-tabulation and percentage differences, and it will be presented in training. However, it is quite unwieldy and somewhat imprecise.

It is obvious that this same format can be used for a variety of problems. A measure of welfare or productivity at one point in time could be inserted, instead of the change measure, which has some problems. Alternatively, the dependent variable could be a specific project intervention, such as the number of improved water sources per secteur. What factors determine such locations? Hypothesis: policy and rational considerations will account for no more than 30 percent of the variance!

Despite the beauties and power of regression analysis, it involves many technical problems, requires high quality data, and most important in the present context, the results are difficult to communicate. In some cases, there may be easier and better ways to make evaluations. Where one can isolate a factor, like water, that has undeniable benefits on health and welfare, particularly among the poor, and where the improvement in the factor is dramatic and fully utilized, then a clean-cut evaluation may be possible. Admittedly such single-factor impacts are difficult to find, but in this region where social services are so thin, such evaluations may be possible. Little or no quantification will be required, and the results will be readily understandable.

The last type is causal analysis. Here, the interest is in how things work, whether the causal factor was a project intervention or not. The mode of analysis is similar to sophisticated evaluation, but the focus of attention is different. Also, the exercise is usually more theoretically oriented. This kind of analysis will be needed by the CTDA despite the protests of the practical men. Such analysis will be relevant in the second or third year, after the data base has been built up, and after a number of applied studies have been completed. It is time-consuming and often recondite work. But when it is successful, it makes all the difference, because there is really nothing so practical as an adequate explanation of how things work.

E. ISSUES AND PROBLEMS

1. Is this the Appropriate Level of Technology?

Central Tunisia is a poor area and one may wonder whether the proposed level of research and computer technology is compatible with the kind of rough and ready interventions that probably will be proposed and needed. And even if it is compatible, it may still be asked whether the proposed level of expertise and technology is consistent with the desire to generalize the approach that may evolve here. In a certain sense, of course, these are unanswerable questions because everything depends on what comes out of this project. If some sure-fire approach to area development of arid regions emerges, then all sides would agree that the level of technology was appropriate and worth the money for any poor region.

Since we cannot know what the outcome of this work will be, we must rely on other criteria, the foremost of which are the pressures for evaluation imbedded in the various project papers. The clear implication in the description of the proposed area development program is that the researchers should attempt to follow all the interventions in order to provide a running account of how they are working and, of course, to evaluate them. Although it is not likely, one can imagine an instance where an intervention had little effect on Central Tunisia but was shown to be promising by a careful evaluation.

Of course, evaluation takes many forms. Some might be satisfied with a before and after survey (based on several hundred families, for example) of the whole region and an estimate of whether there was any positive effect on the welfare level. Such an evaluation would have to assume -- without direct proof -- that the development project contributed to such an advance, even though other factors may have operated. Moreover, the lack of data on the secteur-level unit implied by this generally means that no refined analysis of the project impact would be possible.

In this perspective, such a general evaluation could be worse than nothing because it might leave the impression that the project was successful -- or that it failed -- when an opposite conclusion might be true and demonstrable with a different methodology.

The foregoing arguments against simplistic evaluation are consistent with the implication and tone of the project papers to the effect that it is important to really understand how each intervention works or whether it does. If that is so, then a more sophisticated version of evaluation is necessary along the lines already proposed. And that requires considerable research and consultant back-up. But, it should be noted that the 88-unit informant survey is much simpler and cheaper than a sample survey of all the secteurs (88 x 100 families = 8800).

A parallel problem is whether or not this regional authority needs \$50,000 worth of desk-top computing capacity. Of course, the computer will probably last ten or more years, so its cost can be amortized. Even if that were not the case, it would still be a good choice because we simply do not know as yet what will be the computing needs and this is a best guess as to what capacity will be required. If this type of computerized data management is successful, then it should be possible to cut computer costs on all future projects. The price of these machines is dropping rapidly, and it is likely that servicing will improve, so that one need not buy an expensive machine simply to be sure of servicing as must be done in this case. To sum up, it is likely that the proposed project will require the computing capacity that has been suggested, but once reliable methodologies are established, much cheaper computers could be used (one-fifth of the projected cost?).

2. How will the Research Team Contribute to the Work of the Planners?

The answer is that it cannot contribute directly to the search for substantive programs. Creating such programs is a complex art. They cannot be generated by empirical research. On the other hand, the kind of research that is proposed may condition planning efforts in two respects:

a. Description of the regional social organization, and

b. Elimination of ineffective programs.

With respect to the first point, it needs to be emphasized that the informant survey is most appropriate when one wants to measure social organization. It is not the instrument of choice if one wants to make an estimate of average family welfare, even though in the present case, it will be used for that purpose (accompanied by a validation study). If one makes the further assumption that planners really need to know about the institutions of a region, then the informant survey may generate the description and measurement that planners have never had before. Furthermore, the analysis approach that is usually used in conjunction with the informant survey typically produces a relatively few variables that nevertheless are quite broad. For example, it is possible to rank sectors with respect to institutional complexity and to show that the general measure of complexity implies given levels of educational, health, business, and even political and religious specialization.

The "pruning" or editing function of evaluation research is obvious, although painful to contemplate. One is reminded of the impact of aerial photography in the assessment of bombing in the early months of World War II. The photographs showed that industries and buildings claimed to have been destroyed by the pilots were still standing. The assessment did not tell the pilots what to do to destroy the buildings -- although the available methods were rather limited -- but it did not allow them to continue on in the illusion that their bombing had been effective. Admittedly, area planning is a much more complex activity than bombing, but the general point -- the demonstration of what is not happening -- is still apparent.

There is, however, another way to approach the relationship of research to planning. If the researcher uses a particular theory or hypothesis, and if the research bears this hypothesis out, then the planners are in possession of substantive knowledge that they could act upon. For example, it might be possible to show that "an increase in the central place status of a secteur results in a rise in the average secteur welfare." There is a considerable literature that supports this hypothesis although it must be admitted that the many cross-cutting variables, such as rigid social class or migration, have not adequately been taken into account. Nevertheless, one can see that if this hypothesis holds in the region under consideration, it might give somewhat more specific direction to the planners. It would not tell them how to enhance the level of central places, but it would pose the problem more sharply. Note also that the hypothesis is not very specific, saying nothing about how much of an increase in central place status would cause a particular increase in welfare level. Perhaps empirical studies could refine the hypothesis, but as it stands, it is a fair example of social science knowledge. We are lucky if we can specify whether the relationship should be positive or negative.

The data generated by the informant survey is open to interpretation from a variety of theoretical view points and these will be introduced in the course of the work, even though much of the research will be concrete and empirical, with theory taking a backseat in most cases. But even if the effort to introduce theory (i.e., explanations) is successful, it may not contribute that much to the work of the planners. They must frame their programs in terms of manipulatable variables. Thus, even if the above-mentioned proposition about central place status turns out to be true, it may not be that helpful because nobody seems to know how to change central place status. This impasse, which is a frequent one in the social sciences, can only be resolved by more extensive knowledge of processes. Then more considered judgments may be possible. Either a variable can be found that is tractable or thinking may gravitate to a search for some indirect way to change what seems like an intractable variable.

COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Security Supporting Assistance funds.

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent patterns of gross violation of internationally recognized human rights.
The project is designed to assist the most needy segment of the Tunisian population. See Project Paper section on technical and social analyses. The Department of State has not determined that the GOT has engaged in consistent patterns of gross violations of internationally recognized human rights.

2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotic drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their

dependents, or from entering the U.S. unlawfully?

No.

3. FAA Sec 620 (b).
If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?

Yes.

4. FAA Sec. 620(c).
If assistance is to 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) debt is not denied or contested by such government?

Not to our knowledge.

5. 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.

6. FAA Sec. 620(a), 620 (b); App. Sec. 107, 114.
Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Mozambique or Angola? No.

7. FAA Sec. 620(i).
Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) planning of such subversion or aggression? No.

8. 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.

9. FAA Sec. 620(l).
If the country has failed to institute the investment guaranty program for the specific

risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason?

The GOT has an investment guarantee program with the United States of America.

10. FAA Sec. 620(0);
Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters,

a. has any deduction required by Fishermen's Protective Act been made?

b. has complete denial of assistance been considered by AID Administrator?

Tunisia has not taken such action.

11. FAA Sec. 620(g);
App. Sec. 503.
(a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act

appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default?

Tunisia is current on loan payments.

12. FAA Sec. 620(s).
"If contemplated assistance is development loan (including Alliance loan) or security supporting assistance, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the amount spent for the purchase of sophisticated weapons systems?"
(An affirmative answer may refer to the record of the taking into account, e.g.:
"Yes as reported in annual report on implementation of Sec. 620(s)."
This report is prepared at the time of approval by the Administrator of the Operational Year Budget. Upward changes in the Sec. 620(s) factors occurring in the course of the year, of sufficient significance to indicate that an affir-

mative answer might need review, should still be reported, but the statutory checklist will not normally be the preferred vehicle to do so.)

Approximately 7.5% of the GOT's budget is for military expenditures. This has not been determined to be an excessive amount.

13. 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?
14. 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 AID Administrator in determining the current AID Operational Year Budget?
15. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?
16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or

No, to the first question.

The GOT payments are not in arrears.

No.

employee of the
U.S. there to
carry out economic
development program
under FAA?

No.

17. FAA Sec. 669, 670.
Has the country, after
August 3, 1977, deli-
vered or received nu-
clear enrichment or
reprocessing equipment,
materials, or techno-
logy, without speci-
fied arrangements or
safeguards? Has it
detonated a nuclear
device after August
3, 1977 although not
a "nuclear-weapon
State" under the non-
proliferation treaty?

No.

18. FAA Sec. 901. Has
the country denied
its citizens the right
or opportunity to
emigrate?

No.

B. FUNDING CRITERIA FOR COUNTRY

1. Development Assistance
Country Criteria

- a. FAA Sec. 102(c),
(d). Have criteria
been established, and
taken into account, to
assess commitment and
progress of country
in development, on
such indexes as: (1)
small-farm labor in-
tensive agri-culture,
(2) reduced infant
mortality, (3) popu-
lation growth, (4)
equality of income

The GOT has conducted
sophisticated research
into social and economic
problems of health and
nutrition, rural-urban
migration income dist-
ribution, underemployment,
and unemployment, popu-
lation growth, rural
development, etc..
Findings have been in-
corporated into planned
and current programs and
projects in education

distribution, and (5) unemployment.

agriculture, rural development schemes, social and welfare activities, and other development efforts. A major focus of the current five-year plan addresses employment, income equities, rural and small-farmer production, and improved health and educational services.

b. FAA Sec. 104(d)
(1). If appropriate, is this development (including Sahel) activity designed to build motivation for smaller families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?

Yes. This and other activities to be undertaken during FY 79 focus on an integrated approach addressing especially section 104(d) development criteria.

c. FAA Sec 201(b)(5),
(7) & (8); Sec.
208; 211(a)(4),
(7). Describe extent to which country is:

(1) Making appropriate efforts to increase food production and improve means for food storage and distribution.

The GOT has undertaken major integrated crop production programs in wheat which has resulted in significant and consistent increases. Production of durum (hard wheat) a staple food for all income classes - but especially the poor - has more than doubled during the period 1970-1975. Research to develop and adapt new practices and technologies is being expanded.

150

(2) Creating a favorable climate for foreign and domestic private enterprise and investment.

The GOT has a policy of encouraging both domestic and foreign private investment. Much domestic investment has been in tourism, and to a much lesser extent, small industrial and service activities. Last year API, the Agency for the Promotion of Investments, approved more than 500 applications for new investment projects. Tunisia continues to be politically favorable for foreign investment.

(3) Increasing the public's role in the developmental process.

The GOT has a number of programs emphasizing rural populations, urban poor, women, youth, unskilled and lesser educated classes, which are designed to increase the role of these and other marginal groups in the developmental process.

(4) (a) Allocating available budgetary resources to development.

(a) Tunisia has a relatively high savings rate. These savings have financed a growth rate which averaged 5% per year during the last five years. A substantial amount of current or planned budgetary resources is devoted to developmental activities.

(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.

Tunisia maintains a very modest military establishment. It has not diverted resources into unnecessary military expenditures or intervention in affairs of other foreign nations.

(5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

(6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

d. FAA Sec. 201(b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

The GOT has recently established new rates and procedures to improve income and excise tax collections from upper income groups. A new agency has been created to facilitate agricultural land distribution and title of ownership. Current economic policies encourage private business initiative, and the GOT is engaged in other social and political reforms.

Among developing nations the GOT has compiled an impressive record of economic growth during the seventies. Improved diets, reduced infant mortality and declining birth rates have accompanied the improved economic performance. Inflation has remained manageable, efforts are being made to improve good and agriculture production, and the current five-year plan stresses the building of a capacity for self-sustaining, long-term growth potential.

Yes.

e. FAA Sec. 115.
Will country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, has Congress specifically authorized such use of funds, or is assistance for population programs, humanitarian aid through international organizations, or regional programs?

No, to the first question.

2. Security Supporting Assistance Country Criteria

None of these criteria is applicable to Tunisia.

a. FAA Sec. 502B.
Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section?

b. FAA Sec 531. Is the Assistance to be furnished to a friendly country, organization, or body eligible to receive assistance?

c. FAA Sec. 533(c)(2).
Will assistance under the Southern African Special Requirements fund be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests?

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?

e, App. Sec. 113. Will security assistance be provided for the purpose of aiding directly the efforts of the government of such country to repress the legitimate rights of the population of such country to the Universal Declaration of Human Rights?

f. FAA Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1978?

PROJECT CHECKLIST

II. A. GENERAL CRITERIA FOR PROJECT

1. App. Unnumbered: FAA Sec. 653(b), Sec. 671.
(a) Describe how Committees on Appropriations 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 figure plus 10%)?
2. FAA Sec. 611(a)(1).
Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the US of the assistance?
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?

II. A. GENERAL CRITERIA FOR PROJECT

1.
 - (a) Project is included in AID's CP for FY 79. If levels change a notification will be made.
 - (b) Yes.
2. Yes - See project paper.
3. No further legislative action is required.

4. FAA Sec. 611(b): App. Sec. 101. If a water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for planning water and related land resources dated October 25, 1973?
4. Not applicable.
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 the country's capability effectively to maintain and utilize the project?
5. Not applicable.
6. FAA Sec. 209, 619. Is project susceptible of 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. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?
6. Project is to improve the status of rural poor of the Central Tunisia Zone. It is not readily susceptible for execution as a regional or multilateral effort. Tunisia is not a newly independent country.

7. FAA Sec 601(a); (Sec. 201(f) for development loans). 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; (c) encourage development and use of cooperatives, 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.
8. FAA Sec. 601(b). Information and conclusion 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).
9. FAA Sec. 612(b); Sec. 636(h). 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
7. This project will encourage efforts to improve the technical proficiency of agriculture, commerce, and supporting institutions. Successful implementation may lead to improvements in (a) (b) and (c). The connection to (d) and (f) is less evident.
8. Technical assistance will be obtained from U.S. Universities. There is no direct connection with U.S. private trade or investment.
9. The GOT will make substantial contributions to financing local costs. AA/NE is being requested to make a section 612(b) determination that will permit dollars to be spent for certain project level costs.

owned by the U.S. are utilized to meet the cost of contractual and other services.

Contractors will be required to obtain their local currency through the U.S. Embassy.

10. FAA Sec. Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

10. Tunisia is a near excess currency country. Local currencies are being programmed in Tunisia for a wide variety of uses.

11. ISA 14. Are any FAA funds for FY 79 being used in this Project to construct, operate, maintain, or supply fuel for, any nuclear powerplant under an agreement for cooperation between the U.S. and any other country?

11. Certainly not!

B. FUNDING CRITERIA FOR PROJECT

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

1. Development Assistance Project Criteria

a. FAA SEC. 102(c); Sec. 111; Sec. 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, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves

a. Concentration of project resources on specific interventions associated with small and lower income farmers in specific project development areas. Activities involve labor-intensive production as well as development and investment requirements for rural areas. See applicable PP sections.

toward better life and otherwise encourage democratic private and local governmental institutions?

b. FAA Sec. 103, 103A, 104, 105, 106, 107.

Is assistance being made available:

(1) (103) for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; (103A) if for agricultural research is full account taken of needs of small farmers.

(1) Project provides for interventions specifically designed to focus on areas and regions primarily applicable to needs of small farmers and rural poor. See PP.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost sharing requirements been waived for a "relatively least-developed country")?

c. The GOT will contribute well above 25% of cost of this project in various forms. A covenant on GOT financing will be included in the project agreement.

d. 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"?

d. Not applicable

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry, free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

e. This project will contribute to the development of social and economic institutions; self-help in meeting the country's food needs; improving the availability of trained worker-power; improving administration and quality of support extended to rural areas especially Central Tunisia and improving health of the target population. Project is also beneficial to women who are active in rural areas.

f. 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 civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

g. FAA SEC. 201(b)(2)-(4) and -(8); Sec 201(e); Sec. 211(a)(1)-(3) and -(8). 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; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

h. FAA Sec. 201(b)(6); Sec 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy with special

f. The project is designed to address the needs and capacities of Tunisia at this stage of development. It responds to studied needs as identified by the GOT, international organizations (i.e. IBRD), and bilateral donors as well as people of the area served by the project.

g. Yes - See PP

h. All imported goods and services for the project are expected to be of U.S. source and origin.

reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance of payment position.

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

c. FAA Sec. 201(e). If loan is not made pursuant to a multi-lateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

a. Such other financing is not available.

b. Given Tunisia's economic situation, the prospects for repayment of the loan portion of the assistance are good. The loan terms (2% during the grace period and 3% thereafter) are certainly reasonable and are legal in Tunisia.

c. An application for the assistance has been submitted by the GOT. See PP.

d. FAA Sec. 201(f).
Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

d. Yes.

e. FAA Sec. 202(a).
Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

e. A portion of the loan will be used for small farmer credit. AID assistance will finance procurement from private sources.

f. FAA Sec. 620(d).
If assistance is for any productive enterprise which will compete in the U.S. with US. enterprise, 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?

f. Not applicable.

MINISTÈRE
DE L'AGRICULTURE

DEC 29 1977

Tunis, le

N°

COPY	
7/12	TAKEN
N.A.N.	Monsieur Hermon.S. Davis

replied by letter 2-3-78

Directeur, USAID

TUNIS

ACTION INFO	
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OBJET : Aide éventuelle de l'AID pour la Tunisie Centrale.

REFER : Votre lettre du 7 Décembre 1977.

*-

Monsieur le Directeur,

Suite à votre lettre citée en référence, par laquelle vous m'avez transmis une copie du télégramme que la mission a reçu de votre bureau Central de Washington D.C., j'ai l'honneur de vous faire connaître que :

1/ Dans le cadre du Projet Tunisie Centrale soumis au financement AID, il est prévu la création d'un Office de Développement Rural qui aura pour tâche de veiller à la gestion (planification, exécution et évaluation) des programmes d'investissement prévus. Cet office sera créé dès approbation du financement du projet.

2/ Le coût du projet estimé à environ 50 millions de dollars pourrait être supporté conjointement par l'USAID, le budget de l'Etat et le budget du Programme de Développement Rural. Le montant de 50 millions de dollars proposé à un financement AID est donc susceptible de révision.

3/ En ce qui concerne les commentaires de la Banque Mondiale à ce projet, je me permets de vous préciser que :

a) Tout d'abord, le Gouvernement Tunisien a présenté ce projet à la Banque Mondiale en tant que Projet de Développement Rural Intégré conçu d'une manière telle qu'il améliorera les conditions de vie, et la distribution de revenu de la couche de population la plus déservitée du pays (target group). C'est ainsi que des composantes d'équipements socio-économiques (santé, éducation, route, électricité) ont été largement prévues parallèlement aux composantes productives agricoles et agro-industrielles.

Le Gouvernement Tunisien souhaitait que la Banque financerait ce projet à partir des ressources IDA ou du 3^e et 4^e guichet. Malheureusement, la Banque Mondiale a considéré ce projet comme un projet classique productif et a évalué son éligibilité à un financement à partir des ressources normales de la Banque soumis (aux taux d'intérêt élevés);. Ces considérations expliquent à notre avis la réticence de la Banque vis à vis du projet.

b) La critique de fond de la Banque Mondiale est que les composantes socio-économiques du projet (dont les avantages sont difficiles à quantifier) ont fait augmenter énormément les coûts totaux à tel point que la rentabilité économique de l'ensemble du programme a été faible.

Compte-tenu de ce que précède et de l'importance qu'attachent le Gouvernement tunisien et la population de la région considérée à la réalisation du projet, nous espérons que l'USAID participera à son financement dans un délai raisonnable.

Veillez agréer, Monsieur Le Directeur l'expression de ma considération distinguée./.


Ezzeddine CHELBI

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AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I				1. TRANSACTION CODE <input type="checkbox"/> A ADD <input checked="" type="checkbox"/> B CHANGE <input type="checkbox"/> C DELETE		PAF							
3. COUNTRY/ENTITY TUNISIA/USAID				4. DOCUMENT REVISION NUMBER <input type="checkbox"/>		2. DOCUMENT CODE 5							
5. PROJECT NUMBER (7 digits) <input type="checkbox"/> 664-0312		6. BUREAU/OFFICE A. SYMBOL NE B. CODE <input type="checkbox"/> 03		7. PROJECT TITLE (Maximum 40 characters) <input type="checkbox"/> Central Tunisia Rural Development									
8. PROJECT APPROVAL DECISION <input type="checkbox"/> A APPROVED <input type="checkbox"/> B DISAPPROVED <input type="checkbox"/> C UNAUTHORIZED				9. EST. PERIOD OF IMPLEMENTATION YRS <input type="checkbox"/> 5 - <input type="checkbox"/> QTRS <input type="checkbox"/>									
10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)													
A. APPROPRIATION		B. PRIMARY PURPOSE CODE		PRIMARY TECH. CODE		E. 1ST FY 79		K. 2ND FY 80		L. 3RD FY 81			
(1)	FN	200		230	2692	2500	2165	-	2843	1900			
(2)													
(3)													
(4)													
TOTALS				2692	2500	2165	-	2843	1900				
A. APPROPRIATION		N. AGENCY		O. OFFICE		LIFE OF PROJECT		1. PROJECT FUNDING AUTHORIZED		A. GRANT		D. LOAN	
(1)	FN					T. GRANT	U. LOAN	1. LIFE OF PROJECT		2		2	
(2)						7700	4400	2. INCREMENTAL LIFE OF PROJECT					
(3)								C. PROJECT FUNDING AUTHORIZED THRU		FY		7/9	
(4)													
TOTALS						7700	4400						
12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)													
A. APPROPRIATION		B. ALLOTMENT REQUEST NO.		C. GRANT		D. LOAN		13. FUNDS RESERVED FOR ALLOTMENT					
(1)	FN			2692	2500	TYPED NAME (CHKL SER/EM/END)							
(2)						SIGNATURE							
(3)						DATE							
(4)													
TOTALS				2692	2500								
14. SOURCE/ORIGIN OF GOODS AND SERVICES <input checked="" type="checkbox"/> 000 <input type="checkbox"/> 981 <input checked="" type="checkbox"/> LOCAL <input type="checkbox"/> OTHER													
15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED													

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FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE
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PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Country: Tunisia

Name of Project: Central Tunisia
Rural Development

Number of Project: 664-0312

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Loan and a Grant to Tunisia (the "Cooperating Country") of not to exceed five million one hundred and ninety two United States Dollars (\$5,192,000) (the "Authorized Amount") to help in financing certain foreign exchange and local currency costs of goods and services required for the project as described below. Of the Authorized Amount, two million and five hundred thousand dollars (\$2,500,000) ("Loan") will be loaned to the Cooperating Country.

I approve the total level of A.I.D. appropriated funding planned for this project of not to exceed twelve million one hundred thousand United States Dollars (\$12,100,000), of which \$4,400,000 will be Loan funded and \$7,700,000 Grant funded, including the funding authorized above, during the period FY 1979 through FY 1981. I approve further increments during that period of (Loan)/(Grant) funding up to \$6,908,000 subject to the availability of funds in accordance with A.I.D. allotment procedures.

The Project consists of a series of sub-projects, each of which is designed to promote the economic and social development of Central Tunisia. The sub-projects and the amount of funding authorized and approved for each are as follows:

<u>Sub-Project</u>	<u>Authorized Amount</u> (in Millions of \$)			<u>Amount Approved</u> (in Millions of \$)		
	Loan	Grant	= Total	Loan	Grant	= Total
Area Development (312.1)	-0-	1.482	1.482	-0-	4.5	\$4.5
Dryland Farming Systems Research (312.2)	-0-	1.0	1.0	-0-	2.8	\$2.8
Small Farmer Irrigation (312.3)	2.5	.21	2.71	4.4	.4	\$4.8

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority 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:

a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in United States Dollars within twenty (20) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in United States Dollars interest from the date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first ten (10) years, and (b) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Goods and Services

Goods and services, except for ocean shipping, financed by A.I.D. under the Grant shall have their source/origin or nationality in the Cooperating Country or in the United States except as A.I.D. may otherwise agree in writing. Goods and services, except for ocean shipping, financed by A.I.D. under the Loan shall have their source/origin or nationality in the Cooperating Country or in countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. Ocean Shipping financed under the Loan and Grant shall be procured in the United States or the Cooperating Country, except as A.I.D. may otherwise agree in writing.

c. Initial Conditions Precedent

Prior to the initial disbursement, or to the issuance of the initial commitment documents under the Project Agreement, the Cooperating Country, except as A.I.D. may otherwise agree in writing, shall furnish in form and substance satisfactory to A.I.D.:

1) Evidence that the Central Tunisia Development Authority (CTDA) has been physically established in Central Tunisia, is adequately staffed and is performing the functions assigned to it by Law No. 78-44 of August 1, 1978.

2) Evidence that the Government of Tunisia decree implementing Law No. 78-44 has been issued.

3) Evidence that the Cooperating Country has provided sufficient funds in its 1979 budget to finance the first year investment, operating and maintenance costs of the CTDA, including staffing, physical facilities, vehicles and office equipment and Cooperating Country project costs.

d. Covenants

The Cooperating Country shall covenant to apply the same lending procedures and interest rates to the farmer credit portion or the Project as are utilized for the Small Farmer Supervised Credit Project. Other Cooperating

Country covenants shall relate to exemption of import duties, customs clearance, and logistic support for technical assistance contractor personnel.

e. Section 612 (b) Determination

I hereby determine in accordance with Section 612(b) of the Foreign Assistance Act, that (a) the expenditure of United States Dollars for the procurement of goods and services in Tunisia, as authorized above, is required to fulfill the purposes of this project; (b) the purpose of this project cannot be met effectively through the expenditure of United States-owned local currencies for such procurement and (c) the administrative official approving local cost vouchers may use this determination as the basis for his certification as required by Section 612 (b) of the Act.

Administrator

Date

LOAN/GRANT AGREEMENT

The mission will sign a single loan/grant agreement with the GOT covering all the subprojects approved herein and outlining the framework of the entire CTRD project.

Under the Bureau delegation of authority to the field, the regional legal advisor, based in Tunis will undertake the drafting and support the negotiation of this agreement. For this reason, a draft loan/grant agreement is not attached at this time. The mission will have this draft ready in December and will discuss it fully with relevant GOT authorities in anticipation of a signing in late January/early February to coincide with the Joint Commission meetings.

The document will reflect the full intent of all the covenants and conditions precedent attached to the Project Paper and sub-project documents.

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UNCLASSIFIED
Department of State

ANNEX K
NEAC AUTHORIZATION OF PIDS

PAGE 01 OF 03 STATE 246507
ORIGIN A1D-88

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STATE 246507

INFO OCT-01 EB-08 /089 R

DRAFTED BY NE/TECH: JJDALTON:KIC
APPROVED BY AA/NE: JMWHEELER
AA/NE: AMHITE (DRAFT)
SE/DP: BLANGHARD (DRAFT)
NE/MENA: JMCOLL (DRAFT)
NE/TECH: WSELACERT (DRAFT)
NE/FO: STAUERBERG, ATT (DRAFT)
NE/TECH/AD: POLSON (DRAFT)
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E.D. 11652: 4/A

TAGS:

SUBJECT: NEAC REVIEW CTRO PIDS SEPTEMBER 14, 1978

1. FOUR PIDS APPROVED. DETAILED COMMENTS AND QUESTIONS CONCERNING PP CONTENT PROVIDED BELOW. CONCERN PARTICULARLY EXPRESSED ABOUT SCHEDULE FOR PP PREPARATION AND MISSION CAPACITY TO COMPLETE SUCH PREPARATIONS WITHOUT EXTENSIVE EXTERNAL HELP.
2. EACH PID IS TO BE TREATED AS A PROJECT AND JUSTIFIED WITH A SEPARATE PP. THE TWO PIDS CONTAINING GREATEST DEGREE OF DEVELOPMENT APPEAR TO BE DRYLAND RESEARCH AND SMALL-HOLDER IRRIGATION. THE AREA DEVELOPMENT PP AND THE POTABLE WATER PP SHOULD FOLLOW AS RAPIDLY AS POSSIBLE.
3. WITH REFERENCE TO MINISTRY OF PLANNING NOVEMBER 10 DEADLINE ON FUNDING COMMITMENTS, AND NOTING THESE PID APPROVALS WILL BE ACCEPTED AS ADEQUATE EVIDENCE OF AID INTENT TO SUPPORT CTRO. AS USUAL AWARE FUNDING COMMITMENTS CAN ONLY FOLLOW FROM PP APPROVALS AND EVEN THIS IS SUBJECT TO AVAILABILITY OF FUNDS. IF THERE IS NEED FOR FURTHER ASSURANCE HELPFUL TO THE GOT IN ITS PRESENT PLANNING PLEASE ADVISE.
4. ONE ADDITIONAL WAY OF PROVIDING ASSISTANCE TO THE GOT IS TO SPEED THE PREPARATION OF PIDS DURING OCTOBER AND NOVEMBER FOR AUTHORIZATION. MISSION NEEDS YOUR EARLY ASSESSMENT BASED ON REVIEW OF THE QUESTIONS POSED FOR EACH PROJECT BELOW OF HOW MUCH OF THE PP PREPARATION CAN BE DONE BY MISSION PERSONNEL WORKING WITH DEMONEOT AND DOMMEN. PLEASE ADVISE IN THE LIGHT OF OUR ESTIMATE WHICH INCLUDES:
 - A. NICHOLSON, DEMONEOT, AND DOMMEN, ASSISTED BY THE PROGRAM OFFICE WHERE APPROPRIATE, SHOULD BE ABLE TO COMPLETE THE AREA DEVELOPMENT PP DURING OCTOBER OR EARLY NOVEMBER.
 - B. SLUSSER ASSISTED BY DOMMEN SHOULD BE ABLE TO COMPLETE THE POTABLE WATER PP AFTER COMPLETION OF THE CARE/MEDICO SITE SURVEYS AND THE OCTOBER TDY OF BRUCH. NO ROURK TO LOOK AT COSTS, BENEFITS, ALTERNATIVES. THEY SHOULD MEAN

COMPLETION OF A PP SOMETIME IN LATE NOVEMBER OR EARLY DECEMBER.

C. YOUNG WILL VISIT ABOUT OCTOBER 4 IN ORDER TO WORK ON SOME ASPECTS OF DATA GATHERING AND ANALYSIS RELATED TO CTDA FUTURE EVALUATION NEEDS. BINNENDIJK WILL WORK ON THIS ALSO IN EARLY OCTOBER.

D. RADOVIC TDY ON SMALL INDUSTRIES MAY SLIP TOWARDS END OF OCTOBER BECAUSE OF CONTRACTING PROBLEMS. PLEASE ADVISE WHETHER HE SHOULD CONTINUE NEGOTIATING THE TDY FOR SUCH A FINDING.

E. FLEISHER WORKING WITH RUSSELL GREGG ON CREDIT AND UTILIZING LEW CLARK DURING HIS TDY FROM OCTOBER 12-22, 1978, SHOULD BE ABLE TO DEVELOP MUCH OF THE PP'S FOR DRYLAND RESEARCH AND SMALL-HOLDER IRRIGATION. PARTICULARLY IF ASSIGNED BY THE PROGRAM OFFICE AND DEMONEOT/DOMMEN DURING PART OF OCTOBER. THIS SHOULD LEAD TO COMPLETION OF BOTH PIDS DURING EARLY NOVEMBER. IF NECESSARY TO INSURE ADEQUATE COVERAGE OF THESE TWO PP'S, AID/M COULD ALSO PROVIDE ELWINGTON-DALTON DURING TWO WEEK INTERVAL IN OCTOBER. NEED EARLY ADVICE ON THIS BECAUSE OF NEED TO PLAN OTHER SCHEDULES.

5. DRYLAND RESEARCH:

A. THERE IS NEED FOR A VERY CLEAR JUSTIFICATION IN THE STRATEGY STATEMENT CONCERNING WHY THERE IS INITIAL CONCENTRATION ON BARLEY RESEARCH. HOW WILL THE PROJECT

OVER TIME LOOK AT OTHER ASPECTS OF FARMING SYSTEMS? WILL FARMING SYSTEMS BE TREATED BY THE GOT AND OTHER PROJECTS NOW OR ONLY LATER? WHAT INCREASES ARE EXPECTED IN THE OUTPUT AND USE OF BARLEY AND WHAT BENEFITS WILL FLOW TO WHOM OVER TIME? HOW WILL THE PROJECT ADDRESS THE POSSIBLE CROPPING ROTATIONS WITH BARLEY?

B. THE END OF PROJECT STATUS AND LOG FRAME ARE NOT ADEQUATELY PRESENTED. THE PP SHOULD DESCRIBE THE ANTICIPATED END OF PROJECT STATUS IN SPECIFIC AND PREFERABLY QUANTIFIED TERMS. WE ALSO NEED TO LOOK AT THE CONDITIONS NECESSARY TO ACHIEVE THAT STATUS AND IT SHOULD BE DEMONSTRATED THAT SUCH CONDITIONS ARE ACHIEVABLE.

C. THE NEED FOR ANY KIND OF A CREDIT REVOLVING FUND WAS QUESTIONED. ADEQUATE JUSTIFICATION MUST BE SHOWN, AND THERE IS NEED FOR A CLEAR EVALUATION OF HOW SUCH A MECHANISM MIGHT FUNCTION. SOME ISSUES RAISED CONCERNING THE SMALL FARMER SUPERVISED CREDIT PROJECT NEED TO BE ADDRESSED. IF THE CREDIT IS PLANNED ONLY TO OFFSET THE COSTS AND RISKS OF PARTICIPATION BY FARMERS IN THE FIELD TRIALS, COULD THESE COSTS MORE EASILY BE MET THROUGH GRANTS?

D. CAN THE PARTICIPANT TRAINING AND EQUIPMENT INPUTS OF THIS PROPOSED PROJECT BE FUNDED UNDER THE APPROPRIATE TECHNOLOGY TRANSFER PROJECT? SHOULD THEY BE AND IF SO HOW?

E. IMPLEMENTATION RESPONSIBILITIES AND USAID/TUNIS MONITORING AS WELL AS BACKUP OBLIGATIONS NEED TO BE SPELLED OUT. THE PP SHOULD REFLECT A CLEAR UNDERSTANDING WITH THE GOT ON HOW AND WHEN THEY ARE TO ASSUME BUDGETARY AND MANPOWER SUPPORT FOR THE INCREASED PHYSICAL AND INSTITUTIONAL CAPACITIES BEING DEVELOPED. THE PP SHOULD PROPOSE CP'S OR COVENANTS AS APPROPRIATE TO ACCOMPLISH THIS OBJECTIVE.

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F. THE PROPOSED WORK IN THIS PROJECT CONCERNING THE LEKEF INSTITUTE RESEARCH STRUCTURE/ APACITY SEEMS TO HAVE MUCH IN COMMON WITH THE WORK PLANNED WITH LEKEF UNDER THE AGRICULTURAL TECHNOLOGY TRANSFER PROJECT. COULD THIS PROJECT THOUGH SEPARATE IN ITS GEOGRAPHIC AREA CONCENTRATION I.E. CTDR - BE MANAGED UNDER THE APPROPRIATE TECHNOLOGY TRANSFER PROJECT?

6. SMALL-HOLDER IRRIGATION

A. PROJECT AS PROPOSED ACCEPTS EXISTING FLOOD IRRIGATION PRACTICES IN AREA. THESE PRACTICES ARE GENERALLY REGARDED AS INEFFICIENT SYSTEMS FOR UTILIZING WATER. WHY NOT ENGAGE IN DRIP, SPRINKLER, CENTER PIVOT OR OTHER FORMS OF IRRIGATION? PP SHOULD DISCUSS THE ALTERNATIVE TECHNOLOGIES AND PROVIDE DETAILED JUSTIFICATION FOR THE EMPHASIS SELECTED.

B. SIMILARLY, THIS PROJECT PROVIDES LITTLE ATTENTION TO WATER MANAGEMENT EXCEPT BY CTDA WITHIN THE PERIMETERS. WHAT ARE THE TECHNICAL, OPERATIONAL, AND ECONOMIC JUSTIFICATIONS FOR THIS COURSE OF ACTION? IN THIS CONNECTION, WHILE THE CONDITION PRECEDENT CONCERNING EXTENSION SERVICES FOR SHALLOW WELLS SEEMS REASONABLE, SHOULD IT NOT ALSO INCLUDE SERVICES CONCERNING WATER MANAGEMENT?

C. THE WATER MINING IN DJILHA WAS NOTED, AND IT WAS AGREED THAT THIS AREA SHOULD PROBABLY BE DROPPED FROM THE SMALL-HOLDER IRRIGATION PROJECT.

D. WHILE THE SUGGESTED CONDITION PRECEDENT REGARDING RATIONALIZATION OF LAND USE WITHIN THE IRRIGATED PERIMETERS SEEMS REASONABLE, THIS WHOLE AREA OF NEED REQUIRES FURTHER EXPLANATION AND, IN ANY CASE, TERMS LIKE "CONSOLIDATION" SHOULD BE AVOIDED.

E. IT WAS AGREED THAT ALTHOUGH A MARKETING STUDY MAY BE NEEDED AT SOME POINT LATER ON, IT DOES NOT APPEAR TO BE OF SUFFICIENT IMPORTANCE TO BE ESTABLISHED AS A CONDITION PRECEDENT.

F. THE GRANT/LOAN ISSUE SURROUNDING SHALLOW WELL IMPROVEMENTS REQUIRES CLARIFICATION OF TWO KINDS. THE PP SHOULD MAKE IT CLEAR ABOUT THE LEGAL STATUS THAT IS CONVEYED BY A CERTIFICATE OF POSSESSION. CAN TENANTS HAVE CERTIFICATES OF POSSESSION? IF SO, IS THERE NOT A DANGER IN IMPROVING SHALLOW WELLS FOR THOSE HOLDING CERTIFICATES WHEN THE LAND-OWNERS MAY LATER TAKE OVER THE IMPROVEMENTS? WHAT IS THE PROCESS FOR ESTABLISHING CERTIFICATES OF TITLE AND WHAT ARE THE PROSPECTS FOR SPEEDING THIS PROCESS IN THE AREA?

A SECOND SET OF ISSUES SURROUNDS THE PROPOSED CREDIT. WHY ISSUE CREDIT AT SUCH LOW TERMS TO ENTERPRISES THAT ARE OBVIOUSLY GOING TO OBTAIN A HIGH RATE OF RETURN? IF CREDIT IS JUSTIFIED, COULD THIS BE RELATED TO THE SMALL FARMERS' SUPERVISED CREDIT PROJECT? IF NOT, PLEASE EXPLAIN IN SOME DETAIL JUST HOW THE CREDIT PROGRAM WOULD FUNCTION.

G. THE PP SHOULD DISCUSS WHO WILL MAINTAIN THE IRRIGATION SYSTEMS. THERE WAS A STRONG FEELING THAT THIS MIGHT BEST BE HANDLED LOCALLY RATHER THAN CENTRALIZED IN A GOVERNMENT MINISTRY.

H. THE FUNDING ARRANGEMENT FOR THE IRRIGATION SUBPROJECTS NEED TO BE SPECIFIED IN THE PP. ARE WE TO REIMBURSE THE GOT? IF SO, HOW, ON WHAT BASIS, AND AT WHAT INTERVAL?

I. WHAT KINDS OF EXTENSION SERVICES WILL BE PROVIDED

TO THE SMALL-HOLDER IRRIGATORS? HOW WILL THEY BE PROVIDED? WILL THERE BE A WORK PLAN IN THE PP OR WILL IT CALL FOR PREPARATION OF SUCH PLANS DURING THE FIRST MONTHS OF THE PROJECT?

J. QUESTIONS WERE RAISED ABOUT THE EXTENT OF LOCAL PARTICIPATION IN THIS AS WELL AS THE OTHER THREE PROJECTS. THERE IS NEED TO OUTLINE WHAT MAY BE ACCOMPLISHED IN THIS MATTER PARTICULARLY IN THE LIGHT OF THE OBSERVATIONS BY HOPKINS.

K. IN DISCUSSING THE ENVIRONMENTAL ASPECTS OF THIS PROJECT AS WELL AS THE OTHERS, IT WAS AGREED THAT THE VARIOUS IID'S SHOULD BE REVIEWED TOGETHER AND LINKAGES NOTED WHERE APPROPRIATE. PROBABLY THE BEST WAY TO PROCEED WOULD BE TO ESTABLISH A NEGATIVE DETERMINATION SUBJECT TO A GENERAL ENVIRONMENTAL ASSESSMENT AFTER AUTHORIZATION.

L. AGAIN, THERE IS NEED FOR QUANTIFIED OUTPUTS AND EPS IN A CLEARLY DEFINED LOG FRAME TOGETHER WITH AN ANALYSIS OF HOW IMPLEMENTATION WILL TAKE PLACE AND WHAT MONITOR/BACKUP RESPONSIBILITIES WILL BE PLACED ON CTDA AND USAID/TUNISIA.

M. QUESTIONS WERE ASKED AS TO WHETHER MISSOURI COULD HANDLE THIS ACTIVITY. AT LEAST FOUR OPTIONS REQUIRE EXPLORATION. ONE WOULD BE TO TIE THIS PROJECT MANAGERIALLY TO WHATEVER IS DONE ABOUT THE ARRANGEMENTS FOR DRYLAND RESEARCH. ANOTHER WOULD INVOLVE AMENDING THE AGRICULTURAL TECHNOLOGY TRANSFER PROJECT. A THIRD MIGHT CONCERN TYING INTO THE DSB/RAD COOPERATIVE AGREEMENT FOR AREA DEVELOPMENT IN A WAY THAT WOULD PROVIDE THE NECESSARY ADVICE/TRAINING. A FOURTH WOULD BE TO TACKLE BOTH THE DRYLAND RESEARCH AND THIS PROJECT THROUGH A TITLE XII ARRANGEMENT. WE NEED YOUR EARLY ADVICE ON THESE MATTERS BECAUSE IF DECISION IS TO FOLLOW TITLE XII ROUTE THEN MEASURES SHOULD BE TAKEN SOONEST SO AS TO ENGAGE CHOSEN INSTITUTION IN PP DESIGN STAGES.

7. POTABLE WATER:

A. THE IDEA OF INCLUDING THREE SEPARATE ACTIVITIES IN A SINGLE PP WAS APPROVED.

B. THE SERIOUSNESS OF THE PROBLEM CONCERNING DIFFERING AND POSSIBLY INAPPROPRIATE TUNISIA AGENCY STANDARDS FOR POTABLE WATER PROJECTS WAS RECOGNIZED. IT WAS SUGGESTED THAT THIS PP OR THE AREA DEVELOPMENT PP MIGHT PROVIDE FOR A CAREFUL STUDY OF APPROPRIATE, LOW-COST, CONSTRUCTION TECHNIQUES AND STANDARDS FOR THE AREA. THE STUDY COULD BE USED AS THE BASIS FOR "FRANCHISING" US FUNDS SO AS TO ENCOURAGE EFFECTIVE TUNISIAN ACTION.

C. THERE IS NEED FOR BOTH A CONCISE STRATEGY STATEMENT AND A DESCRIPTION OF HOW CTDA WILL CAUSE EACH PARTICIPATING AGENCY TO FOCUS ON THE PROBLEM OF LOWERED COSTS FOR WATER SUPPLIED TO A DISPERSED POPULACE.

D. THE PP SHOULD IDENTIFY THE POTABLE WATER RELATED HEALTH ISSUES, AND DISCUSS HOW THEY WILL BE ADDRESSED AND BY WHOM.

E. SIMILARLY THE PROBLEM OF SANITATION/WATER DISPOSAL NEEDS TO BE COVERED BY THE PP.

F. THE PROBLEMS OF SYSTEM MAINTENANCE NEEDS PARTICULARLY URGENT ATTENTION AND THE OPPORTUNITIES FOR LOCAL PARTI-

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CIPATION SHOULD BE MAXIMIZED.

BURDENS UPON MISSION STAFF, AND SINCE ADDITIONAL PROJECTS

G. THERE IS NEED FOR CLEARLY DEFINED EOPS AND OUTPUTS IN A LOG FRAME WHICH SHOWS THE INTERRELATIONSHIPS BETWEEN THE VARIOUS PROGRAMS AND THE INSTITUTIONALIZATION OF CTDA CAPACITY TO ESTABLISH AND ENCOURAGE POTABLE WATER POLICY FOR THE AREA.

IN HEALTH, EDUCATION, AGRICULTURE, ETC. ARE YET TO BE PLANNED, THERE IS NEED TO SHOW HOW MISSION TUNISIAN AND AMERICAN PROFESSIONAL, CLERICAL, AND ADMINISTRATIVE STAFF WILL BE TASKED TO SUPPORT THE ENTIRE CENTRAL TUNISIAN RURAL DEVELOPMENT PROGRAM OVER TIME. PERHAPS USE OF MISSION PROJECT COMMITTEES WITH APPROPRIATE CHAIRPERSONS MAY BE HELPFUL. AN IMPORTANT CONSIDERATION IN NEAC REVIEW OF THE INCOMING PP'S WILL BE PRESENTATION OF A MISSION MANAGEMENT AND STAFFING PLAN WHICH CLEARLY SHOWS CAPACITY TO SUPPORT THE CTDR EFFORT AND ASSIGNMENT OF ALL MISSION PERSONNEL TO SPECIFIED RESPONSIBILITIES CONCERNING CTDR. CHRISTOPHER

B. AREA DEVELOPMENT:

A. THE PLANNING/DESIGN UNIT WITHIN CTDA SHOULD ALSO BE TASKED AND TRAINED TO PERFORM EVALUATION ACTIVITIES, AND THE PP SHOULD SHOW CLEARLY HOW DATA OBTAIN FROM VARIOUS SOURCES WILL BE PROCESSED WITHIN CTDA N W A S THAT WILL BE FED BACK INTO OPERATIONS.

B. THE PP SHOULD SHOW WHERE AND HOW THE PLANNING/DESIGN UNIT WILL FIT WITHIN THE CTDA ESTABLISHMENT AND EXPLAIN THE MEANS BY WHICH IT IS HOPED THAT SUCH A UNIT WILL HAVE AN EFFECTIVE INFLUENCE UPON CTDA POLICIES AND OPERATIONS.

C. THE KINDS OF SKILLS REQUIRED IN THE CTDA PLANNING/DESIGN UNIT SHOULD BE DESCRIBED TOGETHER WITH AN EXPLANATION OF WHERE SUCH SKILLS MAY BE RECRUITED IN TUNISIA AND HOW PARTICIPANT TRAINING AND LONG-TERM TECHNICAL ADVISORY ASSISTANCE WILL CONTRIBUTE TO THE DEVELOPMENT OF THOSE SKILLS.

D. IMPLEMENTATION ARRANGEMENT FOR LONG-TERM AND SHORT-TERM TDY ASSISTANCE SHOULD BE DESCRIBED IN AS MUCH DETAIL AS POSSIBLE TOGETHER WITH AN EXPLANATION OF HOW MUCH MONITORING OR BACK-UP SUPPORT WILL BE REQUIRED FROM THE MISSION.

E. THE PILOT PROJECT FUND SHOULD NOT BE JOINTLY ADMINISTERED BY THE GOT AND USAID. THE PP SHOULD SET FORTH THE CONDITIONS AND CRITERIA FOR USE OF THIS FUND BUT WE WANT THE TUNISIAN'S TO BE RESPONSIBLE. THE FUNDS MIGHT ALSO BE TRANCED TO PROVIDE FOR EX POST REVIEW OF TUNISIAN ACTIONS.

F. THE OVERALL STRATEGY FOR AREA DEVELOPMENT PLANNING AND OPERATIONS THROUGH THE VENUE OF CTDA AND LINKED TO THE VARIOUS AID-ASSISTED ACTIVITIES (AS WELL AS WORLD BANK, BOT, AND OTHER OPERATIONS) NEEDS TO BE STATED CLEARLY. THIS SHOULD BE LINKED TO EOPS AND OUTPUTS WHICH ARE QUANTIFIABLE IN SOME CASES AND/OR SHOW INSTITUTIONALIZATION IN OTHER CASES.

G. THE PROPOSED DSB/RAD LINKAGE OF THE UNIVERSITY OF WISCONSIN WITH THIS PROJECT APPEARS PROMISING. THERE IS NEED TO DESCRIBE HOW THIS WILL FUNCTION IN TERMS OF SKILLS PROVIDED, TIMING, TRAINING PROVIDED, MANAGEMENT, FUNDING, AND THE EXTENT TO WHICH THE MISSION WILL BE EXPECTED TO MONITOR/SUPERVISE/OR BACK-UP THESE OPERATIONS.

9. IT WAS NOTED THAT ALL FOUR PID'S SEEM TO INVOLVE A LARGE NUMBER OF SHORT-TERM AND INDIVIDUAL PROCUREMENT ACTIONS. THESE CAN BE EXPENSIVE IN TERMS OF NECESSARY BACK-UP ACTIONS AND SUPERVISION BY DIRECT-HIRE STAFF. EACH PP SHOULD BE DESIGNED TO MAXIMIZE TUNISIAN PROJECT MANAGEMENT. HOST COUNTRY CONTRACTING SHOULD BE USED EXCEPT IN THE CASE OF THE DSB/RAD COOPERATIVE AGREEMENT WITH WISCONSIN. WHERE TUNISIAN MANAGEMENT IS ANTICIPATED AS WEAK THEN THE PP DESIGN SHOULD BE ADJUSTED WITH EMPHASIS UPON REMEDYING SUCH SITUATIONS IF APPROPRIATE.

10. SINCE THESE FOUR ACTIVITIES WILL IMPOSE CONSIDERABLE

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ANNEXES TO CENTRAL TUNISIA AREA DEVELOPMENT SUB-PROJECT PAPER

- Annex A - Log Frame (attached directly to sub-project paper)
- Annex B - Position Descriptions for Senior Regional Planner and
Agricultural Planner
- Annex C - Formula for Investment-Selection in CTRD Pilot Economic
Projects
- Annex D - Potable Water Strategy

POSITION DESCRIPTION FOR SENIOR REGIONAL PLANNING
ADVISER TO CTDA UNDER THE UNIVERSITY OF WISCONSIN
CONTRACT

QUALIFICATIONS:

1. PhD or experience equivalence in any one of the following fields:

regional planning, regional science, economic geography or systems engineering.

2. Excellent speaking and reading and satisfactory writing ability in French (S4 + R4 FSI tested).

3. At least seven years of professional planning experience in a public regional planning agency, at least two years in a supervisory and/or administrative role. Some of this experience should have been either in a developing country or in a predominantly rural regional planning agency in one of the arid or semi-arid states of the US.

4. Demonstrated capability for dealing with complex, multisectoral development problems at a regional scale including program and project design implementation and evaluation.

5. Demonstrated substantive knowledge of general development, theories and the respective roles of rural development, economics and resource scarcity in these theories.

RESPONSIBILITIES:

The Senior Regional Planning Advisor:

1. Will serve as staff advisor to the Chief of the Evaluation's Planning Unit (EPU) of the CTDA on all aspects of the EPU's work and its day-to-day operations.
2. Will advise on the EPU work program design, monitor and evaluate work progress and the performance of individual staff members.
3. Will participate in the selection of pilot and/or experimental projects and participate in project design, monitoring and evaluation.
4. Will control the allocation of the US component in the proposed Experimental Project Fund and participate in the approval of funding for projects from that fund.
5. Will make recommendations for short term consulting services,

write specifications for such services and facilitate the effective utilization of these services.

6. Will monitor the EPU staff development, participate in the design of training program components, select work related test assignments, administer such tests and participate in their evaluation.

7. Will supervise the work of the Agricultural Planner and any Tunisian administrative staff under the University of Wisconsin Contract when the Agric Planner is not able to do so.

8. Will maintain continuous liaison with the RDA office of USAID.

9. Will report directly for information, advise, consultation and major decision approval to the University of Wisconsin Project Co-Directors.

POSITION DESCRIPTION FOR RESIDENT ADVISORS

POSITION DESCRIPTION FOR AGRICULTURAL PLANNER ATTACHED
TO CTDA UNDER THE UNIVERSITY OF WISCONSIN CONTRACT

QUALIFICATIONS:

1. PhD in any one of the following fields:

agricultural economics, geography, agricultural planning,
agricultural administration.
2. Fluent in French - tested by FSI at the S4, R4 level and able to write technical reports in French.
3. Field research and/or operational experience dealing with agricultural production systems in developing countries.
4. At least three years experience since the PhD in the analysis, planning and extension of agricultural production systems.
5. Proven ability to apply risk analysis techniques to small farmer systems.
6. Familiarity with the problems of agricultural production and natural resource management in arid and semi-arid regions (whether rain-fed or irrigated).

RESPONSIBILITIES:

1. He will act as advisor in agricultural production and natural resource use to the senior American resident regional planner attached to the Evaluation and Planning Unit (EPU) of the CTDA. He will perform such duties as assigned to him by the senior planner in the following areas:
 - (a) Design and analysis of research on cropping patterns, agricultural production systems, and the organization of extension to utilize the results.
 - (b) Design and analysis of survey research on farming systems, land use patterns, ecological problems, on-farm water use, and related subjects. This will be done in consultation and cooperation with the Cornell University team responsible for the establishment and maintenance of the CTDA data system.
 - (c) Design and analysis of experiments to evaluate risk levels of alternate farm systems and apply probabilistic tests to

establish optimal risk parameters for dryland farming systems in Central Tunisia.

- (d) He will have particular responsibility for advising the senior planner regarding the social and ecological soundness of proposed agricultural interventions with particular reference to the suitability of the interventions by the poorest farmers.

2. The Agricultural Planner will have the responsibility of assisting the EIU in developing the CTDA's capacity to integrate and exploit complementarities among such factors as cropping patterns, family labor use, marketing patterns, agro-industry, and public investments, and among the several agricultural projects being implemented in the Central Tunisia region. He will train the EIU staff in the application of risk analysis and other probability methodologies to do evaluation of agricultural systems.

3. The Agricultural Planner will have the responsibility of maintaining liaison between the Senior Regional Planner and the agricultural divisions within CTDA, the agricultural research institutes, and the RDA office of the USAID in Tunis.

4. The Agricultural Planner will serve as the business manager of the local-hire administrative/logistics staff. He will hire, supervise and advise this staff and prepare their overall policy guidance.

FORMULA FOR INVESTMENT-SELECTION: IN CTRD PILOT ECONOMIC PROJECTS

Productivity with an Equity Bias

In keeping with overall AID policy guidance on development assistance and the more specific AID guidance on assistance to the "middle-income" countries and rural development, the CTRD must integrate the dual concerns of productivity (or "growth") and distribution (or "equity") in a manner which insures that the primary benefits of US assistance are effectively directed toward the poorest sectors of Tunisian society in a manner which concentrates on improving the basis for self-sustained economic growth in this poor sector.

In the Tunisie Centrale region we are dealing with four principal strata of rural population, none of which is rich, but among which there are wide differences in income levels. Very roughly these strata are as follows:

STRATA	No. of Households	% of Total	Per Capita Income Av.	Present Per Cap Income as % of National Av.
IRRIGATED PERIMETER FARM FAMILIES	2500	8%	TD100	34%
SURFACE-WELL FARM FAMILIES	1500	5%	TD160	53%
TOWN RESIDENTS & GOVT OFCRS (FAMILIES)	1000	3%	TD300	100%
DRYLAND FARM FAMILIES	2500	84%	TD 30	10%

1. This is a further reduction of the CTRD beneficiary analysis simplified to facilitate the demonstration of the formula.

In making choices among investment targets involving these strata we do not want to arbitrarily exclude any element of the target population (except the small middle-class group, unlikely to be directly impacted upon by an RD project, anyway). At the same time, we do not want "banker's logic" to direct all our investment in the most prosperous **strata** where the potential rate of return on capital is probably highest. To do so would be to violate all three of the policy guidelines cited above. How then can we approach the problem of making rational investment choices among projects aimed at these various sectors which will keep our primary focus on the poorest elements without ruling out some very high-potential intervention which impacts primarily on the more prosperous elements of the target population.

We are proposing the use of an Investment Formula for rank-ordering potential project interventions of an income generating nature on the basis of both productivity and distribution, but with the bias towards equity. The underlying principle of this formula would be to make the percentage of increase in the household income of the beneficiaries of any given investment the basic yardstick for ranking the range of possible investment possibilities. Instead of taking Internal Rate of Return (IRR) as the basic criterion in the conventional way where two projects which each promised a return on investment of 5% per year would be ranked equally, this approach would rank equally two projects which would have the same rate of household-income increase for the beneficiaries. For example, an intervention which would raise the annual household-income of a group of farmers on an irrigated perimeter from TD1000 to TD1100/year (that is, an increase of 10% in annual household-income) would rank equally with an intervention which would raise the average income of a group of dryland farmers from TD300 to TD330 (also a gain of 10%). In other words, a 30 Dinar gain in income for the poorest farmers would be judged as equal to a 100 Dinar gain for the irrigated farmers.

The device for scaling a wide range of project proposals would require that each proposed intervention clearly identify the number of beneficiaries, the project income changes from the intervention and the total investment cost. Then by taking the percentage of projected income gain (10% in the example above), squaring that number to give geometric weight to the distribution element, and dividing the result by the per capita investment cost, we would arrive at an Equity/Production Coefficient (EP Coefficient) for each project. All the proposed interventions could be scaled by the EP Coefficient and selections could be made within parameters appropriate to the project goals and project scale (as well as our technical capacity to implement). In short, the formula would provide a systematic

(and rational within the terms of AID policy objectives) manner of selecting among very different kinds of project interventions without arbitrarily ruling any class of projects "in" or "out" of our scope of considerations. The actual formula would look like this:

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$$\left[\frac{\Delta I}{I_0} \right]^2 C^{-1}$$

I_0 = original percapita income of target group
 ΔI = change in percapita income of target resulting from project
 C = per capita investment cost

Let us look at the operation of this tool in four hypothetical cases to see how it could be used to make investment judgements among diverse options:

- Example No. 1 - A dryland improved barley production package which could be delivered to TD 300 yr farmers at a total investment cost of TD 500 and would increase their average household income to TD 330.
- Example No. 2 - A water-retention and water spreading intervention in an upland valley which could shift 6 farm families from dryland to irrigated farming and move their income levels from TD 300 to TD 600 - per capita investment of TD 3000.
- Example No. 3 - A water management intervention involving improved gates and field channels on an irrigated perimeter which would move average household income from TD 800 to TD 1200 - Investment of TD 1500 per capita.
- Example No. 4 - Introduction of a horticultural package of practices on an irrigated perimeter at a cost of TD 500 per farmer which would raise average incomes from TD 1000/yr to TD 1100/yr.

Application of the formula would rank the projects as follows:

- Example No. 1 - $\left[\frac{30}{300} \right]^2 \times 500^{-1} = 2.00 \times 10^{-5}$
- Example No. 2 - $\left[\frac{300}{600} \right]^2 \times 3000^{-1} = 33.33 \times 10^{-5}$
- Example No. 3 - $\left[\frac{400}{1200} \right]^2 \times 1500^{-1} = 7.40 \times 10^{-5}$
- Example No. 4 - $\left[\frac{100}{1000} \right]^2 \times 500^{-1} = 2.00 \times 10^{-5}$

FINAL RANKING OF THE FOUR INVESTMENT CHOICES:

Example No. 2 (EP Coefficient of 33.33)

Example No. 3 (EP Coefficient of 7.40)

Examples No. 1 and No. 4 (EP Coefficient of 2.00) Both raise incomes 10%.

This provides a systematic and rational way of sorting out the four proposed interventions and ranking them in relation to AID policy objectives. Other factors would of course be considered before final investment, but the model forces a recognition of the equity issues.

This formula was consistently applied by the agricultural assessment and feasibility teams in the analysis of farm budgets, irrigation investment alternatives, and in the final selection or recommended interventions for CTRD.^{1/}

It is intended that the approach be refined and expanded during the area development project, and that the intent of directing policy attention directly toward equity issues in the entire CTRD project be preserved and strengthened.

^{1/}See computations and worksheets in: Cromwell et al, "Agricultural Assessment of Central Tunisia" for fully elaborated examples of application of the Blackton EP Coefficient.

POTABLE WATER STRATEGY

This strategy is the core of the next subproject proposed for CTRD (expected submission Spring 79). It will integrate inputs from the Area Development subproject into a program of investments in the potable water sector.

The purpose of this subproject will be to make cleaner water available to more than half the population of the project area, including as many of the most disadvantaged as possible, thereby beginning to fulfill a necessary condition for the improvement of health in general.

Besides upgrading the potable water infrastructure of the project area in fulfillment of the above purpose, the subproject proposes to improve the CTDA's capability for rapidly and cost-effectively meeting the needs of the population of Central Tunisia for potable water. Notably, the subproject seeks to foster within the GOT an awareness of the need for enunciating at the regional level a potable water policy designed to meet those needs. This means the creation and adoption of a rational methodology for selecting potable water projects and for assigning tasks to the implementing agencies concerned.

The subproject is based solidly upon the proven capabilities of SONEDE, Genie Rural and CARE-Medico to implement potable water projects, and seeks to reinforce these capabilities where possible. Moreover, by means of its administrative centralization in the CTDA, the project aims at an efficient division of labor among these three organizations.

Costs and benefits of potable water investments proposed for implementation are to be examined and re-examined throughout the life of the overall project. In order to induce the CTDA to require each of the implementing organizations to focus in a continuous and systematic way on this matter, the project will use the AID-financed inputs in a step-by-step manner in concert with performance criteria. These criteria will be tightened up progressively over the life of the overall project. The process of "tranching" AID inputs in this way is expected to lead to greater cost effectiveness, through more flexible and innovative use of technologies available, through cost-saving methods of operation, and so forth, and thus to more effective ways of meeting the needs of a water short and dispersed population.

There are not enough resources available to meet the potable water needs of people of the project area in their entirety. Selection among potential projects thus becomes unavoidable. The question is how to make such a selection. USAID has begun the process of identifying selection criteria but the EPU of the CTDA will carry this process on under the potable water subproject and the Area Development subproject.

One means of selection from a long list such as that of Genie Rural is by ranking the potential projects according to their cost per beneficiary, from the lowest cost to the highest. The cost of a potable water project can be estimated on the basis of engineering data and previous experience. The number of beneficiaries from such a project can also be estimated. Therefore, a cost per beneficiary can always be calculated. This cost figure serves as an important indicator of rank.

The value of the cost per beneficiary depends on the interplay of three factors: 1) the natural environment; 2) technology and; 3) demography. Each will be discussed in turn.

The natural environment determines the engineering difficulty of providing potable water. In the terrain conditions of Central Tunisia, the level of engineering difficulty is generally high. This directly biases upward the cost of potable water projects in the area in comparison, say, with the coastal plain.

Different technologies exist for providing potable water to rural populations, and the ones commonly used in Central Tunisia are described in the Potable Water PP. In the project area, a premium attaches to finding and using the simplest possible technology for bringing potable water within reach of the household by reason of the fact that simple technology is easier to maintain than complicated technology. Difficulty of technology and therefore difficulty of maintenance translates directly into down-time and therefore absence of water from the source affected. The hand pump designed by CARE-Medico for use on its wells was the fruit of years of experience with maintenance problems with a wide variety of pumps. The absence of electric transmission lines and the haulage problem affecting diesel fuel are serious constraints to wider application of motorized pumps in the project area; nevertheless, where such facilities exist and where their costs are within reach of the people, such pumps can be used with the advantage of lowered costs per cubic meter of water produced.

The population to be served by a water project is the denominator in the calculation of cost per beneficiary. A low-cost water project that serves very few people, either because few inhabit the surrounding area or because alternative water sources are accessible, will still show a high cost per beneficiary, and therefore will rank low on the list of projects to be selected, other things being equal. Moreover, the benefits of potable water projects are so diverse that in order to estimate the number of beneficiaries in a meaningful way a crude population figure in the denominator may not suffice. Thus, the CTDA may wish, with appropriate technical assistance, to experiment with various schemes to classify the beneficiaries of potable water projects in its area of responsibility according to some criteria of benefits conferred. A crude scheme might involve classifying the population according to access to water measured in terms of distance and/or time; a more sophisticated scheme would take into account such differences as cleanliness of water, taste, and reliability of the source.

Then the effect of a project could be measured in terms of moving so many people from Class III to Class II and from Class II to Class I, with an appropriate scale of weightings, the sum of which might be the actual denominator in the calculation of the cost per beneficiary.*

Cost per beneficiary data do exist at the present time for projects that have actually been implemented in the project area, especially in the two delegations of Maktar and Rohia where all three organizations (SONEDE, Genie Rural, and CARE-Medico) have worked in close cooperation with AID. Data of this type can no doubt be refined and improved with further experience in Central Tunisia to serve as a valuable instrument of rational allocation of development resources.

The CTDA's EPU will make use of these data, as a first approximation, to establish preliminary criteria for approval of potable water projects for implementation under the CTDA's authority. The project proposes (on the basis of recommendation made by two Louis Berger consultants; Philip Roark and Richard Brush) that SONEDE be limited to implementation of potable water projects in agglomerations of over 3,500 persons, at least until SONEDE is able to provide additional information on the beneficiaries from its projects. The reason given is that a study of available SONEDE data shows that costs per capita and costs per cubic meter of water begin to rise significantly below that size agglomeration.

With respect to Genie Rural and CARE-Medico projects, it is proposed to establish ceilings of cost per beneficiary for each of the types of available technology. Only projects costing below these ceilings would then be approved for implementation under the CTDA's authority. This use of the method of cost-per-beneficiary project selection will obviously induce application of the appropriate technology at each particular project site. Where the cost of reconstructing a wide-mouth shallow well at a particular site proves to be prohibitively high, the need for potable water may be met by applying a drilled-well technology at a permissible cost; if even this proves too costly, resort may be had to the hand-auguring technology identified by Roark and Brush, or some such lowest-cost technology.

It is proposed to set the ceiling for each type of technology fairly high in the initial year of the CTDA program, with the aim of weeding out those projects that have an exorbitantly high cost. This will allow a suitable amount of human judgement to enter in to consider the merits of particular cases of extreme hardship where costs of any technology may be high. As the EPU gains further experience however, these ceilings will be progressively lowered.

* It is evident that application of this methodology depends on availability of reliable population density data in the project area. Such data are lacking at the present time. However, see Dr. Annette Binnendijk, "Evaluation Plan for the CTDA Projects", Report to USAID, Oct. 12, 1978, page 2, where population density data are listed at the top of the list of data requirements. Such data will have many uses other than planning potable water development.

ANNEXES TO SMALL-HOLDER IRRIGATION - SUB-PROJECT

Annex A - Log Frame (attached directly to sub-project
paper)

Annex B - Detailed Credit Documentation and Procedures

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ANNEX B

DETAILED CREDIT DOCUMENTATION AND PROCEDURES

For obtaining credit, the following procedure and documentation will be required:

1. Application for loan must be presented through the credit section of CTDA (to be developed as part of the extension program and with the assistance of the supervised credit program staff).

2. The application must be accompanied by:

a. A certificate of possession for the land.(or full title.). The certificate of possession reasonably establishes that the land is in fact under the control of the farmer and that it serves as sufficient evidence to provide loan security and a reasonable expectation that possession of the land will not be challenged.

b. A statement from the Caisse Locale de Credit Mutuel (if any) that the applicant has no past due loans.

c. Supplier's proforma invoice for labor or equipment.

3. Processing of the loan by the credit office will provide the following certifications prior to loan grant:

a. Engineering certification that the additional well will not cause excessive drawdown of the existing aquifer.

b. Engineering certification that the well is sufficiently removed from existing wells so as not to cause localized drawdown of water supplies.

c. Engineering certification as to size and type of pumping installation to be made.

d. Engineering certification that the well is properly located on the property so as to be useful for its intended purpose.

e. General evaluations as to the market potential for crops to be produced.

4. The credit office of the CTDA will be responsible for:

a. Receiving and processing the loan applications.

b. Certification that the well has been dug.

- c. Preparing a financial statement as to repayment potential.
- d. Convening the credit committee for final loan action.
- e. Assisting the farmer in collecting the necessary documents to support the loan application.

ANNEXES TO DRYLAND FARMING SYSTEMS RESEARCH -
SMALL-HOLDERS - SUB-PROJECT PAPER

Annex A - Log Frame (attached directly to sub-project
paper)

Annex B - Request for Proposal

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REQUEST FOR PROPOSAL

Supply of Technical
Services for Dryland
Farming Systems and
Small Farmer Irrigation
Subcomponents of the
Central Tunisia
Rural Development
Project

by

US Land Grant University

to

The Central Tunisia Development Authority

FOR HOST COUNTRY CONTROL
BY THE GOVERNMENT OF TUNISIA

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410 141 00 description

a. Objective

To collaborate with the government of Tunisia and USAID/Tunis to:

(1) maximize the production and income returns to dryland farming in the degraded semi-arid lands of central Tunisia;

(2) develop and extend packages of dryland farming technology specifically designed (principally based upon barley and wheat production) for some 25,000 small holder families in central Tunisia

(3) institutionalize - establish the technical basis for a continuing drylands adaptive research/extension system for technical development of agriculture in central Tunisia; and

(4) improve agricultural utilization of limited ground - water resources in central Tunisia in conjunction with a program of small farmer irrigation.

b. Background

OTD 001 Dryland Farming Systems

5 years

\$4.0 million

This sub-project is planned to assist the OTD development and extend a package of dryland farming technology adapted to the poor soils and less than 400 mm annual rainfall in the project zone. Project includes equipment for two mobile drylands agriculture field laboratories, short term training, support for the staff of the World Cereals Institute in U.S. and international institutions working in semi-arid agriculture and technical assistance for a U.S. university in both applied drylands barley and forage research and in the techniques of developing whole systems of drylands farming, extendable to and usable by small farmers. This project recognizes the absence of any viable extendable Tunisian agricultural technologies for the OTD zone and the fact that the development of a field proven technology must precede any longer term investments, public or private, on unirrigated farms in the zone (which account for over 75% of the OTD zone households). Funding includes resources to cover the "test" period before the new technology becomes bankable through conventional sources by reimbursing participating small farmers for experimental costs.

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CTRD 002 Small Farmer Irrigation

5 years

\$4.6 million

Groundwater is the only significant CTRD zone resource which is still underutilized. This sub-project aims at optimizing access to unutilized groundwater by small farmers. Three types of irrigation interventions are planned: (a) those relating to developing or improving shallow wells (each irrigating 1 to 5 hectares for a single household); (b) those relating to development or improving deep well perimeters (composed of a number of individual farm plots ranging from 1 to 20 hectares per household); and (c) improved utilization of natural springs in uplands areas (each with a potential of providing about one hectare of irrigated land to each of two to four households).

This project will also include a Technical assistance component in the form of a contract (sub-component of the drylands contract) with a land grant institution to provide limited advisory services in the areas of on farm water use and water management. This component is planned to consist of up to 6 months a year (32 man-months maximum) over the life of the project including limited water management field trials and short term training of Tunisian technical staff. Funding includes small farmer credit for the technical components of private surface wells.

C. Scope of Technical Services

(1) Project Design Phase

The design of the two agricultural activities has been completed. The contractor will only be required to assist with minor adjustments to those components of the two activities identified by the project committee as needing modification.

(2) Project Implementation Phase

a. General

The contractor will be responsible for assisting the Central Tunisian Development Authority (CTDA) in establishing and developing the drylands farming systems activity and providing technical advice under the small-holder irrigation activity. His role will be that of providing advisory and consultative technical services. The resident

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senior contract advisor will be stationed in Le Kef working with the Le Kef Agricultural Institute which has agreed to perform the required drylands research for CIDA. He will also handle all A.I.D. project assistance for the irrigation activity.

The drylands research component is the overwhelming priority in selecting a contractor. The contractor must have proven extensive experience in barley research under semi-arid conditions (this cannot be a skill which they plan to subcontract for elsewhere) - this is the core of the program.

The contractor must have a proven record of professional interaction with the international drylands research establishment (CERAT, ICARDA, ICARSA, etc). We expect that the bulk of short term training provided to Tunisians will be carried out at these types of institutions not in the US (both because of language and because the problems of applied barley and semi-arid cereals research in the U.S. are, for the most part, simply not comparable.

The contractor must be able to show that several potential short-term consultants have both international drylands agricultural experience a professional working ability in spoken French and a professional reading ability in French adequate to handle the full range of technical documents in their field. Tunisian counterparts do not speak English and interpreter services are not available.

The contractor should show a capacity being responsive to the low-cost, small farmer orientation of the whole project. This will require the capacity to identify and define the real constraints of the of small farmer and tailor a research program to these constraints.

Contract Services under the Irrigation Activity

These are important, but clearly are secondary to the drylands research work. Any strong university or consortium of universities which can fully meet the drylands requirements should be able to handle the (up to) 54 man months of on-farm water use and water management. Contractor should be able to show that they can provide at least one technical consultant in each of these two areas who can work independently in French (this assumes the use of some additional consultants in highly specialized areas who will not be French qualified). Sub-contracts are possible for this activity, but should not be necessary.

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Limited use of graduate student time to meet contract terms is acceptable on the following conditions:

Graduate students will be the candidates who have met all degree requirements, except the thesis, and speak and read French.

Graduate student time will be counted on a 4mm = 1mm of faculty time basis.

Details of exactly what short-term services are provided to Le Kef Institute should be left flexible so that the contracting institution and Le Kef can work that out during the first year of operations. USAID is procuring the basic field equipment for the project (see list attached) contractor will be responsible for all additional procurement. The Drylands Farming Systems contract will specifically direct the contractor to concentrate the applied cereals research on developing a range of "packages" which are implementable by the poor farmers of the area as well as the richer ones. This means, for instance, that variety selections will probably have to stress hardiness under an extreme range of rainfall conditions and very broad tolerance of moisture stress over maximum yield potential. Farmer preference for good straw yields will have to be taken into account in variety selections, too. The basic point is that the contractor's terms should clearly indicate that their job is not to come up with a theoretical "best" package for the region which almost nobody can implement, but to use the research-extension links to keep the research effort tied directly to the realities of the small dryland farmer situation in the project area (this is important because Le Kef Institute has so far been serving a much more technically advanced and richer clientele in Beja and Le Kef).

The Irrigation project calls for short-term consulting services in on farm water use and water management. This will require working directly with CTDA in the testing and evaluation of water management components ~~in~~ serving the irrigated lands (public and private) of the project area.

In effect the Director of Le Kef will be the control point for the on the drylands work, and the head of the CTDA will be the control point for the irrigation services. The long-term advisor at Le Kef will have to coordinate between CTDA and Le Kef Institute. Limited coordination with USAID/Tunis will also be required.

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Contractor's basic admin/logistical support will be provided by the COT. This Tunisian support will be supplemented by an AIB funded logistics/admin unit at the CTOA.

The long term advisor must have an B3,KS in French (as tested by FBI) not just an assurance that he is "fluent" in French.

Contract Technical Services

The contractor will be fully responsible for adequate staffing to meet contract objectives. The A.I.B. estimates for team composition are as follows:

<u>Long-Term:</u>	<u>Ki</u>
Resident Agronomy Advisor (Grain Research) (Contract Field Coordinator/Mgr.)	36 m
<u>Short-Term Consultants:</u>	
Crop Production Agronomist	10
Soil Fertility (Laboratory Specialist)	10
Farm Machinery/Experiment Station Mgt.	10
Farm Management Economist	6
Weed Control Specialist	4
Erosion/Conservation Specialist	4
Extension Training Specialist	6
Rural Sociologist	2
Ag Economist (small farmer risk analysis)	2
Water Management Specialist	12
Small Irrigation Systems Specialist	12
Horticultural Specialist(s)	8

Terms of Reference for Scope of Work - Resident Agronomy Advisor (Grain Production and Research)

General:

With assistance from project technicians and short-term contract consultants in rural sociology and small farmer risk analysis the advisor will make an analytical survey/review of factors affecting physical production in the project area such as land area, soil

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quality, crop varieties, rotation systems, levels of technology employed, levels of production, agronomic constraints, research information, etc. Following this analysis a research program will be developed which includes adaptive and applied research components which will be used to develop improved production "packages" for barley and wheat and other crops in the rotation plan. Research priorities will be recommended, project inputs determined and annual work plans prepared. Working with appropriate project technicians, advisor will determine/recommend: a) appropriate agronomic research targets/output goals; the technical personnel, commodities, and training required to meet these goals; b) appropriate agronomic research organization; c) training and functional literacy constraints and/or needs as related to research/production goals; d) adequate institutional mechanisms for research, extension, credit, improved seeds, etc; e) research linkages, in-country and international especially to ICDA, ICRIAR, CLAYT.

As recommendations are accepted, work with counterparts to initiate appropriate action for their realization.

Specifically the Agronomy Advisor will be responsible for the following work:

1. Manage/coordinate all field technical and business matters for the contractor (Dryland's Farming Systems and Small-Holder Irrigation Activities),
2. Coordinate the use of short-term technical consultants required for project implementation,
3. Assist in procuring project commodities included in the contractual agreement,
4. Prepare and submit to home office, GOF and AL/W within four months after arrival at post and at the 12th, 16th, 24th and 30th month a Semi-annual work Plan - copies to GOF to be in French.
5. The agronomist will assist in periodic evaluation of agronomic results and its effectiveness in achieving research production goals of the project. He will also address environmental concerns of the Agency (AL) as they relate to planned/proposed project research and agricultural production activities.

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6. Prior to the 25th month the contract adviser will be responsible for delivery of a draft "drylands extension handbook" outlining the key research findings of relevance to CE extension workers. This draft to be delivered in French to ODA, Le Kef and USAID. Prior to the 30th month the adviser will be responsible for delivering a final French language "drylands extension handbook" to those same offices. Flyers summarizing key elements of all specialized research on weed control, varieties, tillage, etc. will also be prepared in French for distribution to the relevant offices. This is to ensure that all major research outputs are made available in a useful form for the extension services of the ODA.

7. Submit a major draft technical and administrative report in French at the 30th month for USAID and ODA review. Submit 50 copies of a major final report to both USAID and ODA in French before the 30th month.

Minimum qualifications required:

- Ph.D. in Agronomy (Grain production and research - emphasis on barley)
- Ten or more years of professional experience
- Practical experience in semi-arid grain (barley and wheat) production and research
- Foreign experience as a technical adviser highly desirable
- French language competency levels - mandatory speaking - 3, reading - 3 (Foreign Service Institute testing system)

Cost:

Le Kef, Tunisia

(Project vehicle provided for official use only)

Evaluation Criteria

Weight

- | | |
|--|-----|
| i. International development competence and experience in agricultural program design, planning and project implementation | 15% |
| a. Francophone LDC experience | |
| b. Middle East experience | |
| c. Tunisia or North Africa experience | |

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Evaluation Criteria

Weight

2. Relevance of contractors' expertise and resources to development objectives of project 40%
- a. Resources - faculty, instructional and research programs, library materials involved or relating to semi-arid land agriculture, domestic and/or foreign.
 - b. Institutional experience, both administrative and technical, in establishing coordinated inter-institutional operational public program(s) in-involving agricultural research, extension and education.
 - c. Institutional experience with the International Dryland Research Network: IARD, ICRISAT, CILR, etc.
 - d. Experience with AID if not covered in Item one above.
3. Capability to provide support to a research program in agriculture in a "Less Developed Country" 40%
- a. Key staff members involved (amount of time)
 - b. Response to design and implementation requirements
 - c. Organization and staff to administer international development projects
 - d. Capability and experience in handling participant-trainees from LDCs
 - e. Capability and experience in managing training elements of development projects including in-country, US and third country training.

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<u>Evaluation Criteria</u>	<u>Weight</u>
4. Staff availability and qualifications (contract technical positions)	25%
a. Previous experience in francophone and Middle Eastern LDCs in the semi-arid cereals research and related technical field(s)	
b. Professional ability in French lang. (Team leader)	
c. Program planning, project implementation demonstrated capability to organize and lead team effort (applies to team leader)	
d. Program planning, project design/implementation experience writing skills (other team members)	
e. Managerial capability to implement project	
5. Research and production experience with semi-arid agriculture, particularly with grains (barley & wheat) and irrigated horticultural crops	20%
a. Types of research - applied, adaptive, basic	
b. Location, U.S. and/or foreign	
c. Range and breadth of institutional experience	
d. Understanding and utilization of national and international research linkages	

CENTRAL TUNISIA AREA DEVELOPMENT SUB-PROJECT PAPER

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AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET SUB-PROJECT 1		TRANSACTION CODE <input type="checkbox"/> A ADD <input checked="" type="checkbox"/> C CHANGE <input type="checkbox"/> D DELETE	PP 2 DOCUMENT CODE 3						
3 COUNTRY ENTITY TUNISIA/USAID		4 DOCUMENT REVISION NUMBER							
5 PROJECT NUMBER (7 digits) 664-0312.1	6 BUREAU OFFICE A SYMBOL NE B CODE 03	7 PROJECT TITLE (Maximum 40 characters) Central Tunisia Area Development							
8 ESTIMATED FY OF PROJECT COMPLETION 814		9 ESTIMATED DATE OF OBLIGATION A INITIAL FY 79 B QUARTER 2 C FINAL FY 81 (Enter 1, 2, 3, or 4)							
10 ESTIMATED COSTS \$000 OR EQUIVALENT \$1									
LIFE OF PROJECT									
A FUNDING SOURCE	FIRST FY			LIFE OF PROJECT					
	B F Y	C F Y	D TOTAL	E F Y	F F Y	G TOTAL			
AID APPROPRIATED TOTAL	982	500	1482	1700	2800	4500			
GRANT	982	500	1482	1700	2800	4500			
LOAN									
OTHER US Counterpart		250	250		250	250			
HOST COUNTRY		150	150		1500	1500			
OTHER DONORS									
TOTALS	982	900	1882	1700	4550	6250			
11 PROPOSED BUDGET APPROPRIATED FUNDS \$000									
A APPROPRIATION	B PRIMARY PURPOSE CODE	PRIMARY TECH CODE		FIRST FY 79		SECOND FY 80		THIRD FY 81	
		C GRANT	D LOAN	E GRANT	F LOAN	G GRANT	H LOAN	I GRANT	J LOAN
1) FN	20C	210		1482		1385		1633	
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TOTALS				6482		1385		1633	
12 IN DEPTH EVALUATION SCHEDULED									
A APPROPRIATION	FIRST FY		LIFE OF PROJECT						
	C GRANT	D LOAN	E GRANT	F LOAN					
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TOTALS			4500						

13. DATA CHANGE INDICATOR (WERE CHANGES MADE IN THE PRO FACESHEET DATA BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA BLOCK 2)? YES ATTACH CHANGED PRO FACESHEET

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14 ORIGINAL NO OFFICE CLEARANCE		15 DATE DOCUMENT RECEIVED IN AID # OR FOR AID/W DOCUMENTS. DATE OF DISTRIBUTION	
SIGNATURE		DATE SIGNED	
TITLE <i>Hermon G. Marshall</i> Director, USAID/Tunis (Acting)		MM CC YY 11 17 78	

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II. SUB-PROJECT DESCRIPTION

A. General

The Area Development sub-project will operate within the eight delegations described in the Project Paper.

It is designed to support three activities:

1. In-country training for regional planning and evaluation.
2. Technical consultation in planning, designing, and managing specific U.S., Government of Tunisia (GOT) or other donor-financed investments in the region.
3. Grant U.S.-financing of an "experimental fund" designed to assume the direct costs of fully experimental test projects in all aspects of area and rural development.

These activities will be executed through the venue of the Central Tunisia Development Authority (CTDA). Their purpose will be directed at:

-- Increasing the efficiency, effectiveness, and access to basic infrastructure and public services within the region.

Current GOT technologies, delivery systems, standards, management, and conceptual approaches to problem-solving appear to be often ill-suited to the needs of a disadvantaged region with a highly dispersed population. This observation applies to infrastructure, technical services, and social services as well. It is essential to develop lower cost technologies and new forms of services delivery if the gap between the Central Tunisian region and other parts of the country is to be reduced and the quality of life brought closer to the national average.

-- Improving utilization and management of the natural resource base of the region.

Existing land and water resources are inefficiently used, even with the capabilities of existing crop varieties. Improved extension leading to improved farm practices could, therefore, have a favorable impact upon production. An even greater impact could be derived from careful planning of land and water use. Such planning could then be implemented by CTDA through programs of erosion control, irrigation, attention to processing and marketing, new varieties and better cropping patterns, more profitable employment of family labor, and improved defenses against crop failure and associated decapitalization.

-- Stimulating private investment and off-farm employment in the Central Tunisia region.

Migration for work in the cities, in Libya or in Europe, is a common component of family survival strategies in the region. Current labor patterns leave the region with heavy under-employment combined with real labor shortages for certain agricultural operations. Small local agro-industries or even light manufacturing may represent alternatives to migration and a stimulus to adoption of improved agricultural practices in the region.

-- Installing within the CTDA the institutional and technical capacities to effectively promote planning, management, and evaluation as a part of all GOT-sponsored developmental activities within the region.

Only an Authority vested with the responsibility for analyzing the peculiar problems of the region and doing something about them can check the trends toward growing inter-regional disparity. It must be free to experiment and accept the entrepreneurial task of reorganizing public resources to implement proposed solutions. Development of a strong CTDA planning and evaluation capacity, therefore, comprises a major part of the institutional capacity which must be established if effective regional development is to occur.

B. Technical Interventions

Each of the activity components will come into place after the CTDA is established. They include, in detail:

1. Training -- Evaluation and Planning

An Evaluation and Planning Unit (EPU) will be created within the CTDA. It will be staffed by Tunisians, charged to plan development for the region, and evaluate the impact of public efforts at development.

A.I.D.'s most important input, therefore, will be the provision of on-the-job training at the EPU for staff members. This will take place for three years.

All training will be in the French language. It will be given in Kasserine, with the exception of short "study tours". Training will be formal (i.e. regular testing will be given and a "certificate" awarded upon successful completion of the course). It will take place in a praxis mode. That is, all training exercises will

* The course will lead to the University of Wisconsin Diploma in Regional Planning.

utilize the actual planning tasks assigned to the EPU.

As will be noted from the Outputs Table, at least 10 CTDA staff will receive 12 months of the certificate course in regional planning; and an additional 25 CTDA staff members will obtain 3 months of training.

Training on regional planning techniques and in the methods of project design will be provided by the University of Wisconsin under a Cooperative Agreement in Area Development with the Development Support Bureau, Office of Rural Development and Development Administration, AID/Washington.

Similarly, at least three (3) of the CTDA staff will receive training in evaluation and data management techniques. Training will be for six (6) months. Additionally, 10 CTDA staff and possibly selected governorate officials responsible for rural development will receive six (6) weeks of formal training in these techniques.

Training in the gathering of data management of information systems and in the techniques of analysis and evaluation will be provided by Cornell University under a Cooperative Agreement in participation with the Development Support Bureau, Office of Rural Development and Development Administration, AID/Washington.

E. Technical Consulting

The project will assign two long-term (3 years each) American advisors to the CTDA in Kasserine. One will be a specialist on regional planning, the other will be an agricultural planner (see Annex B for position descriptions). The bulk of the technical assistance will be short-term and coordinated by the University of Wisconsin Senior Resident Advisor (Regional Planner) and logistically supported by a contractor-managed local administrative support staff.

They will provide technical assistance, specifically, to the EPU concerning the development of specific investment projects for the region. They will emphasize approaches which rationalize the currently ad hoc character of government efforts in the region; but with due attention to the principles reflected in the current Programme de Developpement Rural (PDR) of the GOT. They will encourage projects that utilize technologies, modes of organization, and types of services suitable to the natural and social environment of the region and financially feasible within its resource endowments.

The two resident advisors will help to coordinate the above activities and other USAID interventions in the region. They will be responsible for bringing the EPU, within three years, to a position where it can design its projects and plans and draft a regional plan for the Ministry of Plan. They will assist the EPU to develop a number of interim "investment strategies" for the region in order to lay the groundwork for such a plan. Timing on this particular effort is particularly important because the initial planning for the next GOT Five-Year Plan will start in 1981.

Projects planned and designed by the EPU during the three-year period may include those activities funded from that portion of the GOT Rural Development Fund allocated to the CTDA, activities funded by USAID and other donors, and projects to be funded from regular investment budget funds under the next Five-Year Plan.

3. The "Experimental Fund"

This Fund will be co-managed by the CTDA and the contractor (University of Wisconsin) with detailed administration assigned to the EPU of CTDA. The Fund (obligated in three tranches) will be used to assume the direct costs of fully experimental pilot projects. Such projects will be aimed at testing (a) new technologies (e.g. lower cost possible water delivery systems); (b) more efficient means of organizing social services (e.g. use of para-professionals); and (c) ways of exploiting complementarities among existing programs (e.g. coordination of programs for expansion of irrigation facilities, extension of new cropping patterns, and loans for small agro-industries).

The purpose of these various experiments will be to explore with other GOT agencies replicable models of interventions suited to the region. This "experimental fund" will be dollar-funded with matching Tunisian Dinar (TD) counterpart funds.

4. Commodities and Supplies

This will include appropriate calculating equipment with a data storage and manipulation capacity suitable to the needs of the EPU, and a limited amount of office equipment essential to support the research, training, and planning efforts, and two new vehicles (U.S. manufacture diesel V.W.s) for logistical support of the EPU.

5. Support Services

This will include Tunisian support and logistics capacities at Kasserine and Tunis designed to demonstrate to the CTDA how technical services and training should best be backstopped. (See Project Paper sections on CTDA).

C. INPUTS AND EXPECTED OUTPUTS:

TABLE 1

SUMMARY OF PROJECT INPUTS

<u>INPUT</u>	<u>UNDER AREA PLANNING CONTRACT</u>	<u>UNDER EVALUATION SYSTEMS CONTRACT</u>	<u>TOTAL</u>
<u>Training staff on-site</u>			
Regional Planning	24 PM		24 PM
Evaluation & data mgmt.		17 PM	17 PM
<u>TOTAL US STAFF INPUT FOR ON SITE TRAINING</u>			<u>47 PM</u>
<u>Technical Consultants</u>			
Regional Planning			
Short-term	32 PM		32 PM
Long-term:			
a. Regional Planner	36 PM		
b. Agric. Planner	36 PM		72 PM
Evaluation & Data Mgmt.		6 PM	6 PM
<u>TOTAL LONG & SHORT-TERM CONSULTANTS</u>			<u>110 PM</u>
<u>SUPPORT SERVICES (Local Hire) FOR LOGISTICS AND ADMINISTRATION</u>			
Senior Adm. Officer (Kasserine)	48 PM		
Junior Adm. Officer (Tunis)	36 PM		
Prog. Adm. Secretary (Kasserine)	48 PM		
<u>TOTAL LOCAL CONTRACT ADMINISTRATIVE/LOGISTICAL STAFF</u>			<u>132 PM</u>
<u>AREA DEVELOPMENT EXPERIMENTAL FUND</u>			
Grant to CTRD, managed by Area Development Contractor			\$2.8 million
<u>TOTAL GRANT FUNDS FOR EXPERIMENTAL PROJECTS</u>			<u>\$2.8 million</u>
<u>EQUIPMENT & SERVICES</u>			
Scientific & Office Supplies (contractor procured)	\$100,000		\$100,000
Minicomputer (contractor procured)		\$50,000	50,000
Large frame computer time	\$ 50,000	5,000	55,000
Preparation of trng. materials	\$ 60,000	15,000	75,000
Vehicles for U.S. Project Staff (2 U.S. made VW diesel sedans) AID procured			20,000
<u>TOTAL DOLLAR COST OF EQUIPMENT & SERVICES</u>			<u>\$300,000</u>

NOTE: this admin. staff will support the entire CTRD, not just the Area Development, but will be funded through Area Planning Contract & managed by that contractor.

TABLE 2

SUMMARY OF PROJECT OUTPUTS

<p><u>TRAINING:</u> At least 10 CTDA staff, including all of the five professionals, will have received the full 12-month certificate course in <u>regional planning</u>. An additional 25 staff of the CTDA will have received at least 3 months of regional planning training related to their technical specialties. All training in French.</p>	<p>195 PMs of formal on-site training in regional planning</p>
<p>At least 5 of the CTDA staff will have completed 6 months of <u>on-site formal training in evaluation and data management techniques</u>. At least 10 additional CTDA staff will have completed at least 6 weeks of formal training in evaluation and basic project data management related to their technical areas. All training in French.</p>	<p>78 PMs of formal on-site training in evaluation and data management</p>
<p><u>DATA MANAGEMENT SYSTEM:</u></p> <p>A management system will be set up in the CTDA with fully operative files for planning and evaluation with all members of the EPU trained to operate the system.</p>	<p>One Regional Data Management System fully operational</p>
<p><u>REGIONAL PLAN & SUPPORTING DOCUMENTS:</u></p> <p>The EPU, with technical support from the 2 long-term technicians, will produce a series of iterations of regional investment schedules with increasing specificity and with inter-sectoral linkages. This will lead to a final draft regional plan for input in the next GOT Five-Year Plan.</p>	<p>One draft regional plan</p>
<p><u>EXPERIMENTAL PROJECTS:</u></p> <p>Over four years, the EPU at CTDA will conduct a series of experimental sub-projects which in most cases, will produce or define specific technologies for the Central Tunisia region, specific models of program organization, or regionally specific design and costing parameters. At least 15 such projects in such areas as potable water, transport, off-farm employment, preventive health services, etc., will be completed by the end of project.</p>	<p>15 completed experiments</p>
<p><u>EVALUATION STANDARDS FOR EXT AGENCIES IN THE REGION:</u></p> <p>Over the life of project, we can forecast a measurable improvement in the precision of indicators used for performance evaluation and in the types of evaluation analysis applied as well as a proven reduction in the error terms in multi-variate analysis. A functioning CTDA evaluation system.</p>	<p>One CTDA evaluation system</p>

III. SUB-PROJECT SPECIFIC ANALYSES

A. Economic Feasibility

The returns to planning investment in Central Tunisia will be less in the form of cash return on project cost than in terms of increased efficiencies and lowered unit or per capita costs of future investment in the region. If properly developed, this can provide numerous opportunities for adoption of alternative strategies.

An example of the kinds of control which this sub-project can provide on future costs is indicated in Table 3 below which relates SONEDE potable water systems costs to the demographic variable in Central Tunisia, and the best comparison table which permits evaluation of existing alternative technologies. These data suggest that the GOT and A.I.D. have probably already overinvested in some potable water systems in the area. They suggest, too, that the careful application of rational regional planning to the development of a regional water investment policy could yield considerable cost savings.

TABLE 3

VILLAGE POPULATION vs, COSTS PER CAPITA OF SONEDE SYSTEMS

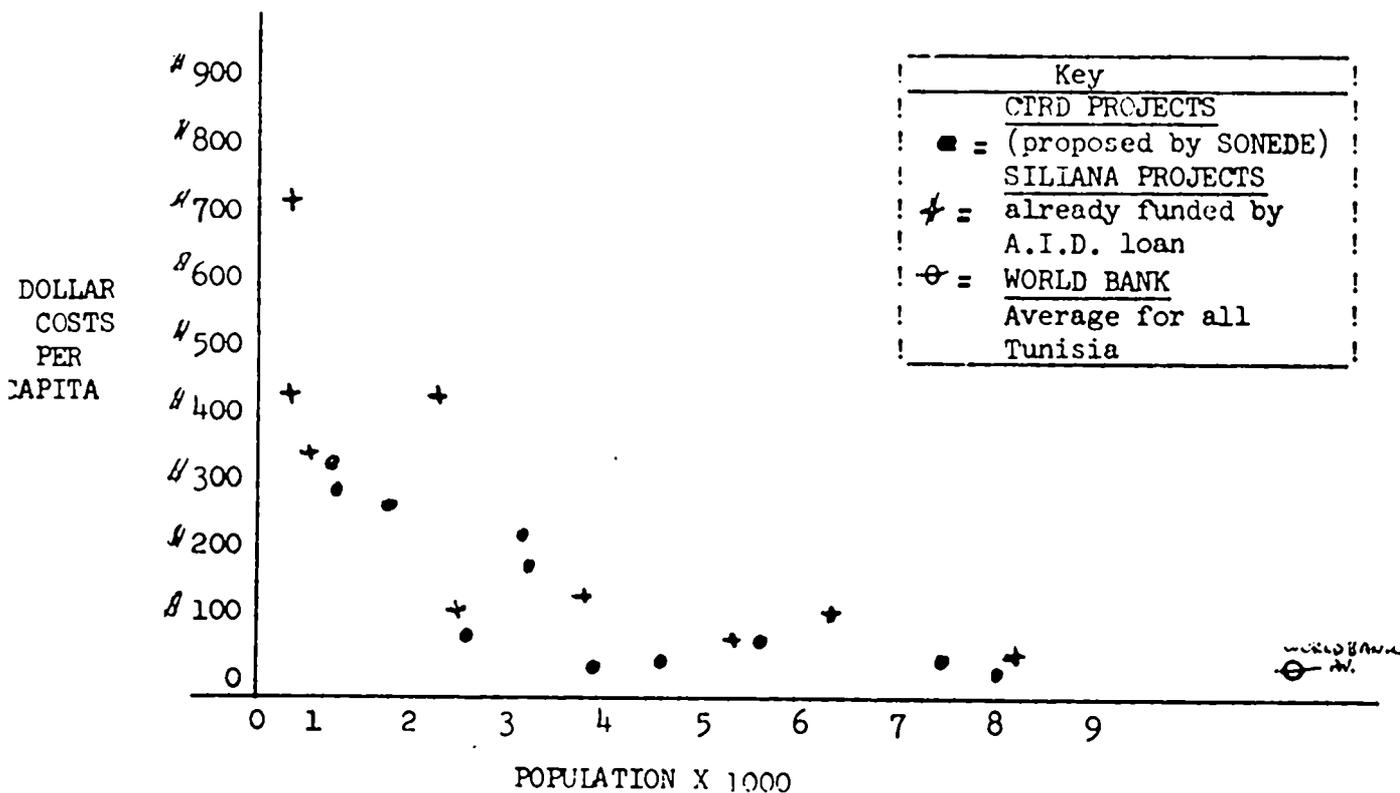


TABLE 4

ALTERNATIVES TO THE SONEDE MODEL FOR SMALL POPULATION CENTERS
(actual and derived costs)

SONEDE values: 350 pop. served at \$4.00/capita for 30 liters/capita/day

Initial Cost (TD)	Pop. Served	Liter/capita/day	Cost/Capita (\$)	Cost/m ³ (TD)	20 Year Cost/m ³ (TD)
Spring TD1,144.294	350	16	\$0.25	0.575	0.050
Dug & Augered Well (new) 2,077.487	350	16	14.75	1.016	0.086
Dug Well (2 new pumps) 1,573.487	350	16	11.50	0.794	0.090
Drilled Well w/hand pump (new) 1,800.000	350	16	13.00	0.900	0.077
Dug Well w/motor pump 6,832.000	500	20	34.00	1.872	0.332
Surfacewater Catchment 5,275.000	20	16	-	-	-
Drilled Well w/rotor (new) 7,907.200	500	20	51.75	2.286	0.335
Dug Well w/motor 6,348.000	500	20	40.75	2.233	0.347

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This sub-project is aimed at creating an institutional capacity (for about \$4 million) for planning, implementation, and evaluation. It is hoped that this will assure the more efficient use of public resources in the region. Within twelve months, the sub-project should be able to devise optimal solutions to the potable water supply problem illustrated above. Within two years, it is expected to have improved investment criteria for siting and design standards. Within three years, the EPU should be in a position to assist in seeking least-cost solutions to virtually any of the public investment situations which the CTDA is likely to confront.

Under these circumstances, the medium-and long-term cost-effectiveness of this undertaking should be excellent. Its overall design favors lowered costs and high returns because:

1. All the technology transfer takes place on site at Kasserine. The time and money costs of moving staff from the job-site to distant or overseas training is completely eliminated.

2. There is focus on producing analytical and operational capacity among staff and physical infrastructure which already exists.

3. In accordance with the selected investment formula selected at the outset of the design, the Area Development activity emphasizes the redistribution of increments of growth to the lower income elements of the region's population. It will build equity biases into the CTDA planning formats. 1/

4. The first 18 months of sub-project operation will concentrate on rationalizing complementary activities among existing investment alternatives (vair. potable water) rather than on high-risk departures from known technologies and models. As the planning capacities of the EPU increase, the ability to control risk also increases and the scope of experimentation can be widened.

An implied EIR cannot be attached to an investment in area development planning. Total GOT and A.I.D. financing are now projected at an initial level of about \$60 million a year. The GOT investment is projected to rise as the years go by. We can at least anticipate that the \$4 million cost of the EPU will be amortized within the life of this sub-project through induced cost savings and efficiencies of total program investment.

B. Social Soundness Analysis

(See relevant section in Project Paper)

1/ See Annex C for equity-biased investment formula.

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C. Technical Feasibility

Since this is basically an institution-building activity, the technical feasibility aspect cannot be separated from development administration-type issues.

1. CTDA capacity to receive an intensive regional planning input

Planning, in the European sense, is important to the Government of Tunisia. It requires maintenance of resource inventories (water resource inventories are a prime example in Tunisia) and supports the formal process of fitting investment projects into a carefully defined macro-plan. Hence, the Area Development sub-project enters an environment where some forms of planning are established and legitimate.

The budgetary and managerial environment of the GOT is also reasonably receptive to the use of planning tools. Particularly those which make complex development objectives tractable to the budget process: cost-per-beneficiary measures, capital vs. O&M cost comparisons of investment alternatives, IRR calculations on economic projects, etc. Providing the CTDA with capacity to handle tools of this sort will help to legitimize its place in the GOT system and influence investment decisions.

The GOT is increasingly interested in regional planning. It has noted at least two deficiencies in the present Tunisian planning process:

- a. A lack of planning flexibility to shift from national to regional perspectives.
- b. A tendency to focus on the logical ordering of known techniques and models rather than to identify and solve alternative cost/design/technology equations.

Ultimate determination of the capacity of CTDA to work on regional planning will be settled, in part, by the kinds of leadership and staff assigned. But the opportunity for effective development of such a capacity seems very favorable.

2. Availability of technically competent personnel

There are a number of junior and middle-level civil servants who have had formal training and experience in economics and statistics and in the use of the quantitative tools required for regional planning. Many would welcome the opportunity for training (cum diploma) by the University of Wisconsin.

3. Availability of contract skills to deliver the technical assistance

A.I.D. has investigated the availability of skills required for this project. Each of the two prospective contractors -- University of Wisconsin and University of Cornell -- possess special technical skills and interests which fit them uniquely for performance of various aspects of this project. The University of Wisconsin has just won a competition for A.I.D. contracting on regional planning. It competed against the best planning institutions associated with American academia. Similarly, the University of Cornell has developed an information and analysis system that is unique. Both of these institutions assert that they are in a position to deliver the necessary Francophone technical services as specified in the PP and Annexes.

4. The minicomputer based information system

A careful technical feasibility study favors the establishment of field minicomputer capability for several reasons:

a. The wage levels for statistical clerks set the cost of manual data management at prohibitive levels.

b. Field level data coding and processing, while feasible, is not desirable because the program is at one removed and rendered somewhat mysterious to EFD staff. Furthermore, data manipulation by the users in the field is more efficient and improves the confidence of the data users.

c. U.S. minicomputers are already in use in Tunisia. The Agricultural Studies Center (CNEA) uses the HP 45 which is recommended in the feasibility study.

d. The capacity of a minicomputer (less than 100K) is more than adequate for the kinds of data storage, manipulation, and analysis required for the EFD.

e. The system cost (about \$50,000 with ancillary equipment) and program software is reasonable in terms of the sub-project magnitude.

f. CTDA staff trained on the minicomputer can move into other GDF planning jobs which use similar equipment. This can serve as an additional inducement for technically ambitious young staff to join the CTDA.

5. Institutionalization of the CTDA planning functions

This will require that, early on, the EPU gain acceptance and influence within the organization by demonstrating its problem-solving capacity. With the University of Wisconsin technical assistance available from inception, the CTDA's EPU will have a capability for program evaluation and analysis (of the type exemplified by Section III.D. of the Project Paper) which will permit it to shape program strategies for different sectors (agriculture, potable water, transport, etc.) rather than simply react to project proposals made by technical divisions. This will encourage the CTDA Director to rely increasingly on the EPU for analytical inputs to major policy and program decisions and the technical divisions to rely on the EPU for assistance in project design.

D. Administrative Feasibility

This Area Development activity has been designed for GOT/contractor implementation with minimum operational support from USAID. The prime contractual relationship will be between DSB/RAD (see Project Paper) and two U.S. universities with whom it holds cooperative agreements.

1. Responsibilities

The University of Wisconsin, operating under the AID/W Cooperative Agreement and a separate Memorandum of Understanding with the CTDA, will have primary responsibility for overall implementation of this sub-project. It will be specifically responsible for the planning, analysis and project design components of the sub-project. Cornell University, operating under a separate Cooperative Agreement with A.I.D., will be responsible for the data gathering, information systems management and program evaluation components of the sub-project. The University of Wisconsin senior resident advisor (regional planner), however, will be responsible for overall coordination of advisory and training inputs from both Cooperative Agreements (see Implementation Section of the Project Paper for further details on contracting arrangements).

Specific responsibility for management of the "Experimental Fund" will be shared between the CTDA and the University of Wisconsin. Broad criteria for the utilization of this Fund (and of the Rural Development Program (PDR) funds made available by the GOT) will be developed jointly by the University of Wisconsin senior resident advisor and the Chief of the EPU, approved by the CTDA and USAID and incorporated into a sub-project Implementation Letter. All

pilot projects proposed for financing would have to meet these criteria and, in the case of the A.I.D.-funded "Experimental Fund", a certification to that effect by the senior resident advisor would be required prior to disbursement from the Fund. No prior approval from USAID, however, would be required, on a project-by-project basis.

Experimental interventions which meet PDR criteria would be financed jointly by A.I.D. and GOT (PDR) funds. Those which do not meet PDR criteria (for instance, those which do not qualify as "investment projects") would have to be financed entirely from the A.I.D.-funded "Experimental Fund" (and, possibly, funds contributed by other agencies).

The performance of the "Experimental Fund" would be reviewed jointly by USAID, AID/W evaluation staff, the CTDA and the two contractors as part of the intensive mid-term evaluation scheduled for October 1980. It would be a condition precedent to disbursement from the FY 1980 tranche of the "Experimental Fund" that a determination be made in writing by A.I.D. either (a) that pilot project funded from the FY 1979 tranche of the "Experimental Fund" by and large have met the criteria previously agreed upon, or (b), if these criteria have not been met, that steps have been taken to insure they will be met in the future.

2. Logistical Support

The University of Wisconsin will operate a locally-staffed contract administrative and logistical support unit consisting of two Tunisian sub-professionals and one clerical. The structure and financing of this unit is detailed in the Project Paper.

3. Environmental Analysis

(See Section in Project Paper)

IV. FINANCIAL PLAN

The financial plan for the duration of the sub-project is shown below in Table 5. While inputs will be phased in over a five-year period, the sub-project will be incrementally funded over a three-year period. ^{1/}

The funds budgeted for the Area Development Cooperative Agreement include \$1,260,000 for advisory and training services and \$150,000 for administrative support of all U.S. contract services under the Area Development, Dryland Farming Systems and Small Holder Irrigation sub-projects.

1/ Incremental funding is in line with funding guidance to USAID. Mission would prefer life-of-project funding.

Disbursements under the two Cooperative Agreements will be made by AID/W on the basis of a schedule to be established by DSB/RAD. This schedule will provide for dollar advances both for advisory services and administrative support. Dollar funds advanced under the Area Development Cooperative Agreement for administrative support will be converted into Tunisian Dinars by the contractor at the American Embassy accommodation exchange facility.

While all equipment directly related to planning and information systems is funded under the two Cooperative Agreements, two administrative vehicles and a modest amount of general office equipment are funded as a separate line item and will be procured under PIC/Cs.

Only local currency expenditures will be financed from the Area Development Experimental Fund. An initial advance will be made to the CTDA on the basis of an estimated requirement for the first six months, to be developed jointly by the senior resident advisor and CTDA staff. Subsequent disbursements will be made on an actual cost reimbursement basis.

TABLE 5

FINANCIAL PLAN
(thousands of dollars)

	<u>FY 1979</u>	<u>FY 1980</u>	<u>FY 1981</u>	<u>TOTAL</u>
Area Development Coop Agreement (Planning)	802	310	298	1,410
Local Participation Coop Agreement (Evaluation)	130	75	35	240
Commodities	50	-	-	50
Experimental Fund	500	1,000	1,300	2,800
	<u>1,482</u>	<u>1,385</u>	<u>1,633</u>	<u>4,500</u>

V. IMPLEMENTATION SCHEDULE

(See Project Paper)

VI. EVALUATION PLAN

(See Project Paper)

VII. CONDITIONS, COVENANTS, NEGOTIATING STATUS

(See also the Conditions and Covenants Section of the Project Paper)

Conditions Precedent

A. Before any disbursement can be made for technical services under this sub-project, adequate staff must be assigned to the CTDA Evaluation and Planning Unit, including the head of the Unit, at least five professionally qualified planners and sufficient sub-professional technical and clerical personnel. These staff must be physically working full-time at the CTDA in Kasserine.

B. Prior to any disbursement under the "Experimental Fund" portion of this sub-project, the GOT and USAID must approve, in writing, a set of criteria for use of the "Experimental Fund," to be developed by the CTDA Evaluation and Planning Unit and the senior resident area development planning advisor.

C. Before any disbursements can be made for formal on-site training, the Director of the CTDA shall furnish an assurance, in writing, to USAID that staff enrolled in this training will be permitted sufficient released time to permit them to fulfill all the training requirements.

Area Development Log, Frame

PURPOSE	GOALS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
Establish CTDA evaluation and planning capacity to manage the natural and other resources of the region with emphasis upon increased income, employment, efficiency, and access to rural infrastructure and services	<p>1. Evaluation and planning unit staff fully operational and trained on site and in <u>praxis</u> mode.</p> <p>4. CTDA evaluation and planning unit with capacity to gather, manipulate, and analyze planning data.</p>	<p>1.a. actual planning, analytical, and project development tasks of Unit used as training materials; and laboratory starting in July, 1975 and continuing through project.</p> <p>1.b. training biased, from outset, towards: coordination of professional staff time, avoidance of development of inappropriate highly specialized skills, and meeting immediate programming needs.</p> <p>2. By FY 81 or planning data required by CTDA management prior to all major policy decisions, and evaluation and planning unit able to provide reliable analysis.</p>	<p>1. Curricula of on-site training programs</p> <p>2. CTDA records</p> <p>1. On-site training is feasible and can be organized so as to both emphasize training and production of results.</p> <p>2. CTDA policy-makers and operational staff will recognize value of planning and evaluation in daily operations of CTDA.</p> <p>3. CTDA can rapidly recruit basically qualified and easily trainable staff for the Evaluation and Planning Unit.</p>

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<u>PURPOSE</u>	<u>GOALS & MEASURES</u>		<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
	3. Unit's competence established in project design, development and evaluation activities	3. By FY 81: a. Unit participating in design of at least 3 AID-assisted projects. b. Unit completed evaluations of at least 3 AID-assisted interventions. c. Unit design and evaluation products being utilized by CIDA policymakers.	3. Projects designed and evaluated.	4. CIDA evaluation and planning can tangibly assist that agency in coordinating COT inputs to the region.
	4. Unit operating a zonal data collection and analysis system linked to the planning process, project development, and evaluation.	4. By FY 80: a. Types of data assembled by categories of: - population socio-economic characteristics - environmental and agricultural systems characteristics - characteristics of infrastructural improvement and services provided. b. Initial base line data collection completed by July 1979 and redone annually at least for four years.	4. Mini-computer operational, data management package installed, and organized: data flowing to planners and evaluators.	5. COT policy will continue to encourage regional planning and decentralization. 6. COT policy planners will gradually recognize the importance of developing downsized packages of technologies for disadvantaged interior regions. 7. CIDA can engage effectively on a consultative research organizations and individuals in specific research topics. 8. CIDA can operate evaluation so that it is perceived as an assistance and not a threat to sub-project operations.

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<u>PURPOSE</u>	<u>WORK & MEASURES</u>	<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
<p>5. Unit testing new low-cost technology interventions in order to promote greater rationality in public investments.</p>	<p>c. micro-data collected on basis of specific sub-project and experimental interventions. d. Measures of regional progress and disparity-reduction relative to Tunisia as a whole: developed using secondary sources. e. Data files established, by units of analysis, dates of measurement, and year. f. Combinations of data sources and data collection methods in use by Unit staff on direct performance and sub-contract basis. g. Mini-computer and data management package operational by Unit.</p> <p>5.a. Attainment of growing conformity to new investment priorities (as result of improved planning, analysis, and evaluation) in use of Rural Development Funds (Ministry of Planning) by end of 1980.</p> <p>5.b. Series of 15 experimental projects aimed at producing specific technologies adjusted to the region designed and tested by the Unit by end of 1981.</p>	<p>5. CfdD investment priorities stated, and experimental projects designed.</p>	<p>9. National sources of secondary data can be assisted by CTD in ways calculated to produce useful disaggregated data.</p> <p>10. Number of training and production operations scheduled for CTD evaluation and planning Unit can be adjusted in mid-term in sub-project in order to adjust to practical realities of staffing, needs, timing, etc.</p> <p>11. That there do, indeed, exist lower cost models that can improve public services in the region.</p>

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<u>PURPOSE</u>	<u>GOALS & MEASURES</u>	<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
:	:	7. By end of 1980: a. (cont'd) -maintenance of water table level b. Unit affecting and improving: services, local skills-training, employment generation, and enterprise diversification in region.	:

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<u>OUTPUTS</u>	<u>MEASURES & ASSURANCES</u>	<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
1. Unit-employed trained staff operational	1. By end-of-project: a. 10 diploma-level regional planners trained on-the-job. b. 25 CDA staff trained on-the-job for 3 months each in various aspects of regional planning. c. 3 CDA staff trained on-the-job for 6 months each in evaluation and data-management techniques. d. 10 CDA staff trained on-the-job for 6 weeks each in evaluation and data management techniques.	1. Diplomas and certificates issued by the University of Wisconsin	1. Correct and timely "mix" of training and production oriented skilled staff can be provided by the Universities of Wisconsin and Cornell and properly utilized by CDA.
2. Unit analysis skills improved cost-beneficiary and other forms of measures appropriate to cost-effective solutions to regional problems.	2. By end-of-project: a. Effective utilization of probability, multivariate analysis, and other quantitative analytical tools in study and adoption of at least 4 new technological applications in the region. b. Effective utilization of analytical tools related to improved use of budget process and costing in at least 4 project designs for the region.	2. Designs and evaluations produced using various analytical quantitative and budgetary process tools.	2. Projected levels of regional planning and evaluation and data-management training are sufficient to meet CDA needs. 3. There is a causal connection between improved CDA planning and evaluation and CDA capacity to design and manage projects which effectively lower costs of technologies and increase productivity and income in the CDA region.

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<u>OUTPUTS</u>	<u>INDICATORS & MEASURES</u>	<u>MODES OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
3. Skilled analysis of relationship, inter-dependencies, and flow between elements that comprise projects, programs and budgets.	3. By end-of-project: a. Project selection analysis capacity tested among 25% of Unit staff. b. Project input requirement analysis capacity tested among 25% of Unit staff. c. Project scheduling and network analysis capacity tested among 25% of the Unit staff. d. Appraisal, monitoring, review, and in-depth evaluation capacity tested among 25% of the Unit staff.	3. Products of systems analysis, network analysis, and appropriate KZDS analysis available in Unit files.	14. There are educated, young, Tunisians who are interested in learning the principles and applications of regional planning and evaluation in a regional field context. 15. Adapted quantitative analysis and various other analytical tools can be quickly placed in use by the CDM evaluation and planning unit.
4. Unit applying multiple regression and correlation analysis to zonal and micro-specific researched or collected time-series data for immediate use in planning and evaluation.	4. By end of FY 00: a. Identification of causal linkages between project interventions and external factors in at least two project evaluations. b. Continuing specification of meaningful and least costly (to gather) indicators. c. Continuing test and use of varied data collection methods.	4. CDM information system products and specific sets of analyses.	16. It is possible to quickly identify, modify, and test various kinds of low-cost technology applications and/or policies through the CDM instrumentality. 17. It is possible for CDM to affect the substantive project content of activities funded by the World Development Fund (Ministry of Planning). 18. It is possible for CDM through budgetary allocations and other means to affect the timing of technologies and investment priorities of other CDF agencies operational in the CDF region.

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OUTPUTS	COSTS & MANURES	MEANS OF VERIFICATION	ASSUMPTIONS
5. Systems developed for identifying, assessing feasibility, and testing low-cost infrastructural, production, and services technologies for CDRK area.	5. by end of FY 79: a. CDA and Unit procedures established for identifying one new low-cost technology for test in CDRK area. b. Variations on an existing CDF- used technology tested in at least one case in CDRK area. c. Work program for more intensive identification and test of low-cost technologies charted for FY 80 and FY 81. d. R/F budget of Ministry of Planning affected by Unit's initial testing of new priority investment criteria.	5. Technologies developed or modified, test results recorded, policies adopted, and work program for FY 80 and 81 charted.	9. Substantive input of studies, data, and analysis in matters concerning regional planning can be achieved by the Unit by the end of FY 80. 10. The Unit can organize and effectively operate various means of commissioning and inter-relating specific kinds of on-going, intermittent, and single studies. 11. Research and evaluation results will quickly be fed back into the alteration of CDA policies, project designs, and operations.
5. Development of regional inventory of resources with accompanying opportunity costs analysis and ranked investment priorities.	6. by end of FY 80: a. Resource inventory completed in 4 Delegations. b. Opportunity cost analysis completed in 3 Delegations c. Investment priorities ranked in 4 Delegations.	6. Resource inventory, opportunity cost analysis, and ranked investment priorities completed.	12. Director of CTDA places continuing high priority on training and experimental functions of unit.

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<u>OUTPUTS</u>	<u>USES & MEASURES</u>	<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
7. CCF agencies technological designs and funding policies affected by Unit studies and CDA funding.	7. At least one major change in a CCF agency design standards and costing (probably some) of inputs by end of FY 78.	7. CDA records.	
8. Unit skills, contracting, and mobility resulting in studies of natural resource and other resource planning and management needs of CDA area.	8. by end of FY 1980: a. Systems for defining and commissioning physical, social, and economic research established by end of beginning to operate. b. Specific studies related to agricultural cropping, marketing, and credit in 3 delegations of area completed. c. Specific studies related to rural-based skills-training, rural industrial development, and off-farm employment completed for CDA area.	8. Studies completed.	

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INPUTS	ECS & MEASURES		COST (in U.S. \$)	METHODS OF VERIFICATION	ASSUMPTIONS
	Person-months				
U.S.	:	:	:	:	:
Technical assistance:	:	:	:	:	:
a. Full-time resident advisors: (2 x 36m)	72	:	:	1. Annual reports of cooperation, Universities to US/ISS	1. University-supplied personnel can be gotten into position quickly at Kasserine.
b. Short-term consultants	38	:	:	:	:
c. Short-term staff for on-site training program	41	:	:	2. USAL/Tunis reporting procedures.	2. Satisfactory mechanisms can be worked out for joint US and advisory group planning and scheduling of work tasks on an annual basis.
d. Local admin/logistical support (Tunisian staff)	108	:	:	3. Periodic OOT/USAL review of performance.	3. Equipment and supplies can be procured and shipped on a timely basis.
e. Evaluation (4th Year)	4	:	:	:	:
f. Analytical work by consultants in U.S.	10	:	Total TA 1,400,000	:	4. Easily operated criteria and procedures for handling the "experimental fund" can be worked out between USAL and the OOT.
Equipment and Supplies	:	:	:	:	5. USAL/Tunis is adequately staffed and internally organized during, at least first 18-20 months of sub-project to permit proper supervision and monitoring of efforts.
a. Data-processing equipment	:	:	:	:	6. Both the OOT and the US governments display determination to continue assisting this sub-project effort over some time.
b. Scientific equipment, ref. materials, and supplies	:	:	:	:	
c. Training materials	:	:	Total equip. 300,000	:	
Capital:	:	:	:	:	
"Experimental fund"	:	:	2,800,000	:	

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<u>INPUTS</u>	<u>UNITS & MEASURES</u>	<u>COST</u> (in U.S. \$)	<u>MEANS OF VERIFICATION</u>	<u>ASSUMPTIONS</u>
<u>WT:</u>	:	:	:	:
EMU Professional Staff (300 pm)	300 pm			
Contract Studies (by Tunisian institution)		\$ 750,000		
Office Space				
	:	:	:	:
	:	:	:	:
	:	:	:	:
	:	:	:	:
	:	:	:	:
	:	:	:	:
	:	:	:	:
	:	:	:	:

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SMALL-HOLDER IRRIGATION DEVELOPMENT SUB-PROJECT PAPER

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET
SUBPROJECT 3

1 TRANSACTION CODE
 A ADD
 C CHANGE
 D DELETE

2. DOCUMENT CODE
PP
3

3 COUNTRY ENTITY
TUNISIA/USAID

4 DOCUMENT REVISION NUMBER

5. PROJECT NUMBER (7 digits)
664-0312.3

6 BUREAU OFFICE
 A SYMBOL: NE
 B CODE: 03

7 PROJECT TITLE (Maximum 40 characters)
Small Holder Irrigation Development

8. ESTIMATED FY OF PROJECT COMPLETION
FY: 814

9 ESTIMATED DATE OF OBLIGATION
 A INITIAL FY: 79
 B QUARTER: 2
 C FINAL FY: 81

10 ESTIMATED COSTS \$000 OR EQUIVALENT \$1000

A FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B PR	C LG	D TOTAL	E PR	F LG	G TOTAL
AID APPROPRIATED TOTAL	310	2400	2710	500	4300	4800
GRANT	210		210	400		400
LOAN	100	2400	2500	100	4300	4400
OTHER US Counterpart		600	600		600	600
MOST COUNTRY		2450	2450		2500	2500
OTHER DONORS						
TOTALS	310	5450	5760	500	7400	7900

11 PROPOSED BUDGET APPROPRIATED FUNDS \$000

A APPROPRIATION	B PRIMARY PURPOSE CODE	PRIMARY TECH CODE		FIRST FY 79		SECOND FY 80		THIRD FY 81	
		C GRANT	D LOAN	E GRANT	F LOAN	G GRANT	H LOAN	I GRANT	J LOAN
1) FN	250	230	230	210	2500	-	-	190	1900
2)									
3)									
4)									
TOTALS				210	2500	-	-	190	1900

12 A APPROPRIATION

A APPROPRIATION	FIRST FY		LIFE OF PROJECT	
	C GRANT	D LOAN	E GRANT	F LOAN
1) FN			400	4400
2)				
3)				
4)				
TOTALS			400	4400

13 DATE OF OBLIGATION SCHEDULED
MM | DD | YY
1 | 1 | 81

13 DATA CHANGE INDICATOR: WERE CHANGES MADE IN THE P10 FACESHEET DATA BLOCKS 12, 13, 14 OR 15 OR IN PRP FACESHEET DATA BLOCK 12? IF YES, ATTACH CHANGED P10 FACESHEET

14 ORIGINATING OFFICE CLEARANCE
1

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

SIGNATURE: *William C. Marshall*
 TITLE: Director, USAID/Tunis (Acting)

DATE SIGNED: MM | DD | YY
1 | 1 | 78

II. SUB-PROJECT DESCRIPTION

A. General

The purpose of this sub-project is to optimize small farmer access to and income derived from agricultural groundwater in the CTED zone primarily through on-farm irrigation infrastructure expansion and secondarily through the diffusion and institutionalization of appropriate on-farm water management practice. The sub-project involves a combination of capital and technical inputs comprising a number of discrete but inter-related types of interventions. Some of these will be predominantly U.S.-financed and others predominantly GOT-financed. U.S. resources are concentrated in those interventions where the Mission is convinced that the maximum small farmer impact and best economic returns lie. The GOT inputs are concentrated in the larger scale public irrigation perimeters where the GOT has already a major stake in both sunk capital and organizational overhead. Below are summarized the major types of interventions and the primary source of finance:

TOTAL GOT/AID PACKAGE OF CTED IRRIGATION INTERVENTIONS

TYPE OF INTERVENTION	A.I.D. Financing	GOT Financing	
		(a) GOT Appropriated	(b) PL480 Generations
<u>JOINT FINANCING</u>			
shallow well improvements	Major share	Minor share	-----
Natural spring development	Major share	Minor share	-----
Surface infrastructure for 5 unused deep wells	Major share	Minor share	Minor share
<u>GOT FINANCING ONLY</u>			
Rehab. of existing public perimeters	-----	Major share	Minor share
New deep well development	-----	Full share	-----
Drainage and small dams	-----	Full share	-----

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This sub-project paper elaborates the entire package because the A.I.D.-financed interventions make sense in the context of the overall package. However, the intervention headings are marked (A.I.D. FINANCING) or (GOT ONLY) to distinguish those items being proposed for funding from those necessary to the project goal, but not-financed. Careful budgetary and planning reviews have been held with both GOT irrigation and planning authorities to sort out the lines of financing and establish both A.I.D. and GOT priorities. In addition to the loan financing of infrastructure development, UNID proposes to grant-finance a small component of technical assistance in water management to insure increased efficiencies of water use by small farmers.

B. Technical Interventions

This is a loan and grant activity to be funded over two years, with implementation and technical assistance running over a five-year period. The loan of 4.4 million would be used to finance selected irrigation infrastructure costs at the farm level, primarily by providing new funds for the existing GOT small farmer medium-term credit channels. Grant funds (amounting to 400,000) will cover a series of short-term technical missions in water management, a very small amount of short-term consultancies and 140,000 for commodity costs relating to field tests of on-farm water management techniques.

The types of irrigation interventions (both A.I.D.-funded and fully GOT-funded) are described below. Full details are provided in the Feasibility Report. 1/

1. Improvement of about 300 Existing Shallow Wells (A.I.D.-FINANCING)

a. Types of Improvements:

Well improvements: (1) deepening wells to about 3 meters below the groundwater table; (2) lining to ground level; and (3) installing either electric or diesel pumpsets.

b. Numbers of wells to be improved

(1) 300 wells in Noussana Delegation (approximately 40 in the Herich sector, 30 in Mezra and 60 in Frika); (2) 23 wells in Djedliane, (9 in Hmeima sector, 14 in Terbah); (3) about 70 wells in Rohia.

1/ Hagan, et al, "Recommendations for Irrigation, Erosion Control and Dryland Interventions," July 1978.

c. Electrification

Cost considerations favor electrification, where possible. The distribution of well sites with respect to the grid suggests that approximately half of the wells can be electrified. This ratio may improve over the life of the project as the grid is expanded. In all cases, an engineer of the CTM will (in accordance with present practice) specify the motor power and pump capacity permitted for each well and make a determination that the well site is acceptable and will not create excessive localized drawdown on the aquifer.

2. Installation of about 200 New Shallow Wells (A.I.D. FINANCING)

a. Number of wells to be constructed

It is estimated that a potential exists for constructing 205 new shallow wells in the project area, located as follows:

(1) 50 wells in Foussana, equipped with diesel pumps (to be located at suitable distances from the existing concentrations at Brika, Mzira and Kerich to avoid local aquifer drawdowns);

(2) 45 wells in the Chaker - Sidi O'hil sector of Thala, equipped with electrical pumps;

(3) 70 wells in Djedliane: 10 in Oued Kerib sector; 30 in the Ameima sector, equipped with electrical pumps; 30 at Terbah, equipped with diesel pumps;

(4) 40 wells in Rohia.

b. Who constructs wells

The excavation will be undertaken by each farmer without using specialized equipment. This comprises his contribution to the investment. The deepening and lining require specialized equipment and considerable material costs. The A.I.D.-funded credit will permit the farmer to hire local entrepreneurs to execute this work related to well lining.

3. Development of About 100 Natural Springs (A.I.D. FINANCING)

Natural springs in the project represent small but low-cost water resources. A spring can irrigate 2-3 ha. if effectively utilized. It can serve two or more families.

a. Nature of spring development

(1) Construction of a concrete tank to conserve overnight flow and provide a sufficiently strong irrigation stream.

(2) Provision of portable outlet pipes to reduce seepage losses.

b. Number of springs

The number of springs to be developed is as follows:

<u>Delegation</u>	<u>Number of Springs</u>
Foussana	27
Thala	5
Djedliene	2
Sbiba	45
Sbeitla	18
Djilma	<u>2</u>
TOTAL:	99

The area irrigated by a spring is comparable to that irrigated by a shallow well, while the investment involved is much smaller (TD 750 vs. TD 2600) and the operating costs are nil. Thus the economic benefits of spring development is obvious.

(4. Development of three New Irrigation Perimeters Based on Four Existing Deep Wells (A.I.D. FINANCING)

The opportunity for exploiting unutilized deep wells is limited to four wells in Foussana and one in Thala delegation. A.I.D. dollar funding will be limited to the four deep wells in Foussana. GOT will fund a fifth in Thala.

The four Foussana wells were capped in 1974 in expectation of Central Tunisia Project funds for their development. The depths of these wells range from 200 to 500 meters. Their characteristics are as follows:

<u>Designation</u>	<u>Discharge (l/s)</u>	<u>Irrigable Area (ha)</u>
SF 4	50	120
SF 5	50	
SF 6	20	30
SF 3	20	60
TOTAL	<u>140</u>	<u>210</u>

The SF perimeter will be planted entirely with fruit trees, which explains its large area in relation to the available discharge. The SF 4-SF 5 command areas (which form one perimeter) and the SF 6 perimeter are planned for forage crops and vegetables. U.S. loan funds and PL 480 counterpart funds will be utilized for investments in pumpsets, reservoirs, canals, interior roads and levelling. The CTDA Director of Infrastructure and Land Tenure Affairs will manage this loan component. Investments in tree plantations, stables, livestock, etc., will occur under a sub-project scheduled for development during the first two years of this project.

Since these perimeters are at present dry-farmed (barley) and contain no fences or residences, the land distribution process is expected to be straightforward.

With the above A.I.D. and parallel GOT interventions, infrastructure will be essentially complete with the exception of future levelling which will be addressed by the GOT (TD 120,000).

5. On-farm Water Management (A.I.D. GRANT FUNDING)

The project will make an initial input of \$210,000 into Technical Assistance for water management for the first two years of the project. If the evaluation of the first stage is positive, an additional \$190,000 is programmed for the remaining three years of the project life. Only the first phase TA intervention is described in this paper because the second element will be jointly designed by the CTDA and USAID on the basis of the first two years' experience.

The TA would be provided by the same land grant university contracted for the drylands project. This university would undertake to support the water management components with sustained short-term consultants and a continuity of project backstopping in the U.S..

The first element of the water management intervention would be two field observation and analysis consultancies (2PM ea.) to observe winter and summer irrigation practices on irrigated small farms in Central Tunisia and review water management policy with the technical staff of the CTDA.

On the basis of these two analyses, the contracting university would formulate with CTDA a program for the next 24 months. This program would center on controlled field testing of alternative water management systems. These tests would be designed with the support of the contractor, who would also make periodic visits to Tunisia to monitor and advise on the program. At the end of the first year of tests, the contractor would hold an extensive review with the CTDA technical staff and identify procedures which can be introduced directly into the CTDA extension program. This

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review would also be the occasion for the redesign of the second year of field testing.

The TA intervention provides for \$60,000 in short-term applied training (U.S. or third country) in water management for CTDA staff to be designed and managed by the contractor. It also includes \$40,000 for the contractor to procure specialized commodities for use in the conduct of water management field tests.

The CTDA will be the chief implementer of the field testing program since it is the agency which will have to utilize the results in its extension system. The contractor's role will be centered on design and advising. It is judged best not to specify the precise types of consultancies over the life of the first funding tranche. It is believed that the contractor will be in a better position to make these determinations after conducting the initial field observations in winter and summer growing seasons of the 79 - 80 crop year.

C. Choice of Flood Irrigation Technology

The Mission has considered a number of alternative techniques of water delivery in this intervention. Each has advantages and costs. The decision settled on flood irrigation because although it is the most "inefficient" in the use of water, it was deemed to be the most efficient in terms of Central Tunisian costs and reliability.

1. Sprinkler systems eliminated because of:

a. The high cost per unit. The yields on these shallow wells (about one litre per second) limit the size of the cultivated unit. At the scale possible, the capital costs of the sprinkler systems would be prohibitive. Sprinkler systems are well known in Tunisia. Some USAID sprinkler systems from the 1960's are still in evidence and many new systems are in operation. They are confined, however, to areas like Cap Bon where high value crops and market economics have favored heavy capital investments.

b. Wind problems

Experienced Tunisian irrigation engineers argue that the high winds in the Central Tunisia region would seriously reduce the effectiveness of sprinkler systems.

c. Extreme evapo-transpiration rates

The intense solation received by the area and the low humidity in this semi-arid zone caused the Tunisian irrigation engineers to

assert that sprinklers would encounter operating problems in Central Tunisia. Recourse to night-time sprinkling would be limited because this is the period of most intense desert wind activity.

2. Drip Systems Eliminated because of:

a. Poor fit with the crop mix

Trickle irrigation is generally accepted as being best suited to permanent tree and vine crops and crops under cover. The present marketing situation in Central Tunisia favors irrigated forage crops (lucerne, clover) and vegetables, including potatoes and carrots as well as summer tomato crops.

b. Water quality problems:

(1) Mineral content. The emitters in drip systems are easily clogged by precipitates from limestone or iron containing waters. Mineral content of Central Tunisia well water is extreme.

(2) Suspended sand and silt. Even more severe clogging problems occur when irrigation water in drip systems carries heavy loads of suspended silt and sand. The open well, shallow aquifer situation in this area insures high sediment loads in the water. A day's irrigation often leaves 40 pounds of mud in the concrete reservoir of a Central Tunisian shallow well.

c. Availability and supportability of equipment

Trickle irrigation requires highly precise, difficult-to-manufacture components, particularly the filters and emitters. The range of such equipment on the market is still limited worldwide and no designs have been fully field proven and debugged. It is still a technology in transition from the experiment station to commercial application. No drip equipment proven under Central Tunisian conditions is available and no drip equipment has dealer and maintenance networks in Tunisia. Major drip projects in neighboring Libya are still in the trial phase.

d. Ability of the Central Tunisian well farmer to employ the system:

The beneficiaries of the small farmer irrigation intervention are less than a generation away from nomadism. They have only partially adapted to the rudiments of settled dryland agriculture. The Mission and the Tunisian agricultural authorities seriously doubt the capacity of the majority of these farmers to install, operate and maintain sophisticated irrigation technologies. The typical farmer in this sub-project

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is perhaps 5 kilometers from a farm track and 15 kilometers from an all weather road. He has no regular access to a full-scale market town except when he makes a day's journey by horse or mule. Entrepreneurs do get his basic farming needs out to him with tough camionette trucks working off the established roads, but he must wait until they choose to come; he has no independent means of communication with the city or town. In short, he cannot operate a sensitive and complex system which requires expert maintenance and support.

Where the selection of flood irrigation is virtually foregone, there are wide ranges of possible efficiencies within this technique. Much of the most valuable California cash crop land in the Jacquin, San Fernando and Imperial Valleys is flood irrigated. The challenge is to do it right. Tunisian and U.S. irrigation authorities are agreed that the present small farmer approach to flood irrigation in Central Tunisia could be greatly improved. The current market relationships yield such a high return on even poorly managed irrigated production that the existing irrigating farmer group has not been forced by market pressure to improve. The irrigation sub-project, however, includes 400,000 for technical assistance (short-term TA, probably mostly in two-month blocks) to (1) identify the major possibilities for increased efficiencies in water and water management; (2) to design and supervise field tests of improved techniques to be implemented by the staff; and (3) to commence the TA staff in initiating a water management component to the existing extension system in Central Tunisia. The aim of this TA component is modest. By the conclusion of this project, virtually all the groundwater potential for agriculture will be exploited. Massive investment in irrigation TA is simply not warranted in the way it might be in an area development program in Egypt or the Punjab.

D. Expected Outputs

As noted in a preceding section of the proposal, results or outputs may be expected early during the life of the project. Implementation can start soon after authorization of funds. The preparatory phase is minimal. Also administrative support and technical implementation requirements are relatively simple. Implementation should be underway midway of CY 1979.

<u>TYP. OF INTERVENTION</u>	<u>NUMBER OF POTENTIAL INTERVENTIONS</u>
Improvement of existing shallow wells (deepening, lining, motors, etc.)	300
Construction of new shallow wells	205

<u>TYPE OF INTERVENTIONS*</u>	<u>NUMBER OF POTENTIAL INTERVENTIONS</u>
Development of natural springs	99
Development of new irrigation perimeters with existing deep wells	3
Improvement of functioning irrigation perimeter (T. only)	4

From the above interventions, it is estimated that approximately 1,000 - 1,500 ha. of land will be brought under irrigation, and improved irrigation (increased water supply per ha.) of an additional 2,000 ha. will result from improvements to existing perimeters. Roughly 3,000 families will be benefited. In addition, the improvements in on-farm water management will have some impact on this same population.

Some off-farm employment will be generated (not too much since most is family labor); on the order of 200 to 300 additional jobs.

Effects on unit yields will be discussed under the "Economic Feasibility" section of "Project Analyses".

III. SUB-PROJECT SP. I-10 ANALYSIS

A. Economic Feasibility

1. Costs and benefits of surface wells

Field data collected by the Mission and review of the available documentation indicated the yields, prices and benefits from irrigated crops on small holdings in the project area to be approximately as shown in Table I (Page 11). These values are necessarily estimations; thus a range is given for most yields and prices rather than a single value.

Mission observations showed the area irrigated by each surface well to be planted approximately as follows:

<u>SUMMER CROPS</u>		<u>WINTER CROPS</u>	
Tomatoes	0.35 ha	Carrots	
Peppers	0.25 ha	Turnips	0.80 ha

* SEE: Agar et al op cit: Section III, pp 1-22 and Appendix A, Tables A-2, A-3, A-4 and A-5

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SUMMER CROPS

Melon	
Watermelon	
Cucumber	
Pumpkin	0.15 ha
Onions	0.10 ha
Potatoes	
Maize	
Sorghum	
Minor Crops	0.05 ha
Alfalfa	0.10 ha
<u>TOTAL</u>	<u>1.00 ha</u>

WINTER CROPS

Onions	0.20 ha
Beans	
Peas	
Cabbage	
Cauliflower	
Fennel	0.40 ha
Barley	0.50 ha
Alfalfa	0.10 ha
<u>TOTAL</u>	<u>2.00 ha</u>

This cropping pattern, with the benefits of different crops as shown in Table I, indicates that the value added by irrigation (excluding pumping costs) is approximately 1,300 TD/year per surface well. This calculated value agrees with the expectation expressed by farmers to recover the investment in well and pump in a year or two.

The existing cropping pattern has been retained for purposes of the economic calculation. In practice, however, the project will encourage the planting of forage crops (especially alfalfa) on at least 25 percent of the irrigated area.

The alternative use of the land (as unimproved pasture) has a very low net benefit on the order of TD 10/year which is negligible in this context.

The cost of a surface well is taken as 1,500 and of a pump as TD 500. Fuel and lubricants are estimated at TD 70/year, and maintenance at TD 80/year.

To calculate the economic internal rate of return, it was assumed that (1) the useful life of the well is 50 years and of the pump 10 years; (2) utilization starts the year the well is constructed, and (3) net benefits will be 50 percent of steady-state conditions in the first year; 75 percent in the second year, and 100 percent from the third year on. With these assumptions, the internal rate of return on surface wells is 30 percent. This very favorable rate is due to the high value of the crops grown (vegetables and alfalfa) and to the rapid utilization of the investment.

TABLE I

YIELD, PRICE AND BENEFIT FROM IRRIGATED CROPS

CROP:	Alfalfa	Tomatoes	Peppers	Onions	Melons & Watermelons	Potatoes	Carrots & Turnips	Beans (in pods)	Barley
(1) Yield, t/ha.	10-15	15-20	6-10	15-20	14-20	7-10	8-10	6	2
(2) Price, TD/t	60-80	40-50	80-100	40-50	60-70	90-120	40	100-120	50
(3) Gross Benefit, TD/ha. ha.-(1) X (2)	900-1200	600-1000	600-1000	600-1000	840-980	840-1200	20-400	600- 72	100
(4) Inputs (ploughing, seed, fertilizer, etc.), TD/ha.	80	80-230	80-300	80-110	150	180-360	100-110	80-120	40
(5) Value added by irriga- tion - (3) - (4)	820-1120	520-770	520-700	520-890	690-830	660-840	220-290	520-600	60
(6) Labor, days/ha.	76	125	154	113	124	118	50	60	24

Sources: "Evaluation of the Agricultural Potential of Central Tunisia", University of Missouri-Columbia, April 1978; "Données Agro-Economiques de Base sur la Tunisie Centrale", CNRS, April 1978; "Vulgarisation Agricole dans les Périmètres Irrigués du Gouvernorat de Sidi Bou Zid - Rapport No. 1/2 - Agro-Economie", FAO, April 1977; CAVR - PPI (Sbiba); Mission observations.

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The above calculation implicitly assumes the shadow price of the farmer's labor to equal zero. This assumption influences the calculation, and the use of an alternative value for this shadow price would lower somewhat the IRR's. The Mission prefers the zero value assumption because the real wage opportunities are so few in the region as to make the assignment of a shadow wage problematic at best, but recognizes that it is an arguable assumption.

The total effect of the surface-well sub-project (new wells, improvements of existing wells and springs) will be an added value of about TD 650,000 annually for the region. If this benefit is compared, under the same assumptions, to the sub-project investment cost of TD 1,800,000 (Table I) plus the extension costs, the calculation shows that the economic internal rate of return for the surface-well sub-project as a whole is a respectable 29 percent.

2. Economic Value Added by Labor

The cropping pattern shown above was calculated to require 224 labor days per year for each surface well perimeter. Such labor requirement is well within the capacity of the family labor force. To calculate the economic return of labor, it was assumed that the well will be amortized over 30 years and the pumpset over 10 years at a rate of 10 percent, which approaches the real cost of capital in Tunisia. Under these conditions:

- Value added (excluding irrigation costs)	TD 1,300
- Operation (TD70) and maintenance (TD30)	150
- Amortization of well and pump	<u>290</u>
Net Value Added	860

Thus the economic value added by the farmer's use of his land, labor and management inputs equals about TD 3.840/day.

3. Financial Return to the Farmer

As mentioned before, the farmer will be expected to excavate his well to the groundwater level. The project will provide credit for deepening, lining, above-surface reservoir when necessary, and pumpset and pumpset accessories. Credit for these inputs amounts to some TD 408/year over a 7 year repayment period. Subtracting this amount and the operation and maintenance costs (TD 150/year) from the value added (TD 1300/year) leaves the farmer a cash income of TD 742/year once steady-state is achieved (third year of operation). This amounts to financial return of some TD 3.300 per labor day.

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4. Costs and Benefits of Deep-Well Irrigated Perimeters

The project proposes construction of the surface irrigation systems necessary to utilize the existing capped deep-wells at SF3 (20 l/s), SF4 (50 l/s), SF5 (50 l/s), SF6 (20 l/s), and Tin Hala (30 l/s). Calculation of the economic benefits of these projects is based on the following assumptions:

a. The cropping pattern has been assumed to be similar to the one shown above for surface wells to facilitate comparison. Note, however, that in the case of the deep-well perimeters, the area irrigated in the winter cannot be larger than that irrigated in the summer since it is limited by the extent of the irrigation system. (In the case of the deep-well perimeters also, the project will push for expansion of fodder crops.

b. Benefits have been decreased by 10 percent with respect to Table 1 to allow for the fact that deep-well beneficiaries (who are persons that happen to own land near a deep-well site) typically show lower yields than surface-well owners (who are a group of self-selected agricultural entrepreneurs, and who also have more control over their water source).

c. Utilization was assumed to start the year after construction because of the time necessary for irrigation system construction and land parcelling.

d. The useful life was taken as 20 years for the borehole and the irrigation network; 30 years for constructions, and 10 years for mechanical and hydraulic equipment and for interior roads.

e. Net benefits were assumed to reach 50 percent of steady-state benefits in the first year; 75 percent in the second year, and 100 percent from the third year on.

Based on these assumptions, the value added per hectare (before considering irrigation costs) will be about TD 900/year.

According to the feasibility studies, the costs of developing the deep wells at Foussana were, in the beginning of 1978, as follows:

1/ "Création de Périmètres Irrigués dans le Centre et le Sud Tunisien" - Périmètre de Foussana SF4 - Foussana SF5 - Project: "Périmètre de Foussana SF3 - Project: "Périmètre de Foussana SF6 - Project d'Exécution"; SCFT/Tunisie, April 1978.

	<u>SF3</u>	<u>SF4 & SF5</u>	<u>SF6</u>
Irrigated area, ha.	62	120	31
Cost of irrigation system (TD)	72,925	203,192	53,350
Cost per hectare, irrigation system only (TD)	1,177	1,693	1,721
Cost of well, at current prices (200 TD/m) (TD)	81,000	242,000	41,800
Depth of borehole(s), m	405	1,210	209
Total cost (well & irrigation system) (TD)	153,925	153,925	95,150
Total cost per hectare (TD)	2,483	3,710	3,069

The largest (120 ha.) perimeter, to be irrigated by wells SF4 and SF5, has the highest per hectare cost owing to the very deep boreholes. If for this perimeter the well is regarded as a (literally) sunk cost, and the value added by irrigation is compared only with the additional investments required to construct the water distribution system, these investments show the satisfactory internal rate of return of 29 percent. The other perimeters, which have lower per-hectare costs, will show correspondingly higher returns.

These deep wells have been unutilized since 1975. If the cost of drilling the very deep (average 605 m) SF4 and SF5 wells is actualized, at present prices, and added to the perimeter development costs, the analysis still shows a passable internal rate of return of 11.5 percent. If the SF4/SF5 perimeter were constructed within 2 years of drilling the wells, as is usually the case, the project would have shown an internal rate of return of 13 percent.

The above figures point to the conclusion that:

(1) Constructing the distribution systems for existing wells (which may be regarded as a sunk cost) is an economically attractive proposition, with rates of return of 29 percent or higher, and may be recommended for USAID financing.

(2) The drilling of new deep wells and construction of their irrigation systems is economically acceptable, with internal rates of return of 13 percent or above, but much less attractive than the creation of new surface wells, which shows a rate of return of 39 percent.*

* A.I.D. funding will be used for the latter (39 percent) interventions, while the GOT plans to fund new deep wells despite the lower (13 percent) return.

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- Salinity and Drainage Problems

The report finds that salinity and drainage problems do not seem to be a significant constraint to the development of a well-irrigation program, thanks to a good water quality and to the adequate slopes at the well sites. Only in Tolia were some saline sites reported and these have proven to be the result of a recently built watercourse barrier which has raised groundwater levels in the area. No such dams are projected in any of the A.I.D. well sites.

B. Administrative Feasibility

(See relevant section in the project paper and following details.)

1. Public Irrigated Perimeter

The OTM, when established in Kasserine, will absorb the present regional office of the ONDA for Kasserine Governorate and, therefore, will inherit a qualified and experienced staff which can provide direct supervision over the development of the three perimeters for the four existing deep wells in Soussan. The actual work will be performed by public enterprises (e.g., studies, tenders for land levelling, if needed) and/or private enterprises (for construction of the irrigation network). Bid packages for the three perimeters have already been completed.

2. Surface Wells

The ONDA will recruit personnel specifically for the purpose of assisting the small farmers in obtaining credit for construction and improvement of surface wells. Concurrently, other ONDA staff members will be working with the Delegations in each delegation to accelerate the distribution of credit rates of production to farmers. We expect our two proposed ONDA interventions to accelerate credit utilization by small farmers. It should be noted that farmers who have obtained credit for surface wells heretofore have been successful in increasing their income and have not experienced difficulties in reimbursing loans.

3. Springs

No problem is anticipated inasmuch as these interventions will be grant-financed. Since only a few families will use the water from each spring, there should be no serious water allocation problem.

4. On-Farm Water Management

The ONDA extension staff will be responsible for assisting small farmers in improving the use of irrigation water, with U.S. short-term technical assistance. While the ONDA staff already in place in Kasserine

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Governorat has only barely begun extension activities in shallow well areas, it is expected that this process will be accelerated following establishment of the PIP.

B. Environmental Analysis

(See relevant section in project paper.)

IV. FINANCIAL PLAN

The following table summarizes the financial plan for the three-year fiscal period of 1979 through 1981. The U.S. contribution will consist of a grant of \$400,000 and a loan of \$4,400,000. Subject to the availability of funds, the PIP will finance the project each fiscal year indicated on an incremental funding basis in accordance with the financial plan below.

A loan of \$4,400,000 will be made available to the PIP. A portion of these funds (approximately \$3,100,000) will be sub-loaned to area farmers for surface well improvements. These improvements include deepening and lining; acquisition of diesel or electric pumps and portable outlet pipes; connection and installation of transmission and distribution lines - where wells exist and where electric pumps are recommended; and some construction of new surface reservoirs. The beneficiary, however, or beneficiary, would complete excavation to the groundwater level. The excavation will be done in his own time and at his own expense. These funds will not be used for surface well improvements in any other area. Further explanation of the program mechanism and credit needs for extending credit to area farmers for surface well improvements is contained in Section 5, Implementation Plan. Some \$200,000 will also be made available for development of natural springs, i.e., construction of concrete reservoir tanks and installation of portable outlet pipes. The remaining \$1,000,000 will be utilized by the PIP for the development of public irrigation perimeters (PIPs) based on their existing deep wells in Kaysara. PIP development will include investments in pumps, transmission lines, interior roads and leveling. Development of investments during for both natural springs and PIP investments will be obtained through a water use levy and taxes.

The PIP component will be provided from approximately \$200,000 and \$1,400,000, Title I counterpart proceeds. The other equivalent of \$3,100,000 (\$2,500,000 in appropriate funds and \$600,000 in PIP proceeds) will be used for rehabilitation of existing PIP's, new deep-well and PIP development, and for drainage and small dam development.

The total cost of the project is \$4,800,000 of which \$4,400,000 will be provided by the loan and grant funds and the other equivalent of \$3,100,000 will be provided by the PIP (approximately 64 percent of total project costs). The U.S. contribution is projected as follows: FY 1979 - \$3,050,000; and FY 1980 - \$50,000. Proposed A.I.D. fiscal year appropriations

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are: FY 1979 - \$2,20,000; and FY 1981 - 1,500,000.

Funds made available under this sub-project will be disbursed as follows:

D. In the case of public irrigated perimeters, the GGT will be reimbursed for actual costs incurred for specific segments of the work and up to a maximum (for each request) fixed at the time the final design is accepted. The same procedure will apply to springs.

E. In the case of credit for surface wells, disbursement will be handled in the same manner as disbursements for local costs under the Small Farmer Supervised Credit Project. An advance will be made to establish the credit fund on the basis of a 10% statement identifying the lending account in the National Bank of Tunisia (NBT) and a jointly derived projection of the amounts to be loaned during the first year of operation of the loan fund. Replenishment of the fund will be at the pace required by actual borrowing. The responsibility for cash disbursements for irrigation development will be shared between the project and the credit fund. The credit fund will be replenished by the project at a rate of 10% of the initial credit available to the project. The credit fund will be replenished by the project at a rate of 10% of the initial credit available to the project. The credit fund will be replenished by the project at a rate of 10% of the initial credit available to the project. Additional NBT projects (including irrigation, credit, and agricultural credit facilities) are already included on the NBT. It is anticipated that we will have a good working relationship for credit and agricultural credit facilities through the life of the NBT project.

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000 U.S. DOLLARS

	<u>FY 1979</u>	<u>FY 1980</u>	<u>FY 1981</u>	<u>Total</u>
<u>U.S. COMPONENT (Loan & Grant)</u>	<u>2,710</u>	<u>-</u>	<u>2,090</u>	<u>4,800</u>
<u>Loan</u>	<u>2,500</u>	<u>-</u>	<u>1,900</u>	<u>4,400</u>
Surface well improvements	1,400	-	1,800	3,200
Natural springs development	100	-	100	200
Small scale PIP development	1,000	-	-	1,000
<u>Grant (Water Management Plan)</u>	<u>210</u>	<u>-</u>	<u>190</u>	<u>400</u>
Short-term consultant services	160	-	140	300
Short-term participant training	30	-	30	60
Project commodities for field tests	20	-	20	40
<u>CO-FINANCING</u>	<u>3,050</u>	<u>50</u>	<u>-</u>	<u>3,100</u>
<u>Appropriated funds</u>	<u>2,450</u>	<u>50</u>	<u>-</u>	<u>2,500</u>
Existing PIP rehabilitation**	1,750	-	-	1,750
New deep well development	500	50	-	550
Drainage and small dams	200	-	-	200
<u>UN-APPROPRIATED Counterpart Funds</u>	<u>600</u>	<u>-</u>	<u>-</u>	<u>600</u>
PIP development*	200	-	-	200
PIP rehabilitation**	400	-	-	400
<u>PROJECT TOTAL</u>	<u>5,760</u>	<u>50</u>	<u>2,090</u>	<u>7,900</u>

* Around existing unutilized deep wells

** Sbiba, Thala and Djilma

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V. IMPLEMENTATION PLAN

A. U.S. Monitoring Responsibility

(See Administrative Feasibility - Implementation Plan in Project Paper)

B. CGT Monitoring Responsibility

(See Administrative Feasibility - Implementation Plan in Project Paper)

C. Implementation Responsibilities

The CTDA will be responsible for overall implementation of the sub-project including:

1. Public Irrigated Perimeters and Springs

The CTDA will contract with Tunisia private enterprise for the construction of irrigation systems. It will be responsible for monitoring work in progress and disbursing funds to the contractors.

Prior to initiation of construction, the CTDA will obtain assistance from the Land Reform Agency and the Delege of the Delegation concerned in resolving any land titling or distribution problems within the areas to be assisted.

Maintenance of such structures, and dams, roads, wells or related facilities, will be the responsibility of the CTDA.

2. Surface wells

As noted earlier, the same credit terms, conditions and procedures applicable to medium-term loans under the Small Farmer Supervised Credit Project (SFC-OROP) will apply to the credit portions of this sub-project. There are certain special aspects, however, related to this sub-project. They include:

a. The CTDA will be responsible for technical management of this sub-project (instead of the Director of Agricultural Production of the Ministry of Agriculture).

b. The CTDA will replace the Ministry of Agriculture on "local credit committees".

c. The CTDA will assist local farmers in preparing loan applications, in processing loans through "local credit committees", and in certifying vouchers for equipment, materials, and for services provided

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to farmers/borrowers - presented by the suppliers for payment.

d. Special procedures (See annex for credit documentation)

Similarly, as in the case of public irrigation perimeters, all problems associated with land titling, etc., will be settled with the help of the CTED prior to initiation of individual well developments or improvements.

The National Bank of Tunisia (BNP) will be responsible for the financial management of the credit. This will consist primarily of making reimbursement to suppliers for equipment, materials, and services provided to borrowers, and collection of loan interest and repayment of principal.

Criteria for selection of borrowers will be: first come, first serve; one well per farmer; and a certificate of possession.

All loans will be repaid upon engineering certification, to be provided through CTED, attesting that the establishment of an individual well will not result in local or general aquifer exhaustion.

3. Technical Assistance

The CTED will contract with a single U.S. university for advisory and training services under both this sub-project and the Dryland Farming Systems sub-project (see Section II, 2, 6 on Farm Management for details).

4. Supporting Services for Project Implementation

a. Deepening and lining of shallow wells will be carried out by contractors already established in the area and/or those new contractors which will be developed with assistance of the non-agricultural enterprises section of DANPS.

b. Supply, maintenance and repair of pump sets for shallow wells will be carried out by small merchants who will be assisted by the non-agricultural enterprises section of DANPS.

B. Implementation Schedule

(See Project Paper)

II. EVALUATION PLAN

(See Project Paper)

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VII. CONDITIONS, COVENANTS, AND NEGOTIATING STATUS

(See also the Conditions and Covenants Section of the Project Paper).

Conditions Precedent

A. Technical Assistance

Before any disbursement can be made for technical services, a contract acceptable to A.I.D. must be signed between the GOT and a U.S. land/grant institution for the provision of such services.

B. Disbursement of Funds for Public Irrigated Perimeters and/or Springs

1. As a condition precedent to financing public irrigated perimeters or springs, A.I.D. shall approve the construction contract for each perimeter and the general contract format that the CTDA will be using for spring site construction.

2. As a condition precedent to disbursement of funds for construction of public irrigated perimeters, the CTDA will provide satisfactory evidence that all farmers in the perimeters have a clear legal right (certificates of possession or title deeds) to the land they occupy and that acceptable number of beneficiaries will be served by each perimeter.

C. Financing Small-Farmer Credit for Surface Wells

The following conditions must be met before disbursements can be made under the small farmer credit component of this sub-project:

1. An agreement must be in effect between the CTDA and the BNT regarding the responsibilities of each party and the procedures to be followed in implementing the credit portion of the sub-project.

2. The CTDA must furnish satisfactory evidence that an adequate number of credit agents, extension agents, and engineers qualified to make engineering certifications of loan applications are assigned to work in the areas covered by the surface wells portion of this sub-project.

Covenants

A. The GOT agrees to operate and maintain in good working condition all public irrigated facilities financed under this sub-project for a period of no less than 10 years.

B. GOT agrees that small farmers operating private irrigation wells shall be provided inputs and advisory services routinely made available to farmers on public irrigated perimeters.

PURPOSE	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS	
Optimize Small-Farmer access to and income derived from agricultural groundwater in the CTRE region primarily through infrastructural expansion and secondarily, through diffusion and institutionalization of relevant water management practices.	<p>11. Total utilization of agricultural groundwater resources with optimal beneficiary spread to about 3,500 small farmers</p> <p>12. Optimization of agricultural groundwater access by capital and technical intervention:</p> <p>a. Capital:</p> <ul style="list-style-type: none"> -Shallow wells improved:600 households -Shallow wells new construction: 225 households -Natural Springs development:250 households -New Irrigation Perimeter development: 210 households 	<p>a. Target as percentage of potential small-farmer irrigation beneficiaries in the region: 100%</p> <p>b. Target as percentage of total farm households in region:11%</p> <p>a. Capital:</p> <ul style="list-style-type: none"> - Target as percentage of households served by all capital interventions: 46% - Target as percentage of households served by all capital interventions: 18% - Target as percentage of households served by all capital interventions: 19% - Target as percentage of households served by all capital interventions: 17% 	<p>Base-line studies</p> <p>Sample Surveys</p> <p>CTRA Information System</p>	<p>1. Agricultural prices will continue to provide incentives for those small-holders who invest in private irrigation development.</p> <p>2. The Certificate of Possession accrediting system for small-holder operations through CTDA interventions and Delegue support.</p> <p>3. The system of small farmer credit assistance already developed by A with the GOT can be followed, in terms of procedures, also in this project.</p> <p>4. The CTDA will be able to assign special staff for purposes of effectively handling infrastructure and water use technical assistance inputs.</p>

PURPOSE	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
	b. Technical Assistance: <ul style="list-style-type: none"> -Improved water management practices on small farms with privately owned irrigation: <ul style="list-style-type: none"> -Full adopters - 400 -Partial adopters - 1,100 -Improved water management practices by small farmers on public irrigation perimeters: <ul style="list-style-type: none"> -Full adopters - 400 -Partial adopters - 1,800 -Improved whole system water management on public irrigation perimeters: <ul style="list-style-type: none"> -Major improvements - 4 -Minor improvements - 10 	CTDA information system CTDA information system	5. The CTIA can effectively engage and supervise private contractors for irrigated infrastructure development. 6. The limited amount of U.S. technical assistance provided for water use management improvement will be sufficient to encourage the CTIA to go forward effectively with training and extension work concerning this subject.
	13. Income Changes: <ul style="list-style-type: none"> a. Major income changes resulting both from new entry into irrigated farming and improved water management: <ul style="list-style-type: none"> Per Capita Income gains in the 50% to 300% range for 1,300 households b. Incremental income changes resulting from technical improvements in On-farm water management: (no capital input) <ul style="list-style-type: none"> Per Capita income gains in the 5% to 25% range for 2,200 households 	Sample Surveys CTDA information system	7. Effective CTIA-operated systems of information flow and analysis can be developed in order to adequately measure changes. 8. Water practices and management systems suitable to on-farm water applications in the CTIA region can be developed and adequately tested during the first year of this project.

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PURPOSE	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
4. CTDA organization, staff, and procedures effectively assisting technology diffusion among 3,500 farmers in 8 Delegations	-Ratio of farmers served by CTDA extension staff with water management training, per delegation 1/340 -Ratio of Ingenieur Adjoint and Adjoint Technique to 11 shallow well and natural spring sectors (20/60 wells or springs per sector) is 1 Ingenieur Adjoint or 1 Adjoint Technique/sector.	CTDA management records CTDA information systems Special Studies Special measures developed by technical assistance contractor	9. Effective, French-speaking, technically qualified American short-term technical assistance can be steadily accessed in terms of CTDA-defined needs concerning water use practices and water management.
5. Farmers in 1983 using water with substantially increased efficiency over 1979 base-line.	-For a given well, yields in liters/seconds showing an increase in any two of the following: * Area cultivated under irrigation * Net annual yield per unit cultivated area * Cropping intensity	Technical measures introduced by technical assistance contractor CTDA information system	

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OUTPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
A. <u>Loan</u>	A. <u>Loan</u>		
1. Development/improvement small-farmer irrigation infrastructure according to cost-effectiveness criteria appropriate to CTRD area	a. Improved shallow wells 300 b. New shallow wells 200 c. Developed natural springs 99 d. Development new irrigation perimeters 3	Records of loans Site surveys Records of CTDA	11. Adequate technical criteria for approval and development of sites will obtain early agreement as between CTDA and AID.
2. Small farmers assisted through capital support for irrigation development	a. Electrical pump sets at TD 1,250/well (est.) 145 b. Diesel motor pump sets at TD 800/well (est.) 54 c. Lining and deepening shallow wells at TD 1,500/well (est.) 293 d. Small improvements in wells at TD 400/well (est.) 200 e. Infrastructure for natural spring sites at TD 750/site (est.) 99	BNT records Sites surveys CTDA information system	12. Current estimates on costs of infrastructure development are not badly skewed during the first three years by supply or inflationary factors.
3. Development of new public irrigated perimeter facilities	Deep well new irrigation perimeters in Foussana at TD 100,000 each (average) 4 deep wells in 3 provinces	CTDA records	13. Adequate numbers of private contractors will be involved so as to insure timely performance in meeting infrastructure installing targets. 14. Suitably qualified CTDA engineers can be quickly assembled so as to insure timely certification of the proposed construction and environmental specifications/effects of each intervention.

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OUTPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
3. <u>Technical Assistance:</u>			
1. CTDA extension staff trained in water management practices by CTDA trainers	CTDA staff in each of 8 delegations 100	CTDA information system	5. CTDA engineer and water use extension staff sufficiently mobile so as to effectively reach farmers.
2. Engineers, technicians, trained specially in water management practices	CTDA staff in each of 8 delegations and headquarters staff 11	CTDA records on training/staffing	6. CTDA, at a policy level, becomes increasingly convinced of the value of improve water use practices and management on small farmer private irrigate fields.
3. Water management practices appropriate to some of the needs of the CTDA area developed and tested	A distinct number of different kinds of practices field-tested, costed, and used for training of CTDA staff	CTDA information system Packages and practices recorded	7. Effective means can be found to foster improved water use practices and management on public irrigation perimeters.
4. Extension of water management practices established as an operative function of the CTDA.	Staff trained, assignment and procedural systems operative, and measures of efficiency in contact and advisory work installed.	CTDA records CTDA staff assignments CTDA budget allocations	
5. Basis laid for more vigorous expansion of water management practices farmer-training by CTDA after 1981.	Data assembled showing increased efficiencies of farmers attainable with improved water use as advised/assisted by CTDA	Technical assistance contractor-provided criteria and measures.	

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INPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
<u>U.S. GRANT</u>		Loan Agreements and Project Agreements	1. The necessary Loan Agreements and Project Agreements will be negotiated on schedule.
a. Equipment Small-scale technical equip- ment for on-farm water management experiments	\$40,000	Records of Disbursements GOT budget allocations and disbursements	2. CTDA will come into effective operation very early in the life of the project.
b. Technical Assistance Short-term consulting servi- ces	\$300,000	CTDA records CTDA information system	3. Systems of farmer loans, site selection, private contracting, and provision of technical assistance will become operational during the first six months of the project.
c. Participant Training Short-term	<u>\$ 60,000</u> \$400,000		
<u>LOAN</u>			4. GOT investments in improving agricultural water resources and use in the CFRD area will expand at some reasonable level.
a. Surface Well Improvements	\$3,200,000		
b. Natural Springs Development	200,000		
c. Deep well development	<u>1,000,000</u> \$ 4,400,000		
2. <u>GOT</u>			
Rehabilitation of existing perimeters	\$1,750,000		
New deep well development	550,000		
Drainage and small dams	<u>200,000</u> \$2,500,000		

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Kanjan
of the CRD

DRYLAND FARMING SYSTEMS RESEARCH -
SMALL HOLDERS SUB-PROJECT PAPER

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

SUB-PROJECT 2

1. TRANSACTION CODE: **A** (ADD), **C** (CHANGE), **D** (DELETE)

2. DOCUMENT CODE: **PP**

3. COUNTRY ENTITY: **TUNISIA/ USAID**

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): **664-0312.2**

6. BUREAU/OFFICE: A SYMBOL **NE**, B CODE **03**

7. PROJECT TITLE (Maximum 40 characters): **Dryland Farming Systems Research - Small Holders**

8. ESTIMATED FY OF PROJECT COMPLETION: **84**

9. ESTIMATED DATE OF OBLIGATION: A INITIAL FY **79**, B QUARTER **2**, C FINAL FY **81** (Enter 1, 2, 3 or 4)

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FA	C. LC	D. TOTAL	E. FA	F. LC	G. TOTAL
AID APPROPRIATED TOTAL	900	100	1000	1820	980	2800
GRANT	900	100	1000	1820	980	2800
LOAN						
OTHER						
1. U.S.						
2.						
HOST COUNTRY		1540	1540		2640	2640
OTHER DONOR(S)						
TOTALS	900	1640	2540	1820	3620	5440

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 79		H. 2ND FY 80		K. 3RD FY 81	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	250	230		1000		780		1020	
(2)									
(3)									
(4)									
TOTALS				1000		780		1020	

12. IN-DEPTH EVALUATION SCHEDULED

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT	
	P. GRANT	Q. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN
(1) FN					2800	
(2)						
(3)						
(4)						
TOTALS					2800	

MM **10** YY **81**

13. DATA CHANGE INDICATOR: WERE CHANGES MADE IN THE PID FACESHEET DATA BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? 1 = YES, ATTACH CHANGED PID FACESHEET

1 = NO
 2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: *Herman G. Marshall*

TITLE: **Director, USAID/Tunis (Acting)**

DATE SIGNED: MM **11** DD **17** YY **78**

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

MM DD YY

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II. SUB-PROJECT DESCRIPTION

A. General

The purpose of this sub-project is to develop extendable packages of dryland farming technology through adaptive research and field trials designed to tailor known semi-arid agriculture technology to the small farmer environment of Central Tunisia.

The rationale for area selection is presented in the Project Paper. In this area, the vast majority (at least 30,000 of a total of 40,000 households) of farm families are dependent upon a mixed system of dryland farming which yield a bare subsistence output and annual per capita incomes in the \$40 to \$100 range. Constraints on the resource endowments of these farms (water and soil) are factors in limiting the potential output of the farms, but an important additional factor is the absence of an adapted and proven semi-arid agricultural technology to extend to the farmers of the region. This sub-project is a first step in responding to this problem. It proposes to support adaptive field testing of existing semi-arid technology (varieties and procedures already proven internationally) under small farmer conditions. The program of adaptive research will be specifically designed to address the production environment of the Central Tunisia small farmer (including little cash to invest in ancillary inputs, limited choice among tillage options, etc.).* The sub-project is designed to lead to an extendable range of semi-arid technologies and an understanding of the range of potential farm systems available to the dryland farmer of Central Tunisia. It does not directly address the diffusion of this technology. This will be addressed in later CTRD programming when we are confident that there is (or is about to be) an extendable package, and when the reconfiguration of extension resources under the Central Tunisia Development Authority is completed. The essential end-of-project status, therefore, is the existence of a range of field-proven varieties and practices suitable for extension to the small farmers of the region.

* The instrument chosen to implement this process of adaptive field testing is the Cereals Research and Training Institute at Le Kef. The role of the Institute is discussed on p. 16.

Recognizing that any type of research program is long-term, it has been concluded that the situation is favorable for putting in place a functioning and productive research capability to deal with major crop production problems. Applied and adaptive research techniques will be employed. Although funding will be scheduled over a three-year period, U.S. technical assistance will be spread over five years. At that time, the program should have adequate momentum for continuity and permanency.

B. Technical Interventions

Increasing dryland forage and cereal production in the sub-project area will be approached by developing complete packages of practices adapted to the climatic and soil zones of the region and to the opportunities and attitudes of its small farmers, with attention to risk-taking behavior. This will involve a continuing field research program in the area on the following items:

1. Cereal breeding (barley and wheat) and later legumes and forage directed toward adapted varieties for dryland conditions;
2. Continued variety testing of current materials throughout the region;
3. Soil fertility and fertilizer trials;
4. Agronomic trials (date and rate of seeding, seeding methods, weed control, crop rotations, etc.);
5. Soil management and moisture conservation trials (tillage techniques, fallow-crop rotations, seedbed preparation, erosion control).

In all cases, the adaptive research/field trials will be specifically designed around the real operating situation of the Central Tunisia small farmer. The trials will not be designed to establish "experiment station maxima" which can never even be approached by the small farmer because he could never make the capital and technical inputs of the

experiment station. Rather, the experiments will be designed to establish optimum practices at varying constraint levels. For example, control over seeding depth is a variable which is costly to manipulate towards uniformity. The adaptive research will be oriented to identifying varieties which produce good yield under conditions of substantial variation of seeding depth. Another example, many farmers in the region simply do not own lightly sloping fields with deep well drained soils. They have to cultivate on relatively steeper slopes and in secondary soils. Again, these conditions will be incorporated into the adaptive research and field testing.

None of the trials will be done at an experiment station. All of them will be done in farmer's fields. The research elements will be done under highly controlled conditions on farmer's fields and the second level of field trials will be done under actual small farmer conditions in their own fields. Sites will be chosen to handle the range of variability in soils, rainfall, altitude, etc., necessary to encompass the variation within the region. Sites will not be selected on a "progressive farmer" or other upwardly biased basis. Funds set aside in the project for full reimbursement of input costs for farmers cooperating in the experiments will not only make the inclusion of small, poorer farmers feasible, it may actually increase their interest in being full participants in the research as a way of hedging investment costs.

The trials will help to determine the actual yield potential of the dryland cereal zones. Additional work will be required to adapt these practices to the individual small farmer of the region. Many other constraints may affect the farmers' decisions to adopt new technology, especially the very small farmers. The availability of credit, improved seeds, fertilizers, herbicides, machinery, prices and marketing opportunities will all have an effect on the farmers' decisions to adopt new technology. The key is to make the technology available with suitable alternatives so he can make a rational decision. The new technology must have been demonstrated to him in his region before a decision to adopt the new practices will be made.

C. Farming Systems: Planning and Development

(Pilot study and demonstration area)

Only when new technologies and interventions are combined and coordinated into a complete system of farming, which suits the resources and needs of the farmer and his family, can the full potential of the new improvements be realized.

The purpose of each pilot study/demonstration area will be to assist farm families in a selected location in planning new systems of farming best suited to their own resources and needs. Since each farm and family unit is unique in some way, the system of farming will be planned and developed individually with each farmer in the study area. Most of the individual technologies or "packages" of them essential for a particular intervention, such as barley or wheat production and the procedure for farm planning, will be completely new to the farmers involved. Therefore, well-trained extension workers will need to be available to work closely with the individual farmers in planning and selecting most suitable farm plans and in developing them, step-by-step, over a period of years.

Actual selection of sites for an initial study (of a total of 8) area will be made by the research staff at Le Kef and the Central Tunisia Development Authority (CTDA) in cooperation with local authorities, the farm families involved, and local leaders. Dryland areas in either Djilma or Jedliane seem to merit first consideration, using criteria like the following:

1. Select an area large enough for 15 to 20 complete farm family units, each consisting of 30 or more hectares of land suitable for crop production and improved pasture;
2. To the extent possible, choose land with long, regular slopes, 2 percent to 6 percent grade, to allow for construction and farm units somewhat as illustrated in the Missouri feasibility study.

3. Try to locate an area typical of large areas of dryland in the different delegations to provide applicable patterns for future expansion.

One site will be selected in each of the eight delegations over the life of the sub-project.

Details of organizing the work and development of the pilot study/demonstration area (subsequently referred to as the sub-project area or the area) selected will vary somewhat with the location and the nature of the resources and families involved. Two factors will be given uppermost consideration -- the necessity for an interdisciplinary approach and for involvement of the local people from the beginning.

The implementing interdisciplinary group will include members of the extension and other technical services of the CTDA, the applied research staff (Le Kef Institute), and expertise available from other related institutes and agencies. One CTDA extension specialist, with farm management training and experience, will be assigned to work full-time with the Le Kef Institute in the area for work later described. A short-term consultant, with experience in farm planning and management work, will be provided to work with the group during the initial planning work and later as the program is implemented.

D. U.S. Inputs -- (See Annex B, Draft RFP)

The U.S. inputs into the sub-project will center on contract services procured from a U.S. land grant institution. These services will include a resident advisor to the Le Kef Institute for the duration of the research sub-project, short-term technical services (detailed below) and short-term training with emphasis on training at the International Agricultural Centers working on semi-arid applied agricultural research (ICARDA, ICRISAT, CIMMYT, etc.), but also including short-term applied training in the U.S. with appropriate agricultural agencies. The sub-project will not provide for any academic training or other long-term training.

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The objective of the sub-project is to rapidly develop a Central Tunisia adapted set of dryland farming technologies drawing upon existing proven varieties and technology. This end does not warrant long-term investment in overall staff development at Le Kef. The existing Agricultural Technology Transfer Project (No. 0304) does address the long-term Le Kef staff needs in the context of strengthening overall national research capacity in Tunisia. Key U.S. inputs are summarized below:

<u>U.S. INPUTS (\$000)</u>	<u>FY 79</u>	<u>FY 80</u>	<u>FY 81</u>	<u>TOTAL</u>
Commodities (equipment for adaptive field testing/mobile lab equipment & 2 US made diesel VW sedans)	570	200		770
Contract Services	330	400	320	1,050
Resident Advisor - 36 PM	(150)	(150)		(300)
Short-term consultants - 54 PM	130	(200)	(270)	(630)
Short-term U.S./Third Country Training	(50)	(50)		(100)
Grants to cover costs of adaptive testing in the farmers' fields of both varieties and total dryland systems	100	180	700	980

The long-term resident research advisor would be an experienced dryland agricultural researcher with proven experience in applied adaptive research and a capacity to manage the overall activity in light of the goal of producing technology adapted to and usable by the Central Tunisia small farmer. He should be at the Associate Professor level at the contracting university and required to speak French at the 3-level and read at the 4-level. A probable mix of short-term consultants is suggested below on the basis of advice received from an experienced international barley breeder consultant to the USAID. It is assumed that the

* Note that funding is tracked over three years in line with present country funding guidance. Mission believes that life-of-project funding is preferable to the extent possible. 100% funding in the first year would not only be managerially feasible, it would be operationally preferable.

contractor will have discretion in redefining the mix on the basis of on-the-ground experience. The extension training specialist suggested is foreseen not to actually carry out the diffusion process, but to work with extension officials and the Le Kef researchers on "packaging" the technologies which the adaptive research sub-project develops so that a follow-on extension effort can pick up this material in an extendable form.

<u>Discipline</u>	<u>Man Months</u>
Crop Production (Agronomist - Dryland)	10
Soil Fertility (Laboratory Specialist)	10
Farm Machinery/Experiment Station Management	10
Farm Management Economist	6
Weed Control Specialist	4
Erosion Control and Conservation Specialist	4
Extension Training Specialist	6
Agr. Economist - Risk Analyst	2
Rural Sociologist (Near East Agr. experience)	2

The Agr. Risk Analyst and Rural Sociologist will carry out an initial assessment mission in conjunction with the resident advisor and such agricultural production staff as appropriate to develop the details of the actual small farmer constraints around which the research/field testing will be designed.

E. Expected Outputs (See Logical Framework - Annex A)

The first year of the approved program will be needed for acquiring the necessary equipment, supplies, and initial personnel training. At the end of the second year, initial data from carefully located field trials should become available to serve as a guide for the next year's testing of more complete production systems. By the end of the third year, information, trained personnel, improved seeds and other supplies, and financing should be available for launching a widespread demonstration program in most of the sectors of the 8 delegations.

In summary, the purpose of the first three-year intervention is to build a sound foundation for a permanent improvement program.

As indicated above, most of this three-year intervention will be a series of essential steps to develop a program to provide appropriate technology for this particular region. Increases in physical output -- in terms of quintals of wheat and barley for individual farmers and for the project area -- are expected to be insignificant in this early phase.

However, the benefits from this work, if well done, should really unfold and could be significant to the project area economy during a second five-year period (See Economic Feasibility).

F. Issues

1. Although the PID highlighted barley research activities and the examples of potential benefits use barley as an illustration, the sub-project research will include wheat varieties as well as legumes and forage. Initial concentration on barley research reflects: varietal availability, i.e., several varieties exist and are ready for field testing; agro-climatic conditions which favor barley production; the extensive area in the region (relative to areas outside of the Central Tunisia region) presently sown to barley; and the fact that research on alternative wheat varieties has not been conducted in the area.

It is expected that over the life of the sub-project several packages of cropping systems will be tested, including cropping rotations with alternative varieties of wheat, barley, legumes, and forages.

III. SUB-PROJECT SPECIFIC ANALYSIS

A. Economic Feasibility

The economic feasibility of this sub-project will depend on:

1. Success in developing new technology packages which are adaptive to the needs and capability of small farmers in Central Tunisia, and

2. The effectiveness of the CTDA extension staff in diffusing the results of the applied research to small farmers. While CTDA extension agents will receive training at the Le Kef Institute and participate in adaptive research trials and in the pilot demonstrations, the actual extension of the results to a large number of farmers in the CTRD project area will take place after the successful completion of the applied research funded under this sub-project. However, the benefits which are forecast from adoption of improved practices by individual small farmers can be roughly estimated, as shown below:

-- Increase in Barley Yields and Production.
Dryland barley yields on individual farms may be expected to increase as much as 400 percent -- from 2 QX/ha. to 8 QX./ha. (on well-managed farms, the increase might be even more spectacular). For the area as a whole, however, an average increase of 100 percent (from 2-4 QX./ha.) may be a more reasonable estimate since only 15-25 percent of the farmers might adopt the new production system within this time frame.

Total barley production -- with the 2 QX/ha. increases in yield and 55,000 ha. planted as estimated for the area in 1977 -- would double, an increase from 110,000 QX to 220,000 QX. The value of the added production of TD 4,000 QX would amount to an additional TD 440,000 income for the project area.

From a national view point, this added production -- which could expand over time in both hectarage planted and yields -- would provide an in-country source of high-energy concentrate feed to support the expanding livestock industry, and thereby reduce the dependence upon imported grain feeds. This contribution might be doubled if one-half of the 1977 wheat hectarage (amounting to 57,000 ha.) were shifted to barley production. This kind of shift is often recommended since the dryland conditions seem better suited for barley production.

-- Increases in Wheat Yields and Production. Application of the proposed intervention is expected to increase wheat yields about the same as those for barley, percentage-wise. The increase in total production per hectare also would be similar since the starting yields are about the same. The change in total production for the area would depend upon shifts in planted hectarage between barley and wheat, as earlier illustrated.

-- Effect on Individual Farm Units. Increases in production of wheat and/or barley resulting from adopting improved production systems on individual farms would be more impressive on a relative basis.

Using barley as an example and assuming a dryland farming system with 10 ha. of barley per year, the average increase of 2 QX/ha. in yield would provide an additional 20 QX of barley produced. At TD 4,000 per QX, this would add TD 80,000 to the family gross income. The good manager who achieves a five-fold increase in yield (from 2-10 QX per ha.) would produce an additional 80 QX, with an added gross income of TD 320.

B. Social Soundness Analysis

(See relevant Section in Project Paper)

C. Technical Feasibility

The following technical analysis is based primarily upon studies and assessments of a University of Missouri-Columbia team in reports of April 1978 and July 1978, other relevant CTRD documents on file in USAID/Tunis and AID/W, and the Dryland Farming Systems PID.

1. Potential for Increase in Cereal Production

About 130,000 ha. of cereals are grown in the 8 delegations of the project area. This includes about 80,000 ha. of durum wheat, 10,000 of bread wheat and 40,000 ha. of barley. The area seeded to cereals varies greatly from season to season depending upon the rainfall conditions. Yield levels in all three types of cereals are very low, ranging from 50-150 kg/ha. in Thala, Jedliane, Rohia, Maktar and Djilma delegations. Even though rainfall amounts are relatively low and highly variable from season to season, these yield levels are extremely low in relation to the potential yield possible under these conditions. Under comparable climatic conditions in Turkey, for example, the average yield of barley ranges from 1,200-2,000 hg/ha. In the Pacific Northwest of the United States under similar rainfall conditions, the yield level of barley ranges from 2,500-3,500 kg/ha.

The present cultural methods of producing cereals in the project area can best be described as "opportunity" cropping. The farmers of the region apparently decide to plant or not to plant depending upon the rainfall situation during October to December each year. If the rains come early and in sufficient amounts, they will seed their cereal crops. As the season progresses toward December without adequate rains, more and more farmers decide not to plant. The land is then used for year-round grazing for animals. This "method" of cropping accounts for the wide fluctuations in the area planted to cereals from one year to the next. This system also allows heavy weed growth to occur which extracts most of the moisture out of the soil profile, leaving the crop entirely dependent on timely rains during

the crop growth period. The most common method of tillage and seeding is to ground-broadcast seeds over the soil surface and then plow or disk to cover the seeds with a layer of soil. This leaves a very rough, cloddy seedbed with seeds buried to several depths and a considerable amount left exposed on the soil surface. The result is a thin, poor stand of seedlings which is not capable to competing with weeds for the meager moisture and soil nutrients that are available.

Even though the rainfall is relatively low and erratic in this region and the soils shallow in parts of the area, it appears that the potential yield on the average is at least 4-5 times greater than is presently being achieved. The seasonal fluctuations in yield are generally large even under good management, but the actual yield levels are considerably greater than presently achieved in the sub-project area. The potential yield of cereals in a given area is dependent on the amount and distribution of rainfall, temperature, and soil resources (depth, type, fertility). The actual yield achieved in a given area is determined by how well one manages the crop in relation to the climatic and soil conditions, the more critical good management techniques become.

Essentially, no cereal production field research is available in the sub-project area. Most field trials conducted by the Office of Cereals and other research groups are in the higher rainfall zones of the north. Little or no effort has been exerted to-date to develop cereal varieties (barley or wheat) for the drier zones of Tunisia. As far as is known, there are no field trial results in the sub-project zone on varieties, fertilizers, planting dates and rates or soil management techniques. Without these kinds of data, it is almost impossible to mount an effective extension effort to increase the yield level of cereals. This information must be developed in the sub-project area and then production systems and extension activities can be devised that are feasible and acceptable to the farmers in the region.

The first five years of the proposed intervention is mostly preparatory in nature. However, the benefits from this preparatory work, if well done, should really unfold during a second five-year period after completion of life of the sub-project. Increases in physical output -- in terms of quintals of wheat and barley, for individual farmers and for the sub-project area -- are expected to be significant.

2. New Technologies to be Introduced

To improve the production of cereals (barley and wheat), the following practices must be developed and introduced in the sub-project area:

- a. Cereal variety testing and breeding;
- b. Improved cultural practices;
- c. Improved fertilizer use;
- d. Improved weed control (during both crop and non-crop period); and
- e. Improved soil management and moisture conservation practices.

-- Cereals Variety Testing and Breeding. The testing, selection, increase, and distribution of better adapted barley and durum wheat varieties suitable for the dryland areas is perhaps the most immediate way to have an impact on production in the sub-project area. It should be emphasized that introduction of new varieties alone will not solve the problem of low productivity under dryland conditions. It does, however, offer an avenue to introduce new technology. Introduction of a well-adapted variety should give at least a slight increase in yields but perhaps not as great as expected. One should be careful about "overselling" the importance of a new variety so as to avoid disappointment if substantial increases are not achieved. In a good dryland production system, a well-adapted, productive variety is an essential ingredient, but must be combined with other elements of the package to give the desired increase. Perhaps the current

varieties and lines do not include any types that are adapted for dryland conditions. In this case, immediate steps will be taken to obtain types from outside sources for testing in the sub-project area. Cereal variety trials will be conducted in every delegation where climatic and soil conditions are different. A strong barley and wheat breeding program will be encouraged and should be well-supported in order to supply to the farmers the best possible variety for their conditions.

-- Improved Cultural Practices. Thin, weak stands appear to be one of the main factors responsible for the low yields in the area. This can be overcome by better seeding methods, e.g., drill seeding instead of broadcast seeding. Other cultural practices that need attention are:

- rate of seeding (drill seeding should require less seeds/ha.,)and
- date of seeding (better seedbed preparation may allow earlier seeding).

Variety tests also must be conducted under "poor management" conditions.

-- Improved Fertilizer Use. Little or no fertilizer appears to be used in the sub-project area on cereals. The nature of the climate and soils suggests nutrient deficiencies in the cereal crop, especially for phosphates. A series of simple phosphate and nitrogen treatments will be established to determine the response to fertilizer application. The phosphate fertilizers can be drilled with the seed at planting, but nitrogen should be applied separately to avoid damage to emerging seedlings. If there are indeed nutrient deficiencies in the cereal crops of a serious nature, the introduction of other practices such as new varieties, better seedbed preparation, and better seeding methods may have little effect. The identification of the major limiting factors on yield is the key to developing a productive cropping system.

-- Improved Weed Control. Under dryland conditions, it is generally assumed that any moisture or nutrients used by weeds reduces the yield of the crop by a proportionate amount. Whatever is removed by weeds must be replaced in order to be available to the crop. It is particularly critical that weeds be eliminated in the early stages of crop growth.

The first priority in weed control research is to identify the magnitude of the weed problem, the species present, and the probable losses due to weeds. Each researcher working on the dryland cereal production system will be aware of the potential weed problem and report to the person responsible for carrying out weed control measures. Weeds are important in both the crop and the non-crop (fallow) periods. The present use of arid cereal lands for heavy livestock grazing on the aftermath and weed growth during the non-crop (fallow) period is undoubtedly having an effect on the possible moisture storage in the soil profile which could be used later on by the cereal crop during the cropping period. Control of weeds in the fallow period is discussed in the following section.

-- Improved Soil Management and Moisture Conservation. In many areas of the world where cereals are produced under dryland conditions such as in Central Tunisia, a two-year fallow-crop rotation is used. This system involves storing moisture in the soil profile during the first year after harvest which is then used by the crop during the second year along with the rainfall received during the cropping period. The conditions in Central Tunisia appear conducive to the fallow-crop system and should be investigated as a possible cropping system.

In a fallow-crop system, the cereal lands can be used for grazing for a portion of the fallow period, but should be kept weed-free during the late spring, summer and early fall prior to planting. A series of preliminary trials will be conducted comparing the annual and fallow-crop rotation (biennial) system to determine the system best suited for the area.

Soil management research also will be conducted on time of tillage, tillage implements, soil moisture storage, and weed control. Research and training in dryland agronomy is limited to only a few areas of the world. Most of the basic studies in this area have been developed at a few universities in the western United States and in several universities in Australia.

D. Administrative Feasibility

1. Role of the Le Kef Institute

Since the GOI has established several new research-and training Institutes. The Cereals Research and Training institute at Le Kef has been identified as the institution most likely to serve the sub-project area with a sound applied field research program when adequately equipped and staffed (See pp. 65-67 of University of Missouri Report entitled "Agricultural Development in Central Tunisia"). The present Director of the Institute is confident that the opportunity to carry out field research with adequate equipment will attract professionally competent and dedicated Tunisian personnel. Their skills will be sharpened through short-term participant training in the U.S. or third countries, and on-the-job training to be provided through a contract with a U.S. university experienced in dryland farming research. A long-term resident advisor at Le Kef will be responsible for planning the training program, for coordinating the visits of short-term consultants (e.g., to train Institute personnel in operating the research equipment) and for insuring that the research program remains on track and that adequate coordination is maintained between the Institute and the CTDA.

While the Institute will carry out the applied research program for Central Tunisia under a contractual arrangement with the CTDA, it will continue to maintain research links with the National Agricultural Research Institute (INRAT) and other institutions operating under the supervision of the Ministry of Agriculture's Research, Training and Extension Bureau (DERV).

2. Role of the CTDA

As the agency responsible for the overall development of the CTRD project area, the CTDA will monitor the applied research conducted by the Le Kef Institute and insure that it is relevant to the needs of small farmers in Central Tunisia. (See evaluation section of Project Paper). Furthermore, the agricultural extension staff of CTDA will be responsible for disseminating among the small farmers of the sub-project area the "technology packages" developed by the Le Kef Institute for Central Tunisia. Thus, the "pay-off" of the applied research will depend to a large extent on the effectiveness of the CTDA extension staff. However, while the extension capability of the CTDA is a matter of concern to the CTRD project (see Project Paper), it is not addressed by this sub-project.

Nevertheless, the sub-project does provide for on-the-job technical training of CTDA extension staff as a by-product of the applied research process. Thus, the CTDA will be requested to assign agricultural extension staff personnel to work side-by-side with personnel of the Institute engaged in conducting field trials in the sub-project area. CTDA extension agents stationed in the vicinity of these trials will assist the research specialists in conducting field research so that they may become more proficient and confident in their efforts to extend the results to farmers. When appropriate, the CTDA extension agents will be expected to introduce to small farmers of the area individual practices identified during field trials as conducive to substantial yield increases. CTDA extension specialists with farm management training and experience also will be assigned to work full-time with the research specialist in the study/demonstration areas established in each delegation of the sub-project area.

The CTDA staff will be responsible for maintaining close working relationships with each delegation's officials and with the secteur and farm leadership within the area and for keeping farmers in the sub-project area fully informed

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about all the stages of development of the applied research program. The CTD will also make necessary arrangements with the applied research and technical staff at Le Haf for essential technical training and of specialists and their assistants assigned to the area.

3. Role of the Peace Corps

U.S. Peace Corps officials in Tunisia are particularly interested in supporting the sub-project. The development of study demonstration farm units within the pilot study area will require on-going supervision and assistance of a specific and detailed nature. USAID and the Central Tunisia Development Authority will explore with the Peace Corps and U.S. medico officials the possibility of assigning one or two volunteers to work with the CTD extension specialist in each pilot study area.

4. Environmental Analysis

(See Environmental Analysis in Project Paper.)

IV. FINANCIAL ANALYSIS AND PLAN

The following table summarizes USAID and COT financed inputs to this sub-projects. While funding is phased over these years, contract services will extend over the five year life of the project.*

The commodities shown as funded in FY 1970 and FY 1971 constitute the bulk of the research equipment required for the implementation of the sub-project (as detailed in appendix Tables 1-3, 1-5 and 1-4 of the University of Missouri report on Agricultural Development in Central Tunisia). If additional funding (over and above the FY 1970-71) becomes available, USAID would prefer to fund all that equipment in FY 1970 so that it can be ordered as soon as possible following project approval and delivered before the beginning of the agricultural season in the Fall of 1970. Specifications for follow-on equipment, as required, will be prepared by the technical assistance contractor, and \$50,000 has been included in the contract for that purpose.

An amount of \$40,000 has been budgeted to reimburse cooperating farmers for on-farm experimental costs incurred in the course of field trials and pilot demonstrations. It is expected that reimbursement will be made by the CTD directly to suppliers of farm production inputs upon certification by the Le Haf Institute and the resident contract advisor that these inputs were used for the applied research program.

* Phased funding reflects current guidance on country funding levels. Mission would prefer life-of-project funding.

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Funds for that purpose would be advanced by UNCTAD to the UNCTAD on the basis of an estimate of needs for a six-month period. No less than every six months, the UNCTAD would provide UNCTAD/Tunisia a report of expenditures with a statement signed by the UNCTAD director certifying that funds were expended for the purposes outlined in the project agreement. Although UNCTAD will reserve audit rights in the project agreement relating to the reimbursement of on-farm experimental costs, UNCTAD/Tunisia will undertake no independent verification of the accuracy of the original document substantiating these expenditures before reimbursing UNCTAD. UNCTAD/Tunisia has followed these procedures in the case of the Siliana Rural Development project and is satisfied with the fiscal procedures followed by the UNCTAD.

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PROPOSED FINANCIAL PLAN (DISBURSEMENTS) (000 U.S. DOLLARS)

	<u>FY 79</u>	<u>FY 80</u>	<u>FY 81</u>	<u>TOTAL</u>
<u>U.S. COMPONENT</u>	<u>1,000</u>	<u>780</u>	<u>1,020</u>	<u>2,800</u>
<u>Local Currency Financing</u> ^{1/}	<u>100</u>	<u>180</u>	<u>700</u>	<u>980</u>
<u>Commodities</u>	<u>570</u>	<u>200</u>	-	<u>770</u>
<u>Contract Services</u>	<u>330</u>	<u>400</u>	<u>320</u>	<u>1,050</u>
Resident Agronomist - 36 PM	150	150	-	300
ST Consultants - 54 PM	130	200	270	600
ST Participants - 43 PM	50	50	-	100
Contractor Commodities	-	-	50	50
<u>GOT COMPONENT</u>	<u>1,540</u>	<u>500</u>	<u>600</u>	<u>2,640</u>
<u>Drylands Crop Institute---</u> <u> Le Kef</u>	<u>1,540</u>	<u>500</u>	<u>600</u>	<u>2,640</u>
Land and Buildings	1,000	-	-	1,000
Equipment and Furnishings	100	-	-	100
Personnel and Operations	440	500	600	1,540
<u> TOTAL PROJECT</u>	<u>2,540</u>	<u>1,280</u>	<u>1,620</u>	<u>5,440</u>

1/ Production inputs to be provided to sub-project cooperating farmers for field trials.

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V. IMPLEMENTATION PLAN

A. U.S. Monitoring responsibility

(See Implementation Plan in Project Paper.)

B. GOT Monitoring responsibility

(See Implementation Plan in Project Paper.)

C. Implementation responsibility

Under the direction of the IIT, the Le Nef Institute will implement the applied research program to be funded under this sub-project. The IIT will negotiate a (host country) contract with a U.S. university experienced in semi-arid dryland agriculture (and, particularly in barley research) which will be responsible for advisory services and participants training. This contractor will also provide the technical assistance services in small farmer irrigation. The selection of the contractor and the negotiation of the contract will, to the greatest practicable extent, follow normal IIT contracting procedures.

The Institute will be responsible for all operating costs of the research program, including salaries of Tunisian research staff and maintenance of the research staff and maintenance of the research facilities and equipment. These operating and maintenance expenses will be financed from the Institute's annual budget which will be increased to accommodate the new research function of the Institute.

IIT/US will be responsible for procurement of the research equipment described in Annex A, Tables 1-2, 1-3, and 1-4 of the University of Missouri Report, on the basis of a P.I.C. prepared by UNED/Tunisia.

In Paragraph 5.2 of IIT 24-507, IIT/US has raised the possibility of funding short-term participant training and equipment inputs under another project, the Agricultural Technology Transfer (ATT) Project. This option has been rejected by the Mission for the following reasons:

1. While it includes limited procurement of soil-testing equipment to support nation-wide thesis research needs, ATT is basically an academic participant training project and, therefore, is not a suitable vehicle for procurement of specialized applied research equipment.

2. It is essential that short-term training be closely integrated with on-the-job training which will be the responsibility

of the institution providing advisory services;

3. It is anticipated that all, or most of, the short-term participant training will be carried out at applied agricultural research stations, in many instances outside the U.S. It cannot be argued, therefore, that short-term training should be linked to long-term academic training which will be conducted at U.S. universities.

D. Logistical Support

(See Implementation Plan in Project Paper).

E. Implementation Schedule

(See Project Paper).

VI. EVALUATION PLAN

(See Project Paper).

VII. CONDITIONS, COVENANTS, AND NEGCTIATING STATUS

(See also the Conditions and Covenants Section of the Project Paper).

Conditions Precedent

A. General

Before any disbursement can be made under this sub-project, an agreement must be signed between the CTDA and the Le Kef Institute setting forth the responsibilities of each party with regard to the implementation of this sub-project, including the Institute's responsibility to carry out the adaptive research program in the project area and provide technical training for CTDA extension personnel and the CTDA's responsibility for assigning extension personnel to work with research personnel.

B. Technical Services

Before any disbursement can be made for technical services, a contract acceptable to A.I.D. must be signed between the GOT and a U.S. land/grant institution for the provision of such services.

C. Disbursement of Funds for On-Farm Experimental Costs

Before funds can be advanced or reimbursement can be made to CTDA for on-farm experimental costs incurred in the course of implementing this sub-project, the following conditions must be met:

1. The resident advisor under the technical assistance contract must be in place at Le Kef.

2. Acceptable procedures for advances of funds and reimbursement of on-farm experimental costs must be developed.

3. No less than 8 CTDA extension agents (one per Delegation) must be assigned to work full-time with the Institute's research staff in the project area.

Dryland Research Log Frame

ANNEX A

PURPOSE	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
<p>Development and adaptation of tested systems of dryland farming practices and inputs useable by and extendable to the small farmers of the Central Tunisia Rural Development zone</p>	<p>1. Defined production environment(s) for small farmers in Central Tunisia</p> <p>2. Development of field-tested dryland farming practices adapted to specific agro-climatic sub-zones of Central Tunisia</p> <p>3. Cereal, legume, and forage crops tested and field-adapted within the context of extendable dryland farming practices</p> <p>4. Packages of farming practices designed for rapid transfer to CTDA-operated extension system</p> <p>5. Minimum cadre of CTDA extension staff fully trained in content of packages relevant to their delegations</p> <p>6. Results observable among limited number of beneficiaries</p>	<p>- Minimum of 4 defined</p> <p>- Minimum of 4 such practices</p> <p>- Measurable number of varieties tested and agronomic/cultural practices applied</p> <p>- Minimum of 4 such packages defined</p> <p>- CTDA personnel in each of 8 delegations</p> <p>- 160 pilot demonstration participants</p>	<p>1. There are definable production environments of varying kinds within Central Tunisia - applicable to local ecological differences.</p> <p>2. The agro-climatic dryland farming zones of the 8 delegations within the AFD-project areas are different from each other; but similar in some classes of conditions, thus enabling them to be grouped.</p> <p>3. Some varieties of cereals, legumes, and forage crops will be quickly adopted by some enterprising CTDA area small farmers.</p> <p>4. Most CTDA area small farmers will have to be convinced in practice and with reference to their local conditions that adapted varieties and farm practices yield reliable and therefore not too risky opportunities for investment and change in methods.</p>

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PURPOSE	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
			!5. Le Kef will seriously !push it's staff in the !concept of testing and !adaptation only in !field situated !conditions.

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OUTPUTS	EOFS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
1. Cereal, legume, and forage variety recommendations based on field tests developed for sub-zones of CTRD area.	a. Barley variety recommendations - 6 b. Wheat variety recommendations - 12 c. Forage and legume crop recommendations - 4 d. Delegation extension personnel participating in all components of field tests among delegations - 8	- CTDA Information systems - Records of tests - Le Kef Institute records on reimbursable research with farmers - Staff assignments and work plans of CTDA staff	11. Adaptable cereal, legume, and forage varieties exist which can be adapted to Central Tunisia and provide increased returns. 12. Farmers in Central Tunisia, when confronted with examples of varieties and practices which yield increased incomes and more reliable results, will utilize same.
2. Agronomic and cultural practice recommendations for cereal, legume and forage crops developed for sub-regions of CTRD.	- Optimum small farmer agronomic packages tested among delegations - 8	- Completed draft Handbooks and Manuals	13. Some enterprising farmers in Central Tunisia will be willing to cooperate with research personnel in carrying out test activities in their fields.
3. Completed pilot demonstrations of total dryland farming systems	a. Demonstrations - 8 b. Participating farmers - 160		14. Two full growing seasons, October 1980 and October 1981 will be sufficient to yield some useful results about farming practices if not adapted varieties.
4. Variety, agronomic, and farming systems information organized and tested as a means of transferring knowledge through CTDA extension system	a. Delegation extension chief draft handbooks developed - 8 b. Specialized, area-specific draft extension manuals developed - 4		15. Research efforts started in 1979 through CTDA and the contractor will continue over some meaningful period of time - such as five years

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OUTPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
j. Institutional research to extension linkages established.	c. Draft handbook for farm budget and systems mgmt. - 1	- CTDA information systems	!6. Existing Le Kef staff with some additions to be provided by that institutions, will be sufficient to carry on extensive field testing in an effective manner.
. Le Kef Institute experienced in new research model emphasizing 100% of content of research in farmers' fields	- CTDA extension personnel directly involved in applied field research on a sustained basis - 27	- Special studies	!17. CTDA will continue to take a growing interest in the problems associated with extension of proven research results among dryland farmers.
	a. Senior academic research staff - 5	- Le Kef staff assignments	!8. An effective U.S. contractor will provide the high-quality, resident French-speaking technical advice at Le Kef and in the field tests.
	b. Field research staff - 20		!9. Systems of measuring farmer interest in research results can be developed by the CTDA.
			!10. Le Kef Institute personnel assigned to this activity will be sufficient mobile.

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INPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
<u>1. U.S.</u>			
a. Equipment:	\$820,000	Pro-Ags	!1. Host country contracting and fielding of an effective American contractor can be completed rather quickly.
-Mobile field labs for variety trials - 2		Procurement Orders	
-Mobile field labs for agronomic trials - 2		CTDA records	
-Ancillary lab testing equipment		CTDA information systems	!2. Procurement of essential field testing labs and related equipment can be initiated by AID as soon as conditions precedent are met.
-Motor vehicles -2		Le Kef Institute records	
b. Technical Assistance:	\$1,000,000		
-Resident Research Advisor 36 P/M			!3. Effective management and training relationships can be worked out between CTDA, Le Kef Institute, and the contractor.
-Short-term consultants 54 P/M			
c. Short-term	\$100,000		!4. Short-term participant training will be confined, largely, to third countries now engaged in dryland crop and farming research.
Participant Trng Training 43 P/M			
d. Reimbursement of small-farmers for on-farm experimental costs	\$980,000		
Total:	<u>\$2,800,000</u>		
<u>2. G.O.T.</u>			
Le Kef Institute			
a. Land and buildings	\$1,000,000		!5. The proposed reimbursement arrangements for small farmers who participate in the field testing can be designed to work smoothly and quickly.
b. New equipment and furnishings for CTRD-related activities	100,000		!6. The CTDA will devote increasing management and policy-development attention to drylands research
c. Operational Budget	1,540,000		

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INPUTS	EOPS & MEASURES	MEANS OF VERIFICATION	ASSUMPTIONS
<u>2. GOT (Cont'd)</u>			
CTDA:		CTDA records	
a. Senior Extension Officers (B.S.) 9 P/Y	Salary and Allowances		7. CTDA will become interested in devoting additional funds and effort to drylands farming systems research in the Central Tunisia region.
b. Extension Assistants 18 P/Y	Salary and Allowances		
c. Minor Extension Field Staff 100 P/Y	Salary and Allowances		
	<hr/> Total: \$2,740,000		

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