

SUMMARY PART

47055

(BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS)

A. REPORTING A.I.D. UNIT
 (Mission or AID/W Office)
 664-3
 (ES)

B. WAS EVALUATION SCHEDULED IN CURRENT FY ANNUAL EVALUATION PLAN?
 yes slipped ad hoc

C. EVALUATION TYPE:
 interim final or post other

D. ACTIVITY OR ACTIVITIES EVALUATED (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report)

Project #	Project/Program Title (or title & date of evaluation report)	First PROGRAM equivalent (FY)	Most recent FY	Planned IOP Cost ('000)	Amount Obliga to Date ('000)
664-0312	Evaluation Report-Central Tunisia Rural Development Project (May, 86)	1979	09/30/1989	\$23.5 mil.	\$22.000

(Range Subproject only)

E. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

Action(s) Required

 Review evaluation recommendations and incorporate where appropriate into subproject activities.

Name of officer responsible for Action

ARD

Date Action to be Completed

Oct, 1986

(Attachments, if necessary)

F. DATE OF MISSION OR AID/W OFFICE REVIEW OF EVALUATION

on 9 day 26 year 86

G. APPROVALS OF EVALUATION SUMMARY AND ACTION DECISIONS:

Project/Program Officer, Representative of Borrower/Grantor

Evaluation Officer

Mission or AID/W Office Director

[Signatures]

The Central Tunisia Rural Development Project (CTRD - 664-0312) was established in 1979 to assist the recently organized Central Tunisia Development Authority (CTDA) to pursue its regional rural development mandate. The evaluation focussed on six of eight subprojects implemented to date under the umbrella project, in such substantive areas as dryland farming, small holder irrigation, rural potable water, rangeland development, extension and area development.

The evaluation examined the impact of the Project on Central Tunisia and on CTDA. The Project has contributed to regional development through principal production interventions related to (1) credit for privately owned shallow wells, (2) small irrigated public perimeters (PPIs) and (3) applied research and extension related to dryland farming. Rural potable water and community health are the two main non-production interventions. Technical assistance for institutional strengthening has been provided to CTDA through the Area Development Subproject, in the areas of regional planning, macro-social data gathering and analysis, and project management and planning.

The major findings and conclusions were:

-- This regional development effort has been successful and cost effective and should be continued by AID, both through subprojects to improve the quality of rural life and through interventions to increase agricultural production, especially improvement of the efficiency of small-holder irrigation and range management;

-- CTDA has identified and effectively provided important development services not heretofore adequately provided by existing line agencies of the GOT;

The recommendations include:

1) AID should continue its support of both non-agricultural activities (rural health and potable water) and of productive activities related to small holder surface well irrigation, support of cooperatives and private initiatives related to improved marketing of produce, and to optimum use of identified water supplies through improved management.

I. EVALUATION COSTS

1. Evaluation Team PIO/T No. 664-0312-2-30045 with RONCO Corporation

Name	Affiliation	Contract Number OR TIDY Person Days	Contract Cost OR TIDY Cost (D\$)	Source of Funds
Alice Morton	RONCO Corp.	35 days)	See above
Richard Newberg	//	36 days)	
Reginald King	//	35 days)	
Carole Ayad	//	32 days)	
Mondher Gargouri	Univ. of Tunis	26 days)	
Abdelkader Zghal	//	26 days)	
Mohamed Frioui	//	26 days)	

2. Mission/Office Professional
Staff Person-Days (estimate) 11

3. Borrower/Grantee Professional
Staff Person-Days (estimate) 63

2) AID should continue to work through CTDA. CTDA should continue in its present domain of responsibilities. The Ministry of Agriculture is the appropriate tutelage authority for CTDA; however CTDA should continue to work closely with the Ministry of Plan for non-agricultural activities.

While the evaluation team foresaw a regional assistance role for USAID in Central Tunisia, USAID's overall development strategy for Tunisia has been redirected since the evaluation team made its recommendations. Tunisia currently faces a grave balance of payments situation and consequently forms of assistance which yield immediate payoffs are more appropriate to GOT needs. As a result, USAID is restructuring its program away from projects with long-term payoffs, such as CTRD. Within available funding, USAID will examine components of the CTRD project to determine those aspects which may have relevance for inclusion under USAID's refocussed program.

A.I.D. EVALUATION SUMMARY PART II

J. SUMMARY OF EVALUATION FINDINGS, CONCLUSIONS AND RECOMMENDATIONS (Try not to exceed the 3 pages provided) Address the following items:

- o Name of mission or office
- o Purpose of activity (ies) evaluated
- o Purpose of the Evaluation and Methodology Used
- o Findings and Conclusions
- o Recommendations
- o Lessons learned

EVALUATION SUMMARY

USAID/Tunis

Evaluation Report, Central Tunisia Rural Development Project
(664-0312), by RONCO Consulting Corporation

PURPOSE OF ACTIVITY EVALUATED:

The evaluation report represents the findings, conclusions and recommendations of a joint GOT-AID team concerning the Central Tunisia Rural Development Project and its various subprojects. The project was designed with two major purposes:

- 1) To develop cost-effective and managerially efficient projects for Central Tunisia which could be replicated in other parts of Tunisia where conditions of similar marginality apply, and
- 2) To increase income, labor productivity and improve the quality of life of rural Tunisians living in the CTRD zone, thereby decreasing regional and intra-regional disparities in level of living.

The establishment of the Central Tunisia Development Authority (CTDA) was an important step in the GOT move toward decentralization as a means of addressing service delivery needs at local levels, as well as toward equalization of the quality of life in the peripheral areas with more urbanized areas. The CTDA was designed as an instrument for region-wide, multi-sectoral planning, implementation, monitoring, and evaluation.

The Project was authorized in 1979 to assist the recently organized CTDA to pursue its regional rural development mandate. CTDA was the first multi-sectoral, multi-gouvernorat, decentralized authority to be created in the otherwise highly decentralized Tunisian government. Since 1979, several AID-funded subprojects have been implemented by CTDA. Although virtually all USAID-funded, 664-0312 Project activities were examined, the evaluation team focused on six of eight subprojects:

- a) 664-0312.1 - Area Development
- b) 664-0312.2 - Dryland Farming Systems Research
- c) 664-0312.3 - Small Holder Irrigation
- d) 664-0312.7 - Rural Potable Water
- e) 664-0312.8 - Rangeland Development
- f) 664-0312.9 - Rural Extension and Outreach

The other two subprojects include a potable water (664-0312.4) activity which terminated in 1982 and a newly activated PVO subproject (664-0312.10).

Date this summary prepared:

SUMMARY

METHODOLOGY: The evaluation contractor fielded a large and senior team, including Dr. Richard Newberg who has extensive AID and Tunisia experience. The evaluation team was sub-divided into three teams, to cover institutional/organizational analysis, economic and agricultural/production analysis, and social impact analysis. The team spent three and one half weeks in the field in Central Tunisia, with some visits to key GOT ministries and other organizations in Tunis. An additional two weeks were spent in carrying out those interviews and in report preparation.

The evaluation involved the Ministry of Agriculture and several of its regional development agencies, including the Kef Agricultural Institute (ESAK), the Range and Livestock Office (OEP), the Regional Commission for Agricultural Development (CRDA) and the National Agricultural Institute (INAT), as well as the Central Tunisia Development Authority.

The team undertook an in depth evaluation of the four active subprojects for which CTDA is the primary implementing agency, and; to a lesser degree, evaluated the remaining two active subprojects for which CTDA shares implementation responsibility-- with ESAK (Research) and OEP (Rangeland).

A decision was made by the team that all 17 delegations of the current Project area should be visited by at least one representative of each sub-team. Two additional steps were taken. First, the institutional/organizational sub-team designed a questionnaire for each of CTDA's subdivision and division heads. Second, the economics sub-team designed a farm budget format for the subdivision heads to fill out for those farms which the team has visited. Other methodologies included document review and interviews of expert respondents. The team worked closely with the CTDA Planning and Evaluation Director, who was assigned to backstop the evaluation within the CTDA, as well as with his colleagues, and with the Tunisian and expatriate advisors.

Two debriefings were held with AID and the CTDA during the evaluation process and one meeting was held later at the USAID. CTDA and USAID reviewed each recommendation with the team, and some recommendations reflect, therefore, the combined suggestions of CTDA and USAID.

FINDINGS:

1) The Central Tunisia development effort supported by AID has been successful and cost effective both in terms of subprojects designed to improve the quality of rural life, and in setting into motion a process for increasing agricultural production, especially through small-holder irrigation and improvement in forage supplies for ruminant livestock;

2) CTDA has identified and effectively provided important development services not heretofore adequately provided by existing line agencies of the GOT;

3) CTDA has strong support both from regional and national political entities for continuing its activities under a broadened development mandate.

RECOMMENDATIONS:

1) AID should continue to give high priority to assistance and financing of selected economic and social development activities in Central Tunisia.

AID should support agricultural activities including:

- a) Small-holder surface well irrigation toward improved efficiency of water use from existing wells, including supplemental irrigation and other water-extending approaches and financing of some new wells;
- b) Support of cooperatives and other private agribusiness activities particularly in marketing of the increased supplies of fruit and vegetables and in provision of production inputs and services;
- c) Increased emphasis on efficient water management, whether on PPIs or from surface wells, particularly in terms of water delivery systems which reduce water losses and which key water application to plant consumption needs.

3) AID should support non-agricultural activities, including:

- a) Potable water;
- b) Health service development.

4) AID resources directed to Central Tunisia should be channeled principally through the CTDA, and

- a) The CTDA should continue to have responsibilities along present lines in its current area of responsibility;
- b) However, to conform CTDA's regional authority to the boundaries of the economic "region" of the Central West, the CTDA mandate should be broadened geographically to include the governorates of Sidi Bou Zid and Kairouan in terms of emphasis on new areas of non-agricultural activities such as development of potable water and health infrastructure, and;
- c) The CTDA would best continue under the tutelle of the Ministry of Agriculture with a strong liaison with the Ministry of Plan for non-agricultural activities.

The evaluation team noted the following lessons learned:

-- Where timing permits, institutional strengthening activities should be completed well before project implementation activities are undertaken, to allow a fledgling regional authority to work from an improved base.

-- Given the more favorable rate of return in shallow well irrigation programs, the GOT should place greater emphasis on this type of irrigation.

Central Tunisia Rural Development Evaluation Report,

RONCO Consulting Co., May, 1986

ATTACHMENTS

COMMENTS BY MISSION, AID/AI OFFICE AND DONOR/COUNTRY
COMMENTS BY MISSION AND GRANTEE:

The evaluation team complied with the terms of reference. The time allowed by the team for field work was adequate to cover the terms of reference and to obtain views of counterpart personnel as well as USAID. The methodology was appropriate for use in this evaluation and would be appropriate for replication in other agricultural or institutional development programs. Neither USAID nor the GOT noted biases on the part of evaluation team members. The Ministry of Agriculture and its regional development agencies have received the final evaluation report translated into French and had no major comments on its contents.

The evaluation was considered adequate by the Mission and its recommendations coincide generally with assessments by the GOT and the Mission. Particularly critical is that greater emphasis should be given to (a) water management, particularly water delivery and application systems which reduce water losses and (b) water application which is better keyed to plant consumption needs. This should be applied to both PPIs and surface wells. The recommendation that CTDA expand its area to include Sidi Bouzid and Kairouan for non-agricultural activities like potable water and health cannot be adopted by AID as part of its program. CTDA in its own planning may want to go in this direction. However, in summer, 1985, CTRD expanded its program into seven new delegations in south Central Tunisia and AID is working with CTDA in a well-targeted program to put projects there on solid footing. Furthermore with respect to health, AID is closing out its involvement in this domain except for activities in potable water, since AID has completed its health policy agenda.

Principle findings suggest that the CTDA's development effort supported by AID has been successful and cost effective and that objectives of 664-0312 can be achieved with no major changes through the life of the project. The report recognizes that institution building is a lengthy process but considers that the process is well on the way as a result of the CTRD project.

Since the evaluation was completed, however, the economic situation in Tunisia has changed radically. As a result of a rapidly deteriorating balance of payments situation, USAID has examined the possibilities for restructuring its economic assistance program to make it more responsive to short term GOT needs and to facilitate structural reforms. USAID's proposed strategy emphasizes programs with near-term impact as opposed to the current portfolio, which includes projects like CTRD which are essentially institution building in nature, with

MISSION COMMENTS ON FULL REPORT

largely medium or longer term payoffs. Within available funding, USAID will examine components of the CTRD project to determine those aspects which may have relevance for inclusion under USAID's refocused program.

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PD/MKarns *[Signature]*

ARD/JSmith:hk:09/18/86:Doc.0937R

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47056

EVALUATION
OF THE
CENTRAL TUNISIA DEVELOPMENT PROGRAM
IMPLEMENTED BY THE
OFFICE DE DEVELOPPEMENT DE LA TUNISIE CENTRALE
WITH DEVELOPMENT SUPPORT
PROVIDED UNDER
AID'S CENTRAL TUNISIA RURAL DEVELOPMENT PROJECT (644-0312)

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Date: May 1, 1986

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Work Order No. 3

PREFACE

This report presents the findings, conclusions and recommendations of a joint GOT-USAID evaluation team concerning the Central Tunisia Rural Development Project and its various subprojects. The evaluation team was divided into three teams, one for institutional/organizational analysis, one for economic and agricultural/production analysis and the third for social impact analysis. This was an internal team decision, in order to maximize effectiveness in carrying out an extensive scope of work (see Annex A).

The team spent three and one half weeks in the field in Central Tunisia, with some visits to key GOT ministries and other organizations in Tunis before, during and after that field stay. It was decided by the team that the institutional/organizational sub-team should also visit two other Offices de Mise en Valeur -- in Kairouan and in Sidi Bou Zid -- in order to obtain comparative data. Various individual members of the team also held separate, additional meetings with a number of GOT officials in the Ministries of Plan, Agriculture, Economy, with the Governor of Kairouan, with UNAT, and with other governmental and para-governmental organizations, including OEP and ESAK. An additional two weeks was spent in carrying out those interviews and in report preparation.

A decision was made by the team as a whole that all 17 delegations of the current CTRD project area should be visited, and that in each delegation, a representative selection of subproject activities be visited, and beneficiaries interviewed. An attempt was made to divide the visits in such a way that a representative of each sub-team would be available for each visit.

Two additional methodological steps were taken which the team feels were beneficial to the data base established for the evaluation. First, the institutional/organizational sub-team designed and administered a questionnaire to all the subdivision heads of the CTDA as well as to all the division (Direction) heads at the headquarters level. An analysis of the results of this questionnaire exercise is presented in Annex E. Second, the economics sub-team designed a farm budget format for the subdivision heads to fill out, on the basis of additional interviews, for those farms which the team had visited. The results of this exercise were analyzed during the evaluation report preparation, and are discussed in Chapter IV.

The Project Managers in the USAID/Tunis ARD Office were available, in Tunis and in the field, to assist the team in obtaining data,

and providing historical background and explanations of program issues. The team also worked extremely closely with the head of the Planning and Evaluation Direction, who was deputed to backstop the evaluation team within the CTDA, as well as with his colleagues, and with the Tunisian and expatriate TA advisors.

Two debriefings were held with AID and the CTDA during the evaluation process -- the first an initial meeting with CTDA, USAID and the entire team -- when an executive summary including broad-brush conclusions and recommendations had been prepared. A second set of meetings was held when an issues, conclusions and recommendations paper had been prepared. One meeting was held at the CTDA offices, with four members of the team, and another, later at the USAID with three members. The PDG of the CTDA and his senior staff have thus discussed each recommendation with the team, and some recommendations presented here reflect, therefore, the suggestions of CTDA and USAID/Tunis.

The team would like to express its sincere appreciation to all the CTDA headquarters and delegation level staff who spent so much time and effort to help make this evaluation complete and objective, as well as to the USAID/Tunis staff who helped achieve the same result. We must, of course, take responsibility for any oversights or mistakes of fact or interpretation that may occur in the report, however.

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LIST OF ABBREVIATIONS

AHA	Aménagement Hydro-Agricole (CTDA)
AIC	Association d'Intérêt Collectif
APMANE	Assistance aux Petits et Moyens Agriculteurs du Nord-Est
ARD	Agriculture and Rural Development Office (USAID/Tunis)
ASDEAR	Association - Développement et Animation Rurale
BNT	Banque Nationale de Tunisie
CES	Conservation des Eaux et des Sols
CGDR	Commissariat Général du Développement Régional
COGEDRAT	Commissariat Général de Développement Régional et d'Aménagement du Territoire
CRDA	Commissariat Régional au Développement Agricole
CTDA (ODTC)	Central Tunisia Development Authority
CTRD	Central Tunisia Rural Development Project (USAID)
CTV	Cellule Territoriale de Vulgarisation
DAAF	Direction des Affaires Administratives et Financières (CTDA)
DAPME	Direction de l'Assistance aux Petits et Moyens Exploitants
DPE (EPU)	Direction de Planification et d'Evaluation (CTDA)
DRE	Direction des Ressources en Eau
DRS	Direction des Ressources en Sol
EEC	European Economic Community
EGTH	Etudes et Grands Travaux Hydrauliques
ESAK	Ecole Supérieure d'Agriculture du Kef
ESSU	Extension Service Support Unit
FOSDA	Fonds Spécial de Développement Agricole
GOT	Government of Tunisia
IBRD (BIRD)	International Bank for Reconstruction and Development
IDA	Institute for Development Anthropology
INAT	Institut National Agronomique de Tunisie
INRAT	Institut National de la Recherche Agronomique de Tunisie
LIBOR	London International Bank Offer Rate
LOP	Life of Project
MOA	Ministry of Agriculture
MOE	Ministry of Equipment
MOH (MOPH)	Ministry of Health (Ministry of Public Health)
MOP	Ministry of Plan
OEP	Office de l'Elevage et des Pâturages
ODS	Office de Développement du Sud
OMV	Office de Mise en Valeur
OMVVM	Office de Mise en Valeur de la Vallée de la Medjerda
OSU	Oregon State University
PACD	Project Activity Completion Date
PDG	President Director General
PDR	Programme de Développement Rural
PDRI	Programme de Développement Rural Intégré

PIL	Project Implementation Letter
PMI	Protection Maternelle et Infantile
PP	Project Paper
PPI	Public Irrigated Perimeters
PVO	Private Voluntary Organization
SCF/CDF	Save the Children Federation/Community Development Foundation
SMAG	Salaire Minimum Agricole
SONEDE	Société Nationale d'Exploitation et Développement des Eaux
TA	Technical Assistance
UNAT	Union Nationale des Agriculteurs de Tunisie
WUA	Water Users Association

CHAPTER I
CENTRAL TUNISIA PROGRAM EVALUATION
SUMMARY AND CONCLUSIONS

A. EXECUTIVE SUMMARY

1. General Conclusions

The Central Tunisia Rural Development Project and its subprojects have had their largest impacts in Kasserine governorate, where 70-80% of all AID resources have been spent. This concentration is largely the result of changing areas of responsibility of development organizations outside the Kasserine governorate rather than the result of concerted efforts to concentrate AID assistance there.

Two main non-production interventions in Kasserine--rural potable water and health--have reached about 65,000 and 50,000 beneficiaries respectively, which is 25-30% of the total potential beneficiary population. This would mean that, if no overlap of beneficiaries between the two subproject activities were assumed, 50-60% of the target population would have been reached.

The principal economic (production) interventions--in part suggested by AID and AID-supported--have been (a) credit for privately-owned and operated shallow wells and (b) small irrigated public perimeters. Shallow well loans for surface wells in the CTDA action area number nearly 2000, with nearly 1800 having been financed largely with AID credit funds (if AID makes its final contribution to the credit fund under the Irrigation subproject). Over 1300 households will have directly benefited, in addition to unquantified numbers of non-family workers on and off the farm. Under the same subproject, 1000 hectares of small public perimeters have been irrigated, benefiting over 600 households, with about one-fourth of the total financed by AID. The principal problem on the Irrigation subproject is slow rates of repayment on surface well loans. Based on a July 1985 APMANE-USAID evaluation, CTDA and BNT are now taking action to remedy this situation. Even with low repayment, the beneficiary to cost, the economic returns to costs and the public cost to benefits ratios on surface wells are considerably better than on the PPIS in the subproject, and are generally conceded to be better than PPIS in general in Tunisia.

A third production-related intervention, Dryland Farming Systems applied research, has, to date, been among the weaker elements. This included demonstrations and trials which

usually are slower to show production/income results than the direct interventions cited above. However, these have, if anything, been slower than usual, given experiences elsewhere with similar projects. The principal outputs of applied research have been evidence that some increase in income can be obtained from better dryland cereal production practices, and the development of two improved barley varieties that are in the seed multiplication stage. Under the Extension and Outreach subproject, five participants have been trained to the M.S. level, and low-cost methods of irrigation have been developed and extended which require less water per unit of land irrigated than conventional methods. Seven person years of technical assistance have been provided under this subproject to date.

Institutional strengthening has been provided to the CTDA under the Area Development subproject in the form of over 5 person years of expatriate and Tunisian technical assistance in regional planning, macro-social data gathering and analysis, project management and monitoring, project identification and local-level project planning. Newly-arrived specialists are being provided to give TA in project design and in project monitoring and evaluation. The subproject is also funding assistance from a private-sector consulting firm (SCET/Tunisie) to the Planning Direction of the CTDA to identify projects at the delegation level for the 7th Plan.

Overall, the results in terms of AID's original intention to develop a capacity in the CTDA to do macro-economic regional planning have been minimal. This U.S.-type of approach was seen to be inappropriate to the Tunisian situation as of the evaluation of 1981. Also, due to factors outside the control of the CTDA and AID, recruiting and retaining good and trained staff for this and other CTDA directions has been a problem, and during the project period, other GOT agencies have been charged with more conventional macro-economic, inter-sectoral regional planning responsibilities. Nevertheless, CTDA has carved out a role at the governorate level by taking on local-level project identification and studies tasks. Thus, they have created the beginning of a link between centralized national planning and local level project identification and implementation.

Project/program evaluation skills are still under-developed, however, and should continue to be reinforced. Evaluation applied to all CTDA activities should assist the CTDA and other cooperating agencies to improve programming of complementary activities in support of agricultural interventions, including marketing. A major weakness of the subproject results to date has been in the generation of micro-economic and farm management and socio-economic impact data which could have been extremely

valuable in guiding future planning of interventions and development of technology for projects which could have been undertaken by CTDA, but which were not. Even so, the results in Central Tunisia point to major gains possible from improved irrigation water management throughout the country.

Internal organizational and management improvements sponsored under an IBRD project have just been put into place at CTDA, but this evaluation suggests some additional changes keyed to the current strengths of the Office and to its likely role in the next five years or so. Relationships between CTDA and other complementary and competing GOT agencies are on the whole as rational as Tunisia's characteristic institutional proliferation will allow, and the Office's comparatively better track record in implementation and impact is cited as the reason why it is increasingly given responsibility for implementing GOT regional programs such as the PDR and PDRI. Since approximately 75% of the funding channeled to the CTDA is from the GOT, including such programs, this is significant.

However, recent changes in the CTDA's statute have yet to be operationalized. Such changes should enable the Office to become more effective in project design and implementation in its action zone.

Over the next five years, the CTDA should become more active in non-production activities in the other two governorates that form the Center-West economic region--Kairouan and Sidi Bou Zid--in ways that complement the activities of the OMVs there. In the meantime, relationships between the CTDA and the CRDAs in Kasserine, Siliana and Gafsa should be further rationalized to increase cost-effectiveness and to improve the content and quality of extension. This in turn could be supported by the introduction of micro-economic farm management studies and related social science studies, in addition to, continued agronomic applied research. Emphasis on extension messages that are appropriate to the whole farm, both irrigated and dryland portions, and related changes in coordination of extension services should also improve production results and relationships between the CTDA and its target population.

2. General Recommendations

a. For The Government of Tunisia:

1) The personnel statute of the CTDA should be revised and made similar to that of COGEDRAT and ODS, to make possible recruitment and retention of highly qualified professional staff. AID should assist the CTDA, if appropriate, to obtain this sort of change from the central GOT.

2) Within its action zone, CTDA should be given project identification, design and evaluation responsibility--joint with the local authorities--for all the delegations in which it implements projects and programs.

3) Increasingly, CTDA should be encouraged to design and implement extra-agricultural projects in Kairouan and Sidi Bou Zid, since these are also part of the Center-West economic region.

4) CTDA should be given a role in collaboration with the various agencies involved in reforestation and soil and water conservation in order to help catalyze these activities, including dealing with social costs of deferred land use during development of reforestation, soil and water conservation and range improvement activities.

5) The GOT should examine the results beginning to emerge from the efforts of CTDA to improve water management and increase the production and income generated by a given quantity of water by:

(a) More efficient and less wasteful water distribution and application systems.

(b) More supplemental and less intensive irrigation.

(c) Giving user groups greater responsibility for management and operation of their potable (and shared irrigation) systems.

b. For CTDA: In addition to above:

1) Establish a better balance between dryland and irrigated agriculture.

2) Place greater emphasis on small individually owned or shared and operated wells, particularly surface wells.

3) Undertake immediately, on an accelerated basis, the improvement in surface well loan management looking to longer-term divestment of the credit function and other similar activities such as supply of inputs and machinery services.

4) Establish a system for:

(a) Collection and analysis of micro-economic and farm management data in the Extension service and

(b) For socio-economic impact data collection and analysis (in the Planning Direction).

5) Place greater emphasis on a whole farm approaches to extension.

c. For USAID: In addition to support of the directions suggested above:

1) Establish a schedule for reimbursement of the balance of funds for surface well credit (\$2.08 million) with tranches tied to accomplishments in improvement of loan management by CTDA and BNT (e.g., \$500,000 in April, \$500,000 in July and the balance Sept 1). Early reimbursement of the funds advanced from FOSDA is politically significant.

2) All the parties involved should get together and review carefully the role and performance of OSU in support of collection and analysis of physical, economic and social data and also in coordination of research and range management in support of Central Tunisia development. Appropriate action should be taken after this review.

3) The large already sunk Tunisian investment in irrigation, the low current returns and the high potential returns from better water management and progress in this area under the Central Tunisia Project, all strongly argue for major future concentration of US support on efforts to improve water management, in Central Tunisia surely, but also in other parts of Tunisia.

4) Continue to support the Central Tunisia development effort including:

(a) Modest amounts for surface wells in areas outside Kasserine when the credit situation is resolved. Available water in Kasserine has been nearly exhausted and supplies in the Gafsa Governorate area are very limited, but Sened is a current candidate for such support.

(b) Continued support of the extension TA at least until returning participants have been settled into place. Continue support of dryland farming and range management in Central Tunisia but with substantial modifications from the present approach.

(c) Continued modest support of potable water in Central Tunisia.

(d) Support tree and cactus planting and soil and water conservation programs. Given USAID planning time frames and the need for long-term efforts in these areas, AID may want to assist primarily in dealing with the social impacts of temporary loss of income as land use is being transformed.

B. RECOMMENDATIONS RELATED TO CTDA ORGANIZATIONS

1. The overall objective will be to have correspondence between the area of planning and intervention of the CTDA and the economic "region" of the Centre-Ouest. There should be short, and medium-term scenarios, however, that will take into account the current capacity and role of the CTDA, and other agencies, and the probability that it will take several years for the Commissariat au Développement Régional et à l'Aménagement du Territoire to be fully staffed and financed to carry out its regional planning mandate.

2. a. In the short term, the CTDA should do project identification and related studies (feasibility, financial analysis, economic analysis) and implementation in the same geographic zone. Thus, if it is doing interventions in Gafsa Nord, it should also be involved in project identification and studies for those projects it will implement.

b. The CTDA may also begin, as part of a transition to the final objective, to carry out studies, and to identify and implement projects in this and in other zones (e.g., Kairouan and Sidi Bouzid) where it has a particular mandate or competence that the OMVs do not have -- e.g., marketing studies, activities in support of improved private sector marketing, small and medium agro-enterprise, etc. Activities implemented in Kairouan and Sidi Bouzid might concentrate on non-agriculture production activities so as to avoid competition with the OMVs. The planning/project identification function would thus also, presumably, avoid competition with the emerging planning and evaluation units of those two OMVs.

c. For the medium term, the CTDA should increase its ability to carry out pre-project studies and analyses (baseline and others) and to carry out project monitoring and evaluation activities for those projects it implements. The biggest gap we have seen is in this area. This would include sociological/anthropological, as well, as agricultural micro-economic and farm management studies, and studies related to improved marketing possibilities for production projects already in progress or to be carried out in the future.

3. Insofar as the CTDA is likely to be given a substantial responsibility to implement GOT "regional programs" -- PDR, PDRI, PAAF, famille productive/jardins familiaux, emploi de la jeunesse -- it should have a comparable input into decisions about the types of projects to be included, and within the framework of sustained policy, the project characteristics -- e.g., interest rates, proportion of "give-away" versus beneficiary or end-user contribution, choice and range of beneficiaries, etc. This would

become part of its overall project identification role. The CTDA should conduct applied research on the appropriateness and feasibility of implementation of various programs in the region and prepare recommendations for higher levels of the GOT. As such, it would have a larger role in decision-making.

C. RECOMMENDATIONS ON STAFFING, TRAINING AND TECHNICAL ASSISTANCE NEEDS

1. A sharp reduction in the future in expatriate technical assistance and training abroad, particularly long-term participant training.

2. Greater use of on-the-job training and carefully tailored short-term TA, through which CTDA should be able to make more efficient and effective use of its limited professional staff. Due to the overall GOT budget crisis, it is unlikely that the CTDA will be allocated substantially increased staff ceilings. Thus, more will have to be done by those already on board, and more use may have to be made of contractors from the private sector for clearly-defined studies and other analytic tasks.

o DPE

-- 3 to 4 intermediate-level staff members (adjoints techniques in statistics and agro-economics) for tasks of data collection and treatment;

-- 1 high-level, experienced social scientist for conducting analyses related to beneficiary participation in project formulation and implementation;

-- a good training program for the presently employed staff members defined so as to help them in the accomplishment of their tasks and linked to professional promotion;

-- Tunisian senior technical assistance for medium-term periods (1 to 2 years) provided by Ministries (MOP, MOA, etc.), the University and other Tunisian development institutions with the provision of attractive advantages;

-- US technical assistance in the fields of farm management economic feasibility and impact studies, and computer science.

o DAAF

The staff needs training in staff management.

-- Accounting

-- Financial analysis

-- Administrative procedures - mainly in operational budgeting and in computer use.

-- The administrative staff and financial administration needs training in public administration.

o Budgetary Direction

-- The staff needs training in computer and public management procedures.

-- The Director should have a training course in budgeting, cost/benefit analysis, computer and public management.

o Planning and Monitoring Direction

-- The staff must be augmented by hiring new persons in statistics, computer operation, public administration and sociology. They should be assisted by economists and farm management personnel in Extension.

o AHA Direction

The staff needs training in:

-- repair and maintenance of surface wells and the PPIs to advise and assist farmers and private repair teams;

-- agricultural and extension direction.

3. Institutional Development Including Technical Assistance

a. OSU should be required to develop explicit plans for improvement in its contribution to coordination, to timely submission of analyses of field data and to micro-economic and farm management analysis. Failing this, CTDA and AID should consider a different arrangement for these essential inputs to the activities it supports which are aimed at contributing to development of Central Tunisia.

b. The present Extension advisor's contract is to terminate soon. CTDA should immediately review the need to continue this position and make arrangements accordingly. The team is of the view that the position should be continued at least initially for two years.

c. IDA management, the TA specialists and CTDA senior management and USAID should meet together to resolve the various issues about the scopes of work and reporting responsibilities of the IDA TA. Future short-term social science consultancies under the IDA project should be carried out primarily by Tunisians especially where they involve studies of the population rather than management or organizational assistance to CTDA itself.

d. A training session in shallow well equipment repair and maintenance should be provided to AHA Direction technical staff.

e. Coordination and cooperation between CTDA and the Range Management project should be strengthened. The representation of CTDA on the Range Management Committee provides a mechanism for top-level coordination. CTDA should make maximum use of this mechanism and draw more on the OEP project staff for training and for technical information to strengthen range interventions in Central Tunisia.

f. More attention should be given to applied research on supplemental irrigation potentials and more careful applied socio-economic research should be carried out to find ways in which the less-advantaged small holders can be given access to improved water resources and the technology to manage them effectively.

g. In designing future assistance to Central Tunisia, USAID should work carefully to reinforce gains already made, including the development of the CTDA as a viable design and implementing organization. In order to ensure this outcome AID should:

- 1) Maintain the CTRD umbrella project approach for at least the next five years; new subprojects may be added, and old ones expanded, e.g., for soil and water conservation, farm management economics, marketing strategies and cooperative development;

- 2) Ensure that such subprojects follow the selection criteria presented in the original CTRD PP, particularly that funds be provided through the CTDA; and support recommendations 2 a, b above.

- 3) Involve the DPE (Direction de Plannification et Evaluation) and other Directions in CTDA, as much as possible, in subproject design, as is currently being done for irrigation in Sened;

- 4) Maintain assistance to CTDA separate from national-level agriculture projects. This will be essential if CTDA is to effectively implement the agriculture activities in its current area of operations and assume a broader development role in additional areas of Central Tunisia as is being proposed;

- 5) That AID technical staff continue to work directly with the appropriate technical staff in CTDA for technical aspects of project management, but centralize "program" management and related administrative functions within the ARD office.

6) In one case we would recommend long-term participant training, e.g., for the present Director of the DPE.

7) We recommend that a consultancy be funded which will look at the training needs of all of the CTDA Directions, at both the subdivision and headquarters staff levels as well as the ways in which needs can most effectively be met in terms of the other recommendations and conclusions of this evaluation.

4. CTDA Utilization of TA

The Tunisian resident advisor position should be extended for at least a year. It would be useful if this individual were given the responsibility of designing a system by which there would be meetings between and among the TA advisors based on concrete decision-making requirements that affect more than one Direction -- e.g., the creation of and improvements in the data bank, the utilization of the new implementation plan system, improved utilization of computer technology, the development and application of the project monitoring and evaluation system, and the like.

This would not mean that the Tunisian Resident Advisor would have any supervisory authority over the other advisors, ut rather that he would serve as a facilitator for improved communication among, and utilization of, the other advisors as well as himself.

Such meetings or seminars would have to be based on real topics, mutually agreed to by the Direction heads, and the PDG if necessary, so that key CTDA staff would be willing to participate, and see it as in their interest to do so. Such seminars would be of benefit in organizational development terms, but would also have a de facto training function, which is part of the scopes of work of all of the TA advisors. In some cases, e.g., for the monitoring and evaluation system and the "tableau de bord", such seminars should include subdivision heads and field personnel. In others, they might be restricted to TA staff and Direction heads, or even to subsets of several Division heads and their service heads (e.g., Planning and AHA, or AHA and Agriculture, or Agriculture and DAAF).

Generation of such a meeting/seminar system under the guidance of the Resident Tunisian Advisor could be the product of a meeting of all concerned parties with the PDG on the subject of improved TA utilization. If this were the case, it would have his stamp of approval, and would likely be taken more seriously. He could also then participate in those meetings or seminars that involve issues over which he has ultimate decision-making authority, and/or about which he is particularly concerned and which affect the whole organization, such as documentation and information utilization.

D. RECOMMENDATIONS ON INTERVENTIONS

1. Experimental Fund

Devise means to make the Experimental Fund effective or close it out. Some of the measures that might make it more effective include:

a. Reverse the assumption that the CTDA should not be involved in design and implementation of Fund projects, if necessary with a new PIL.

b. Increase the potential size of projects to extend coverage and decrease staff-intensity, while meeting the present orientation of the MOP.

c. Recruit to the CTDA, or identify outside it and contract for project design professional services. Qualification for such individuals should include knowledge of the region and creative/innovative talents.

d. Use the Experimental Fund as a laboratory for agri-business and marketing-related income-generating activities; evaluate these closely and provide resources for the replication of proven approaches.

e. Insure that criteria and mechanisms are identified on the basis of which a pilot activity judged successful will be replicated.

f. Refrain from funding pre-designed projects from PVOs or other entities that have largely a social welfare orientation, and that do not conform to the overall project selection criteria of the CTDA.

Of these we think (d) is potentiall most important and relevant to the income-oriented priorities of the Central Tunisia Program.

2. Production Emphasis

a. The CTDA should concentrate future irrigation development investments in Central Tunisia on (a) surface wells where technically feasible (some of which might be shared by several farmers), and (b) low-volume deep wells which would involve sharing of water and shared management and operational responsibility. Maintenance of PPIS is necessary; development of Irrigation Associations (AICs) to take over these tasks is desirable in the interest of increased efficiency and reduction in the burden on public agencies and the treasury.

b. Greater emphasis should be given to (a) water management, particularly water delivery and application systems which reduce water losses and (b) water application which is better keyed to plant consumption needs. This should be applied to both PPIS and surface wells.

c. Supplemental irrigation should be emphasized in applied research followed by implementation with a view to a balance with intensive irrigation.

d. In addition to 1 (b) and (c) above, greater effort should be made in development and testing of low cost programs to increase ground water recharge and, as appropriate, in subsequent implementation of these programs.

e. The CTDA should place more emphasis on integrated farming systems and complete farm plans; this should specifically include forage and livestock along with crops and include both irrigated agriculture and drylands (with crops and range) where the farmer has such resources.

f. The CTDA should provide a better balance between irrigation and dryland agriculture (that is, more of the latter). This is particularly important in view of the virtual completion of development of much of the known water resources in much of the CTDA action area.

g. Cooperation with forestry, soil and water conservation entities is essential in development of coordinated programs for afforestation, soil conservation and ground water recharge on public and private lands that should take place. CTDA should be involved and play a catalyzing role. This should include provision for socio-economic problems that arise in connection with deferral of income flow resulting when land is temporarily taken out of production for tree planting, and soil and water conservation activities. Unless new action plans include specific provision for compensation, or other solutions to the social problems that may arise, tree planting and soil and water conservation programs are likely to have very limited success. Large-scale reforestation and afforestation do have a role to play, but particular emphasis should be placed on small-scale tree and cactus planting on private lands.

h. Financing should be provided for a program of comparative physical and economic analysis of principal cactus species and varieties for drought and cold tolerance yield under different soil and fertility conditions, resistance to grazing and disease, planting requirement and nutritive value. This is estimated to cost about \$25,000 per year over 10 years.

3. Non-Productive Activity Emphasis

a. The CTDA should develop an explicit set of criteria derived from national goals and a coherent strategy for development of Central Tunisia for the choice of actions, projects and programs that it will undertake. These criteria should include consideration of (a) economic benefit/cost (b) social benefit/cost and (c) the appropriateness of the activity in terms of others being implemented, e.g., place in terms of the "regional" plan.

b. In terms of micro-level social benefit/cost considerations, in determining choice of non-agricultural projects to receive priority, emphasis should be placed on the probable impact of the project on:

1) Those quality of life factors which, inter alia, have a bearing on migration--education, electrification, improved housing, potable water.

2) The linkages between the impact of the project on income-generation and employment and the improvements possible in quality of life at the household level.

3) The related impact in terms of providing possibilities for local investment of agriculturally-derived surplus income--e.g., small and medium enterprises.

4) The impact of the project on the division of labor at the household level, and among various social categories--men, women, youth, children.

4. Socio-Economic Analysis

a. Micro-level, household budget and consumption studies should be carried out to monitor the impact of project and program interventions. Quantitative and qualitative studies should be carried out on family labor and on employment generation at the farm level disaggregated by sex and by age. Other impacts of project interventions on men, women and youth should also be evaluated on a routine basis.

b. The CTDA should do systematic whole-farm data collection, recording the inputs and outputs for each crop, the cropping patterns by season and area, the labor inputs in terms of time and costs, and marketing methods and costs. These costs should be collected on a stratified representative sample of the farms in the area--and used as a basis for refining the CTDA's model farm concept and for planning. Clearly, such a data collection and analysis program repeated annually will build into a time-series, demonstrating the effects of changes in policy, climate, public taste, etc.

In parallel, data should be collected on the other elements of farm family life such as off-farm income, educational level, consumption patterns, measures of health, time use on tasks other than the farm, etc.

c. Establish a staff and capability for micro-economic and social studies and analysis in the CTDA.

1) The task of micro-economic analysis and farm management studies (along with related staff and other resources) should be assigned to the Extension Service in the CTDA. (These analyses would also be used by the Planning Directorate for planning.)

2) Social scientists, and the evaluation and related social impact analysis functions within CTDA, should be assigned to Planning. This staff should work with other Directions as appropriate.

3) Implement the recommendations in the Pro/Ags of the Rural Extension and Outreach and the Area Development subprojects calling for the recruitment of social scientists to the CTDA.

4) Develop a system for continuing training of CTDA staff to help them to increase their awareness of the social problems that are characteristically faced by peasants of semi-nomadic origin, both in Central Tunisia and in those other countries where there are similar populations encountering similar problems.

5) For the new Potable Water Project, be careful to see to it that a criterion for the selection of the head of the Self-Management Unit, among other requirements, is the ability to conduct a field survey, and also that the professional status of the members of this unit does not differ from that of the CTDA's agronomists and economists.

6) For the Launching of the Service Cooperatives. To devote a part of the Experimental Fund to develop a pilot experiment by launching a service cooperative in the Sbiba delegation. To devote as much time as is necessary for the successful outcome of this experiment.

The first task under both (a) and (b) above should be to review carefully work done to date and to develop work plans for the next year or two. USAID should be prepared to finance some technical assistance (Tunisian or expatriate) to assist in this initial phase and to assist in annual reviews of results and replanning over the next 3-4 years.

5. Marketing and Cooperatives

a. Careful analysis should be carried out with central agencies of likely future supply, demand (including clear export opportunities) and prices of tree crops as a basis for future planning of fruit programs. CTDA should consider the requirements for profitably marketing fruit domestically and internationally in fresh and processed form.

b. The GOT/CTDA should consider the effect of the various pricing policies which it currently pursues. This should include and examine the effect on the farmer and the improved efficiency which could be achieved by straight transfer of funds to the municipalities rather than the cumbersome distortion of the economic framework by taxes on production within which the farmer is supposed to make his way.

c. The Ministry of Economy should play more of a market intelligence role and less of a regulatory role. For the purposes of advising the farmer and the government, and in its regional planning, CTDA should cooperate with the Ministry of the Economy, Direction des Prix and other agencies in analyzing and disseminating market intelligence. These data communicated to the farmer will (with the help of the extension service) facilitate rational decisions on marketing in the short run and crop choice in the longer term.

d. Establishment of a grading system should be considered for certain products, e.g., for sales to points at long distances from the production point - Tunis, Sousse or export.

e. Together with DAPME in the Ministry of Agriculture, both at the central and governorate levels, CTDA should work more actively to facilitate the formation of viable service cooperatives. These cooperatives will, of necessity, follow the statutes and pattern established for such entities in the GOT in terms of financial and management decisions. CTDA should carry out studies of the various bases on which individuals in the relevant region are most likely to cooperate and form viable groups; studies of the comparative advantage of service cooperatives in the various sub-regions for the purchase of inputs and their resale to members of the cooperative, and analysis of the type and availability of management that would best suit each type of activity and cooperative. It is suggested that assistance for such studies and related training be provided to CTDA, in conjunction with the appropriate representatives of DAPME.

f. A portion of the Experimental Fund could be spent for the creation of cooperative income-generating activities for women -- weaving and other types -- that would be controlled by the women themselves. Good market studies should be a prerequisite for choice of activities, and appropriate training should be provided.

g. TDA should assume a principal role in promotion and support of private enterprises including private cooperatives in marketing of agricultural products, distribution of inputs and supply and production services. Specifically it should:

1) Conduct feasibility studies to identify requirements in these areas, opportunities for private firms and cooperatives, and then specify courses of action;

2) Assist cooperatives and private firms in preparation of investment and operational plans and in identifying sources of capital.

3) Provide technical and management advice to small private firms and cooperatives.

4) As soon as feasible CTDA should divest itself of input distribution and mechanical service functions.

h. Harvesting methods, timing and on-farm storage should be studied for incorporation in the extension packages.

A CTDA cooperative marketing study should examine:

-- The potential for input sales in terms of volume expected and potential margins in order to ensure generation of funds sufficient to make a cooperative viable. The effect of competition from CTDA and other government agencies as input suppliers should also be considered.

-- If the cooperative intends to handle farmers' produce then a careful study should be made of the present national flows of fruit and vegetables. Past studies have shown the produce tends to flow into the Tunis/Sousse wholesalers and that provincial buyers go there from all over the nation to seek supplies. This pattern is a very typical one in many countries where the assembly and redistribution process takes place in one or two main centers. Producers a long way from these centers can be at a severe disadvantage because of transport costs; established patterns are difficult to break and the distant grower cannot do it on the basis of price. Therefore, the questions of quality and seasonality must be considered to put a superior quality or out-of-season product on the market.

The question of management must be examined. In view of the difficulties of entering the market, the trading manager must be someone who knows the trade and has the right connections in it. Such a manager, almost certainly from the private sector, would require a good salary which, initially, the cooperative could scarcely

afford. The cooperative study should also examine ways of overcoming the problem of at what point the cooperative should attempt to enter the market, e.g. by using a particular wholesaler on particular markets, by becoming a wholesaler in its own right or by becoming a retailer, for example.

-- The transport needs and costs should also be examined, both cooperative-to-market and farmer-to-cooperative. Storage, grading and packing costs should also be included.

6. Surface Well Credit

a. CTDA should accelerate efforts to resolve problems in the CTDA-BNT surface well credit operation along lines recommended by the APMANE-USAID evaluation team.

b. CTDA should begin now to explore ways to divest itself of the surface well lending activity. DAPME and APMANE would appear to be candidates to take over the CTDA medium-term credit program for surface wells and to provide development credit to cooperatives.

c. The team recommends that USAID release the remainder of the total fund planned for surface well credit (out of the \$3.2 million programmed surface well credit) to reimburse BNT for funds advanced by FOSDA for credit in the hopes of AID funds becoming available (\$2.08 million). USAID should tie the release to specific progress, e.g. \$500,000 now, \$500,000 on or about July 1, and the balance about September 1, assuming CTDA and BNT continue to implement necessary corrective actions.

d. In conjunction with implementation of recommendations on divestment of input sales and mechanical services, CTDA should end involvement in production credit.

7. Extension and Applied Research

a. Continuity of progress in building the ESSU is vital and over the next year or two the newly qualified staff should have the continued input of the present expatriate staff. This should take the form of:

1) Extension of the present senior advisor. Current Tunisian staff have expressed the view that they value the expatriate technical advisors as neutral sounding boards for new ideas before presentation to the management. Assistance in programming future action is of paramount importance, and the present occupant of the advisor post should have an active role in this to help in settling-in the returning Masters graduates.

2) Continued assistance in the communications department. Yet again, it is recommended that the Tunisian designated as "storeman" but who has had long experience in this department should have some appropriate training and be given more responsibility. This department should urgently review its role, equipment, staff needs and training; it cannot continue to rely on technical assistance indefinitely.

3) The irrigation technical assistant should be extended for at least a month or two to help over the period of return of the other staff. His counterpart, who is judged very competent, should be nominated to lead the water management section of the ESSU. As he moves to the new position, he should be given short-term support on TDY basis by the present advisor, or by another OSU staff member who has prior experience in Tunisia and is familiar with the needs.

4) Consider, as appropriate, continued assistance by Peace Corps Volunteers whose past help has been well appreciated.

b. The first of the participants in the Masters training program in the United States will shortly return. It is suggested that by June/July a plan for the organization of the extension service be prepared with a scope of work for the different divisions (arboriculture, horticulture, dryland, livestock, water management, etc.). Detailed programs of work should be worked out. One essential element of the plan should be a clear definition of the relationship of CTDA extension activities with those of each of the other agencies involved in one way or another with extension.

c. A program of adaptive trials and demonstration plots should be prepared. The priorities and demonstration needs should be clearly spelled out and the inputs of the different ESSU divisions defined. Where appropriate, the social impact of proposed changes to the farming system should be considered, as should the economic implications. CTDA should not allow the "research" aspects of its work to become predominant. It would seem to have a role in research which would be closer to the needs of the farming community than might normally be the case with typical research organizations.

d. The West Central region of Tunis should quickly be provided with soil testing facilities which are responsive to the farming needs of the area. Kasserine has a laboratory which can do pH and calcium testing, but, as discussed above, is overburdened. This laboratory should be upgraded to serve the area.

e. Conspicuously, there is virtually no capacity in the ESSU at present for farm management, micro economic/farming and related data collection and analyses systems. The CTDA, in conjunction with CRDA, should have a unit which accumulates farm production, economics and farm management data, particularly on a whole-farm basis. This unit should be examining cropping patterns and opportunities within the framework of water availability, market opportunities, availability and cost of the factors of production and climatic constraints.

The Division de la Planification, du Suivi et de l'Evaluation also needs farm level data and the USAID/APMANE evaluation called for a financial farm planning capability; this problem of inadequate data should be remedied as soon as possible.

f. The CTDA extension service should divest itself of responsibilities of credit provision and loan collection as soon as possible. Its farm economics data can serve to assess loan feasibility but extension agents should not be credit agents.

g. The mobility of extension agents and the programming of their farm visits should be examined in order that this expensively acquired knowledge can be conveyed to the farmer and that the farmer can have access to data. Horticultural crops particularly will not wait when attention is needed.

h. Market intelligence appears not to be available to the farmer. Many farms are considerable distances from reasonable sized sources of demand and a small farmer cannot afford to spend large amounts of time or money undertaking abortive marketing journeys.

i. The needs for a water management division appear important and the recommendations of the current advisor should be examined by CTDA and USAID and the current counterpart be assisted as necessary.

8. Recommended TA for a Farm Management Economics Component

TA is recommended for a new farm management/micro-economics capacity building activity in Extension. A Tunisian agricultural economist, US/UK-trained in farm management economics with some experience since his training, should be hired as a Resident Advisor. The task will be to develop the methodology for a regular survey of a sample of farms in the CTRD area and for the storage and analysis of these data. Since the intention of the survey is to develop a time series, his tenure at CTDA should be for at least two years and preferably three.

Two assistant agricultural economists should be hired who would assist with the preparation of the surveys and the training of the interviewers (who would initially be subdivision staff, mainly extension agents) and initial analysis of results. These staff members would probably be of the educational level of the current Service de Production Végétale cadre, i.e., baccalaureate plus two years at the Ecole Supérieure d'Agriculture, with some specialization in agricultural economics. It would be ideal if these staff members had practical agricultural experience. Additionally, some clerical assistance would be required to do data extraction and input into the computer.

The agricultural economist's role would be to integrate the CTDA data collection frame with that of other services already concerned with this work in agriculture. This task will have been made easier by the data assembly in cooperation with other services which the Planning Division of CTDA recently undertook for the 7th Plan.

The agricultural economist would also assist in evaluating technical proposals before they were extended to farmers and in assessing/surveying the markets for crops which are being grown in Central Tunisia. In this, the cooperation of the Resident Advisor who is currently working in the Planning Division would be solicited. In fact, it is to be hoped that these would be close working relationships between ESSU and the Planning Division since the output should be complementary as regards special studies and the socio-economic aspects.

Once trained, the two adjoints techniques should be able to continue the routine farm management surveys with specialized inputs for analysis, interpretation and special studies.

9. Short-Term Expatriate TA in Economics and Marketing

To further strengthen the crucial work in economics/farm management and marketing, it is recommended that well qualified French speaking specialists be provided in economics/farm management and in marketing for 4-6 weeks per year over 4-5 years. In the first, somewhat larger assignment, they would help the Tunisian specialists design and initiate studies. In subsequent visits, they would assist in both the reviewing of data and analyses and also in design/redesign of work for the ensuing year. They might also be drawn upon to help conduct classes and in broader CTDA planning.

10. Future Subproject in Soil and Water Conservation

USAID/GOT should consider the current strategy for dryland agriculture and the role that soil and water conservation can play in improving prospects for dryland farmers as well as assuring future water sources.

A subproject should be designed in which CTDA has a central role in conjunction with Forestry, CES, DRE, and CRDA in soil and water conservation, prospecting and rangeland improvement. CTDA would be responsible for the socio-economic aspects of these actions and executing the parallel programs.

CHAPTER II

BACKGROUND

A. CENTRAL TUNISIA AND CTDA AREA OF INTERVENTION

The area of intervention of CTDA includes 17 delegations located in 3 governorates: Kasserine (12 delegations), Gafsa (2 delegations) and Siliana (3 delegations). Only the governorate of Kasserine is included in totality within the CTDA area.

The CTDA area covers 1,153,000 ha, 362,000 ha of which are cultivated while 791,000 ha are distributed between forests, range land and non-arable land. Average annual rainfall in the region varies between 200 mm (7.7 inches) in the southern delegations of Feriana and Sened and 450 mm (17.3 inches) in the northern delegations of Haidra and Thala. The region is much eroded due to downpours, poor vegetation and overgrazing, although plains with rich soil can be found in several parts of the region.

Population of the 17 delegation region reached 405,150 in 1984, 70% of whom are rural, 60% dispersed and 56% less than 20 years old. The population growth rate during the 1975-84 decade was, at 2.5% per annum, higher than the country's average of 2.3%. Density did not exceed 35 persons per km² compared with more than 350 in the coastal regions of the Sahel and the North East. However, the rural population density per ha of arable land is about .8, while not exceeding .5 in the Sahel and .7 in the North East which are much more richly endowed than Central Tunisia.

The average annual per capita income of less than 152 TD (about \$210) was in 1980 the lowest in the country. The percentage of poor population, i.e. whose consumption level was under the World Bank minimum subsistence level, reached 14% compared to 12% for the whole country. Living conditions greatly improved between 1980 and 1984 (e.g. 14.5% of households had potable water in 1984 compared to 5.2% in 1980), but they are still the poorest in the country in practically all respects (health, housing, potable water, etc.). This is especially true in rural areas which include 70% of the population.

Economic activity is mainly agricultural. Industry does not employ more than 14% of total working population and does not contribute more than 1.6% to national industrial production. Services such as tourism, commerce and banking are even weaker with less than 12% of employment and negligible contribution to the sector's national activity.

Agricultural activity is based mainly on dryland farming even though irrigation has substantially increased during the last 5 years. Cultivated area is distributed as follows:

Cereals	236,920 ha	(65%)
Trees	120,250 ha	(34%)
Vegetables	4,700 ha	(.1%)

Cereals contributed more than 74% to total regional agricultural production in 1984. This percentage will, however, decrease during the coming years because young trees will start producing in the next 5 to 6 years. Arboriculture was the fastest growing activity during the last 5 years, especially in irrigated areas and is expected to become the major contributor to agricultural production during the next decade.

Water resources are estimated at about 3200 l/s for the governorate of Kasserine; 2900 l/s are already being used or are programmed for agriculture, industry and home use. Only 9% of total known resources remain to be exploited. It is expected, however, that more resources will be identified in the future, but no precise data exist on the importance of these resources.

In Gafsa, out of 1000 l/s of known exploitable water resources, 723 l/s are already being utilized and 277 l/s are programmed. Not all of these resources are expected, however, to be renewable.

Only 25% of arable land presently used for cereal cultivation is considered appropriate for this activity on a long term basis. An estimated 20,000 ha is suitable for dryland fruit trees and nut production. Thus, the major effort for agricultural development in the future should concentrate on better use and management of rainfed agriculture, especially rangeland, fruit and nut production and maximizing output from the very limited water resources.

B. THE CENTRAL TUNISIA DEVELOPMENT AUTHORITY (CTDA)

By the mid-1970's, there was an emerging consensus that line ministries, including the Ministry of Agriculture, were not succeeding in meeting the development needs of all the regions of the country, and that the situation in Central Tunisia compared particularly badly with that in the more developed coastal regions. One response to this awareness was the creation of a series of Offices or authorities, to develop particular areas, which in most cases meant to carry out the development of irrigated perimeters. By 1975, there were 11 Offices de Mise en Valeur (OMVs), which were largely seen as more efficient and effective than the line ministries and the somewhat weak governorate structures.

The CTDA was created in August, 1978 when its enabling legislation was signed by President Bourguiba (see Chapter III), as part of a more general move toward decentralization and deconcentration on the part of the GOT. It began operation in January, 1979.

As noted in the 1981 CTRD evaluation, the CTDA was not just created as another OMV. "What was proposed was an Office de

Développement--to be an intermediary body between the governorate and national levels. The economic region chosen for its activities spanned several administrative districts. It would coordinate, integrate, and promote regional activities. Beyond this, the new Office was to plan and monitor innovative development projects which, when proven successful, would be turned over to the line agencies for administration" (p. 2).

The enabling legislation, mission, and structure of the CTDA as it began in 1979, and as it has continued to evolve are discussed in detail in Chapter III, and in the institutional analysis presented in Annex E.

Here, it should be noted that the CTDA was an innovative organizational form, which received strong backing from USAID from its inception, but whose creation was part of a trend on the part of the GOT toward increased deconcentration and decentralization, as well as toward the equalization of the quality of life in the peripheral as well as the more central regions of the country. Thus, it was not entirely a donor-created entity, as has sometimes been alleged, but rather responded to genuine and even pressing concerns on the part of the GOT itself.

C. THE CTRD PROJECT

The CTRD Project was designed as an umbrella project with a number of subprojects for various multi-sectoral and sectoral activities which, combined, were to yield more effective area development of Central Tunisia. In all, there have been ten subprojects. Two other projects--Rural Community Health and the Save the Children Federation community development project--have also been implemented in the "CTRD region" during the life of the CTRD project.

The project concept was based in part on prior USAID experiences in funding limited-scope integrated rural development activities in Siliana governorate, and specifically in two and then three of its delegations. CTRD's target area was eight delegations of Siliana, Kasserine and Sidi Bou Zid governorates initially--that is, the USAID project area did not correspond to the geographic area over which the new CTDA had some degree of area development authority, but rather to a smaller zone within that area. As the years have gone by, and the subprojects have been redesigned and modified, additional delegations have been added for USAID funding under them. Most recently this has included the delegations of Kasserine-Sud, Gafsa Nord and Sened (see map). Thus, by July 1985, the USAID-funded action zone and the area over which CTDA has titular development coordinating authority were coterminous for the first time. This includes a total of 17 delegations of three governorates--Kasserine, Siliana and Gafsa.

The Project Paper for the CTRD project states that the project would work through the CTDA through subprojects that would "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..." (p.6). The original target population for the eight delegations was approximately 200,000.

Eight criteria for subproject selection were outlined in the PP, one of which was that the CTDA would be the "responsible agency handling the USAID-assisted subprojects in the field." (p.8).

On pages 26-28, we have attempted to present the respective goals/purposes/objectives of all the currently-existing GOT-implemented subprojects as they were presented when the PPs were written. This can then be compared with the information presented above and in Chapter III, regarding the mandate and objectives of the CTDA as these were reflected in its enabling legislation.

Essentially, these subprojects may be seen to represent USAID's attempt to provide for, on the one hand, a multi-sectoral, management-oriented area development subproject, and, on the other hand, a series of essentially agriculture production (Irrigation) and basic human needs (Rural Community Health, Potable Water--four such projects), discrete subproject activities. According to the overall selection criteria mentioned above, each of these should have been coordinated and funded through the CTDA. Instead, the Range project was funded through the national Office of Livestock and Range (OEP), another semi-autonomous agency of the Ministry of Agriculture, and the Health project was funded through the Ministry of Health, since CTDA did not yet exist when the PP for this project was written.

There were two subprojects--Dryland Farming Systems Research and Rural Extension and Outreach--that also had cross-cutting features, especially from an institutional point of view. The first was to operate primarily with the Agriculture School at Le Kef, but with trials conducted with and through the CTDA, and results then being analyzed and put into appropriate sets of themes for farmer use. The latter subproject, which complemented the applied research activity, was to improve the ability of the CTDA and related agencies--primarily the CRDAs of the governorates in which the CTDA is working, that is, the Ministry of Agriculture line agency representative at the governorate level--to provide effective agricultural extension in irrigated and non-irrigated areas.

Three PVO subprojects, two with CARE/Medico for wells, and one for Save the Children/Community Development Foundation, were an attempt to provide inputs that would elicit and augment

participation at the local, community level. The hope was that this would then have a spread-effect and grow to fill in the gap between the deconcentrated (and hopefully decentralized) planning that was to be encouraged under the Area Development subproject, the top-down agricultural sub-sectoral and basic human needs subprojects funded and operated through the CTDA, and the beneficiary population and its needs.

The primary multi-sectoral, institutional strengthening component of the CTRD project is the Area Development subproject, whose purpose was to "establish CTDA evaluation and planning capacity to manage natural and other resources of the region with emphasis upon increased income, employment, efficiency, and access to rural infrastructure and services." This project was originally funded at a level of \$4,800,000. Under two AID centrally-funded cooperative agreements--one with University of Wisconsin for regional development/planning, and the other with Cornell University for rural development participation--the services of a number of U.S. experts were provided to meet the project purpose. For a variety of reasons, as of the evaluation of 1981, it was decided that these inputs had been inappropriate, and the TA from the two universities was discontinued (see Annex E).

Despite a genuine attempt on USAID's part to strengthen the brand-new CTDA, there was no way to accomplish this before starting implementation. USAID had attempted to strengthen CTDA in regional planning, program/project design monitoring and evaluation skills so that it would be able to generate baseline data. On the basis of this information CTDA could plan and develop its implementation activities (and then plan regionally to support eventual integrated area development activities). However, by approving simultaneously a large number of relatively complex subprojects that were designed by USAID, and not with the CTDA, there was a fundamental contradiction in terms between the mission to be fostered under the Area Development activity and the implementation imperatives of the other subprojects. With the benefit of hindsight, we may suppose that, had USAID waited to allow gestation by the new CTDA of concepts of planning, monitoring and evaluation--as well as related project design approaches--and then assisted the institution to design appropriate, manageable and more obviously integrated projects, the results might have been more effective and better coordinated or integrated. Similarly, the institutional strengthening objectives of the Area Development subproject might have been achieved more completely than has been the case. This would seem to be true for planning, project design, monitoring, evaluation, and project management as well.

In the sections of this report that follow, as well as in the annexes, the details of our assessment of performance under the various subprojects will be presented, together with our

recommendations for improvement in the future. Here, we have attempted only to present a broad-brush introduction to the CTRD project as a whole, and its various sub-activities, with a brief assessment of what appears to have been a basic design flaw. It should be noted in fairness, however, that this project was in a sense AID's parting gift to the GOT at a time when the disparity between the coast and the interior of the country in terms of economic and social well-being was becoming a pressing problem, and when USAID was phasing out of Tunisia, just defined as a "middle income" country. Thus, AID was trying to provide the CTDA with the budgetary wherewithal to become a credible institution for area development on what was seen, at that time, as a one-time-only basis.

Figure 1

CTRD PROJECT AND SUBPROJECT GOALS AND PURPOSES

A. Central Tunisia Rural Development Project

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:

- Agriculture
- Natural Resource Endowments
- Transport and Communication
- Preventive and Curative Health Services
- Industrial and Marketing Development
- Housing
- Credit and Banking, and
- Local Participation.

2. To increase income, labor productivity, and improve the quality of life for the 200,000 rural Tunisians residing in the CTRD zone.

3. To reduce regional disparities in income levels, quality of life, and access to basic services in Tunisia.

4. To reduce intra-regional disparities in income, quality of life, and access to basic services.

B. Area Development Subproject

1. 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.

C. Small Holder Irrigation Development Support

Optimize small-farmer access to and income derived from agricultural ground water in the CTRD region primarily through infrastructural expansion and secondarily, through diffusion and institutionalization of relevant water management practises.

D. Dryland Farming Systems Research

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.

E. Rural Extension and Outreach

1. Goal: Improve quality of life and income in rural areas of Central Tunisia.

2. Purpose: Effective communications systems established between rural population and public sector purveyors of information and services in such fields as agriculture, health, family planning and other CTRD disciplines.

F. Range Management (Phase I)

1. Goal: Increased real income and improved quality of life in Central Tunisia.

2. Purpose: Improved rangeland and range use practices in Central Tunisia.

G. Range Management (Phase II)

1. Goal: To improve the quality of rural life and real income of the poor majority in the area. The subproject is directed more specifically at the farmer-livestock producers.

2. Purpose: The purpose of this subproject has not changed and is to introduce improved rangeland management and stockraising practices among the livestock producers of Central Tunisia.

(NB: this is not the purpose listed in the original PP as above).

G. Rural Potable Water

1. Goal: Improved quality of life in the CTRD program area.

2. Purpose:

a. Improved access of the dispersed poor in CTRD project area to potable water.

b. Application by CTDA of a rational policy for siting, designing and maintaining rural potable water systems.

c. Test and demonstrate in Central Tunisia lower-cost technologies for providing potable water to dispersed populations.

H. Rural Potable Water Institutions (new project not yet signed in March, 1986)

1. Goal: To improve the quality of life of the rural poor in the CTRD program area.

2. Purpose:

a. Establish and refine a coordinated and decentralized institutional approach to rural water operations and maintenance, with user participation and user fees, demonstrating a model to the GOT which may be appropriate for adoption as a nation-wide strategy.

b. Maximize water investment by improving site selection for new and improved water systems.

c. Provide improved access to potable water for underserved rural populations.

I. Rural Community Health

1. Goal: Improved quality and coverage of primary care in Central Tunisia (including Siliana, Sidi Bou Zid, Kasserine and 4 delegations of Gafsa governorate).

2. Purpose: Restructure non-physician component of primary care and operationalize new system of integrated primary health care delivery in expanded network of facilities.

D. CTRD SUBPROJECTS TO BE CONTINUED POST FY 1986

In advance of this evaluation, USAID/Tunis and the GOT had already made key decisions about continuation of various activities and subprojects, specifically, a new Rural Potable Water Institutions Project, and a revised and extended Range Development subproject. The former will include a component for strengthening the institutional capacity of the CTDA to work with beneficiaries on a participatory basis, as well as creating a system of user-fees. The second clearly abolishes

the coordination role of the CTDA which was included under phase one and replaces it with an inter-agency coordinating committee on which CTDA is represented.

At the time the evaluation was carried out, a decision was about to be made as to whether USAID would finance additional small holder irrigation in Gafsa Nord and/or Sened. In part, this depended on the availability of funds, in part on the results of this evaluation, and in part on AID's decision about whether or not to release credit funds whose disbursement was contingent on improved credit management under the existing Small Holder Irrigation subproject.

Meanwhile, there were strong indications that USAID/Tunis and the CTDA were willing to let the Dryland Farming Systems Research subproject terminate at the PACD, and there were various points of view about the viability of another extension of the PACD on the Rural Extension and Outreach Project. Funds under the Area Development subproject had previously been deobligated, and when the team arrived, USAID/Tunis was seriously considering transferring the remaining \$400,000 in the experimental Fund under this subproject to other projects, pending the recommendations of this evaluation.

The evaluation team was not provided information on the draft CDSS, nor the Mission's action plan. One team member had worked on the draft agriculture strategy during a past assignment, and was thus aware of the general orientation of the Mission toward new project activities in agricultural development. Still, although the scope of work called for the team to make recommendations about the kinds of interventions AID should sponsor in Central Tunisia for the next five years, it was not given the appropriate contextual strategy and budget information on the basis of which to do this with great effectiveness.

As a result of these factors, the team's recommendations for future programming options are based on what we were able to observe in the field, and on data gathered with the help of the CTDA for the economic and social impact analyses. They should, therefore, be taken in that context, rather than being seen as based on a broader analysis of the agriculture sector or USAID's proposed five-year project and program portfolio. With regard to the institutional analysis, however, discussions held during the evaluation at various levels of the appropriate GOT agencies, especially MOA and MOP, made it easier for the team to consider future organizational options for the CTDA in light of the current assumptions being made about decentralization and deconcentration, as well as about regional planning. The

recommendations that are derived from that analysis are thus more closely related to the broader Tunisian reality than may be those for agricultural production interventions or environmental conservation programs.

CHAPTER III

CTDA ORGANIZATION AND MANAGEMENT

A. CENTRAL TUNISIA DEVELOPMENT AUTHORITY

As part of the Government of Tunisia's effort to develop various regions and to provide them with means to enhance the economic participation of the largest portion of the population, the CTDA was set up and made responsible for the development of the whole economic region of Central Tunisia, including the governorates of Kairouan, Kasserine and Sidi Bouzid.

1. CTDA's Purpose

The decree setting up the new CTDA described both the tasks and the intervention area of the Authority. The August 1st, 1978 Decree stipulated in its first Article that "a public establishment of industrial and commercial character, enjoying a legal status and financial self-sufficiency, known as the "Office de Développement de la Tunisie Centrale (Central Tunisia Development Authority) has been set up."

Article 3 states that the general mission of the newly-created CTDA is to promote integrated development in a specified action zone.

"To that end and in conjunction with offices and organizations concerned with development, CTDA has been made responsible for:

a. Encouraging the development of lands on the basis of their production potential and value;

b. Developing alfa-grass cover in order to promote the alfa-grass production sector, organize more rationally the collection of alfa-grass, create and exploit "artificial timbers" so as to meet the country's requirement for cellulose products;

c. Reorganizing and adapting land tenure structures to meet agricultural development needs;

d. Organizing and conducting educational actions aiming primarily at eliminating adult illiteracy, encouraging citizens to adopt family planning methods and helping in establishing professional groupings in cooperation with the appropriate divisions and organizations;

e. Helping farmers obtain needed credit, inputs and services as well as market their farm products;

f. Ensuring that soil and water conservation work is carried out;

g. Seeing that socio-economic infrastructure work is sub-contracted to, and performed by, public, para-statal and private organizations;

h. Contributing to the promotion of non-agricultural businesses through technical assistance in the organizational and management fields and easier access to financing sources;

i. And in general, carrying out all tasks that might be entrusted to CTDA by the Government and aimed at expanding, improving or organizing farm activities within its action zone."

With regard to the diversity of these tasks which include numerous fields, CTDA's efficiency can only be "relative"

CTDA's operations have permitted it to test a wide range of activities that vary from on-farm development to the construction of feeder roads and health centers, and improvement of the rural population's living conditions through the construction of potable water supply points, housing units, rural electricification, and the like.

2. Analyses of Results compared with the Social Purpose of the Activities Achieved

The assessment of the "purpose" set forth in Decree 78-44 as against the results actually achieved or against ongoing activities reveals some differences.

In fact, CTDA has so far never undertaken efforts to develop the alfa-grass cover or to provide in any way alfa-grass production. CTDA has not embarked in any education efforts to eliminate illiteracy and/or to promote family planning. Other institutions are, however, engaged in such socio-cultural activities in the region and are represented on the Authority's Administrative Council. The following table gives a summary comparison between the text of the decree given above and the activities achieved, and suggests some modifications in the "social purpose" of the CTDA's interventions.

Figure 2

Objective as set by
Decree No.78-44

Achievements to Date

Suggestions

- | | | |
|----|--|--|
| 1) | PPIs and surface wells in use; some soil conservation efforts made; some range improvement carried out. Cultivated area has significantly increased. | More attention to economic analysis and private sector initiatives |
|----|--|--|

Objective as set by
Decree No.78-44

Achievements to Date

Suggestions

- | | | |
|----|--|---|
| 2) | None | To be deleted; other organizations are doing it (cellulose). |
| 3) | Tenure problems still exist; other GOT structures have the authority to intervene. | A <u>selective</u> study of land tenure as a constraint to development could be helpful. |
| 4) | Little done so far except water-user associations. | Continue to explore AIC development, carry out cooperative marketing study, foster service cooperatives. |
| 5) | Significant area of action at present. | Decrease CTDA involvement in input provision, including credit:

Carry out marketing studies, including marketing assessment. |
| 6) | Relatively minor interventions. | Design and implement soil and water conservation activities. |
| 7) | Achieved | Continue to encourage private sector contracting for infrastructure construction. |

Very moderately achieved. This area should receive increased attention in the immediate future, but should focus on agriculture-related enterprises.

Not sufficiently specific-
responsibilities Overlap
with those of too many
other organizations/enti-
ties. Revise the text to
specify areas of
emphasis of the CTDA
(see Table)

CTDA's intervention zone was modified by Act No.80-31 dated May 26, 1980 mentioning by name the Governorates of Kasserine, Sidi Bou Zid, Gafsa and Siliana adding that action will be carried out in a "progressive manner"

The law applicable to other development organizations has also been extended to CTDA. This means that there is now some redundancy in the laws and/or decrees dealing with the distribution of tasks among such organizations, especially Act No.78-44 dated August 1st, 1978 and the 1980 Act.

The following table draws a parallel between the various sections of the two Acts mentioned above.

<u>Act No.78-44 of 1978</u>	<u>Act No. 80-31 of 1980</u>
Section 5	Section 1
Section 4 (last point) (non provided for)	Section 2
Section 9	Section 3
(non specified)	Section 4 (1st point) (2nd point)

It would be useful to make these two separate acts into a new and single one, thus combining both production-oriented development activities and the improvement of quality of life which together remain the primary objectives of the CTDA.

Furthermore, laws dealing with CTDA's intervention area, namely Act No.80-31 dated May 26, 1980 amending and completing Act No.78/44, state that "CTDA shall carry out its activities in the Governorates of Kasserine, Sidi Bou Zid, Gafsa and Siliana, adding that CTDA is responsible for the development of PPIs in Kasserine, Sidi Bou Zid, Sened and a part of North Gafsa in addition to Makthar, Rohia and Kesra."

Decree No.345 dated March 30, 1984 has reduced that area in that a special development office has been set up for the Sidi Bou Zid region, adding that CTDA operates in the regions of North Kasserine, South Kasserine, Feriana and Mejev Bel Abbès. This has made the above decree somewhat ambiguous since the latter areas were already mentioned in the 1980 Act. It may be useful to revise the Act so as to include further details as needed, given the present reality.

As things stand now, CTDA is carrying out development activities in Kasserine, North Gafsa and South Siliana although there exist distinct development offices in the governorates of Siliana (Lakhmès and Jerid for the southern regions) and Gafsa. A new delimitation of CTDA's intervention zone based on more clearly defined criteria would better delimit CTDA's area of activity. (It may be noted that the seeming anomaly of including the Southern delegation of Siliana is related to AID's integrated rural development projects in this geographic area beginning in 1976, which were later expanded into the present CTDA action zone.

For the moment, the CTDA will continue implementing on-going programs in its present intervention area; but in the future its planning and implementation areas should coincide and eventually should be coterminous with the Center-West economic region.

3. CTDA's Mandate and Supervising Ministry

The initial six year-phase of CTDA's existence has provided time for the Authority to gain much experience in agricultural development, planning and implementation, and data processing, focused on agricultural development. In addition, the results achieved in the social sector (potable water, electrification, health and rural housing) have been significant. Given progress to date, as well as the recent data from the 1984 census, the governorates in which the CTDA has made its greatest impact are no longer the poorest nor those with the greatest proportion of "poverty pockets". These features are now more characteristic of Kairouan than of Kasserine. Kairouan, which now has its own OMV, was originally mandated an intervention zone. To extend its efforts to the entire economic region, CTDA must consider extending its quality of life interventions in Kairouan and Sidi Bou Zid in ways that will complement, rather than compete with, the activities of the respective OMVS in these two Governorates. Given its broad development mandate, the CTDA should be encouraged to undertake non-agriculture related productive and income generating projects in these two governorates. This is difficult however, for an organization that is under the tutelle of the Ministry of Agriculture, since these kinds of activities are within the purview of the Ministry of Plan. The MOP, however, sees itself as a planning ministry and not an implementing agency and as such cannot take under its control an organization like the CTDA.

The solution which would make it possible to avoid "double control" and shared responsibility would be to arrange for the CTDA and the Ministry of Plan to enter into a convention for the implementation of regional programs such as PDRI and PDR. Thus, CTDA would be a unique organization in Tunisia--under the MOA's control, but also working under a convention with the MOP for the implementation of regional projects throughout the economic region of Central Tunisia.

B. CTDA'S ORGANIZATION AND MANAGEMENT

1. CTDA's History and Evolution

The period 1979-85, which is the period being evaluated, can be divided into two distinct "eras" given the change in 1983 of General Director (PDG).

The period 1979-81 could be divided into several sub-periods:

- Pre start-up period (August 1978 - January 79)
- Start-up period (January 79 - September 83)
- Post start-up period (strengthening CTDA structures) (October 83 - March 86)

a. Pre start-up period, August 1978 - January 1979

This period was mostly used to seek and secure the material and human resources needed for CTDA's central office such as the building where the management divisions were to be grouped, and to select the initial staff needed to man a newly-created organization in an environment that was considered remote, underdeveloped and unappealing. At that time, the various divisions were housed in separate premises pending the building of the CTDA headquarters. Thus, CTDA's efforts were directed toward its own institutional development, and self-definition.

b. Start-up period, January 1979 - October 1983

CTDA was faced with the need to make a choice: must it be only a supplier of services in the region leaving to other institutions the task of project development and planning or, in view of the actual shortage in this specific sector, also assume the planning of projects in the region of Central Tunisia. In fact, as activities were much diversified and as the available means were not always adequate, the problem became how to prioritize the variety of needs expressed by the population.

During this period, while CTDA was still seeking its identity, several actions were undertaken, including under the Area Development Subproject, an agreement with the University of

Wisconsin for technical assistance in the field of regional planning (January 80 - January 81) which provided for the organization of a series of training seminars in Kasserine. The experience was ill-timed since at that point, neither CTDA nor the region nor even the country were prepared to make regional planning a reality. The second attempt was made with Cornell University with the aim of creating a "data bank for the region", or more specifically a "regional information system". The results were rather modest, partly because the data gathering and analysis system were even not fully accepted by CTDA management.

AID stepped in to assist CTDA from the outset and the May 1979 Loan Agreement between these two institutions reflected their shared will to cooperate. During this period, CTDA's work, considering the results achieved, became more focused on agricultural development and improving the population's living conditions than on planning and project design. The Makthar, Rohia and Kesra projects were the first steps on the CTDA-USAID cooperation path.

CTDA's impact begun to be seen in rural infrastructure, in PPIs shallow well construction, fruit tree-planting, the creation of potable water points and construction of health centers (see Chapter IV).

c. Consolidation Phase, October 1983 - March 1986

After the construction of its central office, CTDA delimited its action area and engaged in a number of operations aimed at giving a spur to wide range of rural activities such as agricultural extension and quality of life improvement. Acting in cooperation with CRDA, as well as with such existing regionally represented organizations/programs as PDR, Health, Equipment, INAT, Social Affairs Subdivisions and Génie Rural (GR), etc., the CTDA has been able to assert itself and to provide much-needed support to farmers in the form of credit to purchase farm improvements and agricultural inputs, through an in-kind credit system. The structures installed during this consolidation period should be re-examined and improved, taking into account what has been achieved during the period and the objectives which, although identified as a whole, have not yet been adequately and explicitly described in terms of the short, medium and long-term future.

The following comparative table depicts the most recent growth pattern of CTDA staff.

Source: DAAF

<u>Total Numbers and Distribution of</u>	<u>1984</u>	<u>1985</u>
	<u>318</u>	<u>326</u>
Technical Staff	74	78
Administrative Staff	46	48
Permanent workers	162	164
Workers under contract	36	36

When it was decided that the CTDA's intervention area was to include all of the Governorate of Kasserine, North Gafsa, Sened and South Siliana (AID's traditional action area), the CTDA set up a subdivision in each delegation (administrative district) and regional offices in each governorate, in an effort to bring the field staff closer to the beneficiary population and the relevant local authorities.

2. OTDA's Organization and Management

CTDA has an organization chart^{*/} as proposed in the report prepared by the IBRD consultant team in 1984-85 (see Figure 2). The evaluation team, after reviewing the above proposed organization chart, has suggested the establishment, with the Agricultural Division, of a unit responsible for managing and operating agricultural extension. Its task would consist in helping the farm family optimize the management of its farm in order to earn higher income from farming activities and achieve better marketing for farm products. The training provided through extension efforts should enable the Planning and Evaluation Division to develop a permanent data bank which could be used as a field laboratory for studying farm management and working on its various aspects. Furthermore, as regards the same Planning Division, whose tasks and relationships are discussed below, increased efforts should be made to carry out small and medium enterprise feasibility studies and to emphasize viable private sector opportunities.

3. The Internal and External Institutional Environment

Considering CTDA's purpose, its action area and the means made available, as well as, the results achieved during this past period in various development-related fields, the experience gained by the staff, the potential of the region and present

^{*/} "Rapport de Conception du Système de Management-ODTC", by
M. Frioui

Président Directeur Général

SECRETARIAT

COMITE DE DIRECTION

CONTROLE DE GESTION

D A A F

Mise en valeur

GESTION BUDGETAIRE
ET COORDINATION

TRAVAUX NEUFS
MAINTENANCE

PLANIFICATION
EVALUATION

FINANCE

COMPTABILITE

PERSONNEL
ET
MATERIEL

ASSISTANCE
DIRECTE

A C T I O N
COMMERCIALE

ACTION
DE
VULGARISATION

COORDINATION

BUDGET
D. EQUIPEMENT

ASSISTANCE
ET
CREDIT

MAINTENANCE

ETUDES ET
CREATION

SUVI ET
EVALUATION

ETUDES GENE
RALES LT

BUDGET

TRESORERIE

GENERALE

ANALYTIQUE

ADMI. SOCIAL

APPVT. PARC

Credit en
Nature

Motoculture

Distribution
d'eau

Ecoulement

production
animales
vegetales

Gestion de
l'exploitabilite

Exploitation
d'annees

Coordination
Regionale

Imputation

Suivi

Puits de
Surface

Amelioration et
Condition de vie

Reparation

Renouvellement

Realisation
de projets

Etudes

Enquete

Evaluation

Etudes

...

DIRECTIONS
REGIONALES

SUBDIVISIONS

policy trends, the evaluation team, eager to see the CTDA assume a key role in giving a fresh impetus to development in its intervention area, suggests that the organization chart be revised. Changes are possible that would reflect organizational reorientation better suited to ensure efficient use of the available means, and better programming of actions to be undertaken in cooperation with other organizations existing and operating in the region (see Figure 3). Each of these organizations should have a sort of updated description from the point of view of the CTDA outlining its respective role in project identification design and implementation. Activities then undertaken could be selected with greater rationality in terms of CTDA's institutional environment and competing resources. In view of the need for more relevance in up-coming activities and for more efficient management, the evaluation team recommends greater coordination between the various operators of regional programs. Agencies representing various ministries, such as the Ministries of Equipment, Health, Agriculture, and Interior should confine themselves to an administrative role, that is issuing approval for proposed programs and carrying out technical-financial monitoring activities implemented largely by the CTDA. In so doing, the CTDA will become a more efficient, broader-based implementation organization with more control over the programs it implements. This outcome may be facilitated by the emergence of a new structure, the Regional Development Council, which will be charged with consultative and, perhaps, operational decision-making and project/program approval, including beneficiary identification. This technical committee could be chaired by the CTDA pending the issuance of an Act to formally institutionalize the Regional Development Council.

This pre-Council consultatives committee would be made up of representatives of the various concerned organizations:

- Génie Rural
- Rural Development Program (PDR)
- The Regional Health Directorate
- The Regional Equipment Directorate
- The Regional Farmers Union
- The Destourian Socialist Party and similar organizations.

A discussion of the Planning Division and CTDA's role is included in Chapter III-C. In the light of the above proposals, the Planning Division would be reorganized on the basis of the chart described in that section of the report.

4. Recommendation Relating to Internal Management

To evaluate CTDA's management capacity and practice and to determine what recommendations need to be formulated to improve management efficiency, the evaluation team has conducted two types of observations:

a. A direct study of the management system in its various administrative, financial, budgetary, agricultural, technical and planning aspects, and

b. An indirect study through a review of results of a questionnaire developed and distributed to various CTDA divisions asking respondents to state what problems they have encountered and what solutions they suggest to improve management effectiveness.

The synthesis of surveys has made it possible for the team to make general recommendations and to make known subdivisions desiderata.

5. General Recommendations

Working in a diversified environment and in a wide area, CTDA Management would have much to gain by adapting decentralization and involving subdivision staffs in managerial decision-making and by practising management by exception, that is leaving to each subdivision the freedom to distribute resources as it feels most appropriate within the specific budget allocated to it and in terms of programmatic guidelines, while CTDA's management would reserve the right to monitor assess and amend each subdivision's achievements within an overall plan.

6. Recommendations

In addition to this basic managerial pattern or style, the other recommendations may be summed up as follows:

a. At the administrative procedure level, it is useful and even essential to apply the organizational notes relating to procurement and purchase orders, made in the IBRD consultants' study.

b. There should be a periodic reconciliation of funds allocated, funds expended and those remaining available for each program component, and more coordination between the disbursing office which distributes payments for Title II projects and Title I expenditure items and the accounting office, which changes to capital expenditure accounts amounts used for purchasing Title II-financed equipment and to management accounts, all operating expenses.

Such periodic reconciliation must reflect the regular and rigorous dialogue maintained among three managerial operations of fund allocation, payment, and application to the appropriate accounts, thus meeting the basic requirements for any audits of accounts.

c. Data provided should be made more reliable and accounts should be improved to reflect the true picture of CTDA management, especially by eliminating from the assets side those items which are no longer included in CTDA's partimony and have been transferred to eligible assignees.

d. The patrimonial notion, taken in its strict legal sense, should be applied and a distinction should be made between the elements owned by CTDA and those which CTDA is only managing without having an ownership position.

e. In the balance-sheet, there should also be included special funds of which CTDA is only the administrator, e.g., the in-kind credit account, under a fund-management agreement.

f. CTDA management accounts should be broken down per activity and operating charges divided into three categories of activity:

- profit-seeking activity or remunerated service
- non-profit activity or public service
- commissioned activity or management for a third party's account.

Such practices are likely to rationalize the use of funds for the intended purpose and to justify the level of the required budget allocation and the actual cost, including overhead, charged to various projects.

g. Data should be gathered on the use of vehicles and the consumption of fuel by all the divisions and for CTDA's multiple activities so as to determine the level of operating costs of CTDA's operations in every field (use of data provided by the motor pool).

h. The data sheet (tableau de bord) should be used in the most appropriate way to follow the evolution of activities in CTDA's subdivisions and central offices and to make up the overall synthesis of such activities to determine the future policy and to take corrective actions in appropriate fashion.

i. Project follow-up should be made easier by maintaining an up-dated list of physical achievements while giving attention to the financial status so as to be able to develop in time a composite statement on CTDA's investment activity.

j. A brief report should be periodically prepared on CTDA's operations using for that purpose existing data and the results of the Management committee's discussions. Also, efficient management monitoring should be adopted.

k. As regards in-kind credit: the required summary documents should be prepared, as well as, periodic reports on loan recollection in general, using for that purpose the data sheet (tableau de bord), as well as, loan repayment schedules.

l. Subdivision staff should be invited to attend meetings to discuss the data sheet and the management report in its two aspects (current management and project implementation).

m. Subdivision staff and regional managers should be involved in determining and working out the outlines of the proposed plan. This will make them better motivated and will help identify well thought-out and workable projects.

n. Periodic seminars should be conducted on all CTDA's activities with a view to fully "integrate" the staff and give them a stronger motivation to do their best, to stimulate talents and to prevent the most talented among the staff from leaving for other institutions.

o. The personnel statutes should be revised to take into account the above proposals, as well as, the regulations governing similar institutions (CGDR, ODS, etc..).

C. REGIONAL PLANNING ACTIVITY OF CTDA

1. Present Activities

a. One of the important objectives of the USAID-GOT Central Tunisia project was to establish within the CTDA a Planning and Evaluation Unit (EPU), the purpose of which was:

1. To collect and process the socio-economic information necessary for regional planning;

2. To design projects and to formulate plans for the region;

3. To develop rigorous techniques for project design, monitoring and evaluation;

4. To formulate integrated, multi-sectoral, comprehensive plans for the region.

b. The EPU encountered several difficulties from the beginning. A joint Tunisian/American CTRD Project Evaluation conducted in July 1981 showed that none of the objectives of the project for the EPU was anywhere near being fulfilled. Several factors help to explain the difficulties and the failure to reach the objectives:

1. Tunisian authorities at the central and regional levels seem to have been more interested and more experienced in agricultural development (Mise en Valeur Agricole) than in regional planning;

2. Misunderstandings between American consultants and CTDA Tunisian staff members concerning the decision-making power and administrative autonomy of CTDA, and the political and institutional significance of an economic region in Tunisia, resulted in a lack of communication between the two parties and considerably reduced the impact of technical assistance in that field;

3. The concept of regional planning in the context of a highly centralized administrative and political structure has never been clearly defined nor was the relationship linking all institutions involved in regional project planning, monitoring and evaluation made explicit;

4. CTDA was a young institution operating in a new field of endeavor with a staff often lacking professional experience; it could not develop in a very short time new approaches to planning nor could it modify in the slightest way the distribution of decision-making power between central and regional authorities.

c. Since the 1981 evaluation, the EPU has less ambitious and better-defined objectives, although it appears that additional objectives may be assigned to the Unit which is now called "Direction de la Planification et de l'Evaluation (DPE)". The DPE is presently organized in 3 subdivisions (Services):

1. Service de la Conception des Projets
(project development)

2. Service du Suivi et de l'Evaluation
(monitoring and evaluation)

3. Service des Etudes Générales (general studies)

d. The DPE has 4 permanent staff members and 3 resident technical advisors, one in each subdivision.

e. The Project Development subdivision is restricting itself to identification of micro-projects that can be implemented through the Experimental Fund. It is not involved in project identification and design for the other Directions of CTDA or for the area of intervention as a whole. This responsibility is left to private consulting firms under the supervision of the General Studies subdivision.

f. The Monitoring and Evaluation subdivision started its activities in 1984 by conducting a survey on irrigated perimeters. It cannot be said yet that this unit is conducting rigorous and consistent monitoring and evaluation of CTDA projects or those of the region. Most monitoring is undertaken by the Technical Direction. Post intervention evaluation does not seem to have been conducted at all.

g. The major part of the planning activity is presently undertaken within the General Studies subdivision. It consists in supervising project identification and design activities conducted by private consulting firms, in collecting socio-economic data on the region with the aid of all regional institutions, and in active participation in the VIIth Plan preparation. The activity of the subdivision is presently mainly restricted to the governorate of Kasserine, for the subdivision is still considered to be operating on a pilot level. It seems obvious, from the review of the subdivision's activity, that it has greatly benefited from the experience and professional knowledge of the Tunisian resident advisor. CTDA staff report that the DPE as a whole would greatly benefit from such a contribution.

2. Planning Priorities

It is obvious that regional planning in Tunisia remains to be defined and that the contributions of the numerous institutions operating in this field remain to be coordinated. Tunisia has a very centralized administrative and political organization, and no development institution (CTDA, COGEDRAT, etc.) has real, autonomous decision-making power. (Fig. 3 shows the organizational environment of CTDA.) But concepts, approaches and policy are progressing in a clear direction since 1980, with introduction of some decentralization into decision-making and according a heavier weight to regional programs and projects. It is within this context that the planning activity of CTDA should be understood. Should the limited human resources of CTDA be used for regional plan formulation, even though this might be a futile academic exercise? Or should efforts be oriented to regional project formulation, evaluation, implementation and monitoring? Should efforts be limited to CTDA activity planning, implementing, monitoring and efficiency evaluation? These are not academic questions. The answer to the question of whether CTDA can truly be a model for other regions and can efficiently contribute to reducing regional disparities partly depends on the option chosen.

To answer the definitional problem, one should start from the planning needs that are met by no other institution than CTDA in Central Tunisia. Clear evidence shows that there is presently no regional capacity for project formulation and evaluation or for socio-economic feasibility studies for the increasing number of

regionally-implemented development projects (PDR, PDRI, Programme d'Emploi des Jeunes, CTDA-projects, etc.). Nor can it be reasonably expected that such a capacity will develop in the near future within any other institution than CTDA, including the COGEDRAT which will operate like a regional financing institution. CTDA can thus fill a gap and provide a much needed service for the region.

Impact studies of regional projects and programs are also needed and could be undertaken by CTDA. For example, the evaluation team noted that no studies are being conducted on the impact on production, on prices, on employment, on marketing facilities, etc. of the quickly expanding plantations of fruit trees. The social changes that intensive agricultural activities are producing are not analyzed either, and many other examples could be mentioned to illustrate the need for such studies and for several sectoral surveys.

A third type of activity that appears to be of high priority for the DPE is project monitoring both at the region and at the farm level. A "tableau de bord" was developed in July 1985 at CTDA for the purpose of monitoring the management systems. But nothing similar is presently done in project implementation, and, although the technical divisions are quite appropriately informed on implementation progress, no formal and rigorous system is used for project implementation monitoring and evaluation. As for farms, no data are now being collected on their yields, on their costs, on their investments, nor on their marketing problems, etc. It is obviously impossible for CTDA to keep a record for every farm in its area of intervention, but it can choose a representative sample and define some farm models for the purpose of evaluating the efficiency of its projects at the farm level, of identifying problems to be solved and of assisting farmers to obtain maximum results from this activity.

CTDA can also greatly contribute to the improvement of planning methods. The needs, problems, concerns and aspirations of farmers, and of economic agents more generally, are not taken into account by Tunisian planning procedures. If CTDA succeeds in developing iterative procedures between the farm and the regional levels and between the national sector and the regional subsector, it would significantly contribute to the improvement of national planning methodology. Given the accumulated experience of CTDA and with the provision of an appropriate Tunisian and expatriate senior technical assistance program, the evaluation team believes it possible for CTDA to play such an innovating role.

3. Role Distribution Between Planning Institutions

Several regional and national institutions are involved in regional plan and project formulation. (Figure 4 consists of a diagram of the national planning process.) In addition to CTDA, these are the COGEDRAT, PDR at the governorate level, the regional directions of the Ministries, and all the planning entities at the national level. With the increasing number of regional programs and the growing amounts of financial resources spent on these programs, it becomes essential to distribute rationally the roles and responsibilities between all concerned institutions, especially in Central Tunisia where CTDA objectives might overlap with those of the COGEDRAT.

In light of the planning priorities presented above, the team suggests the following distribution of tasks among the 3 main partners:

a. CTDA: It should play a leading role in the following tasks:

- 1) Regional project identification, design and evaluation;
- 2) Socio-economic feasibility studies of all projects financed through regional programs (PDR, PDRI, CTDA-projects, etc.);
- 3) Impact analysis of regional projects;
- 4) Micro-economic and social data gathering and analysis.

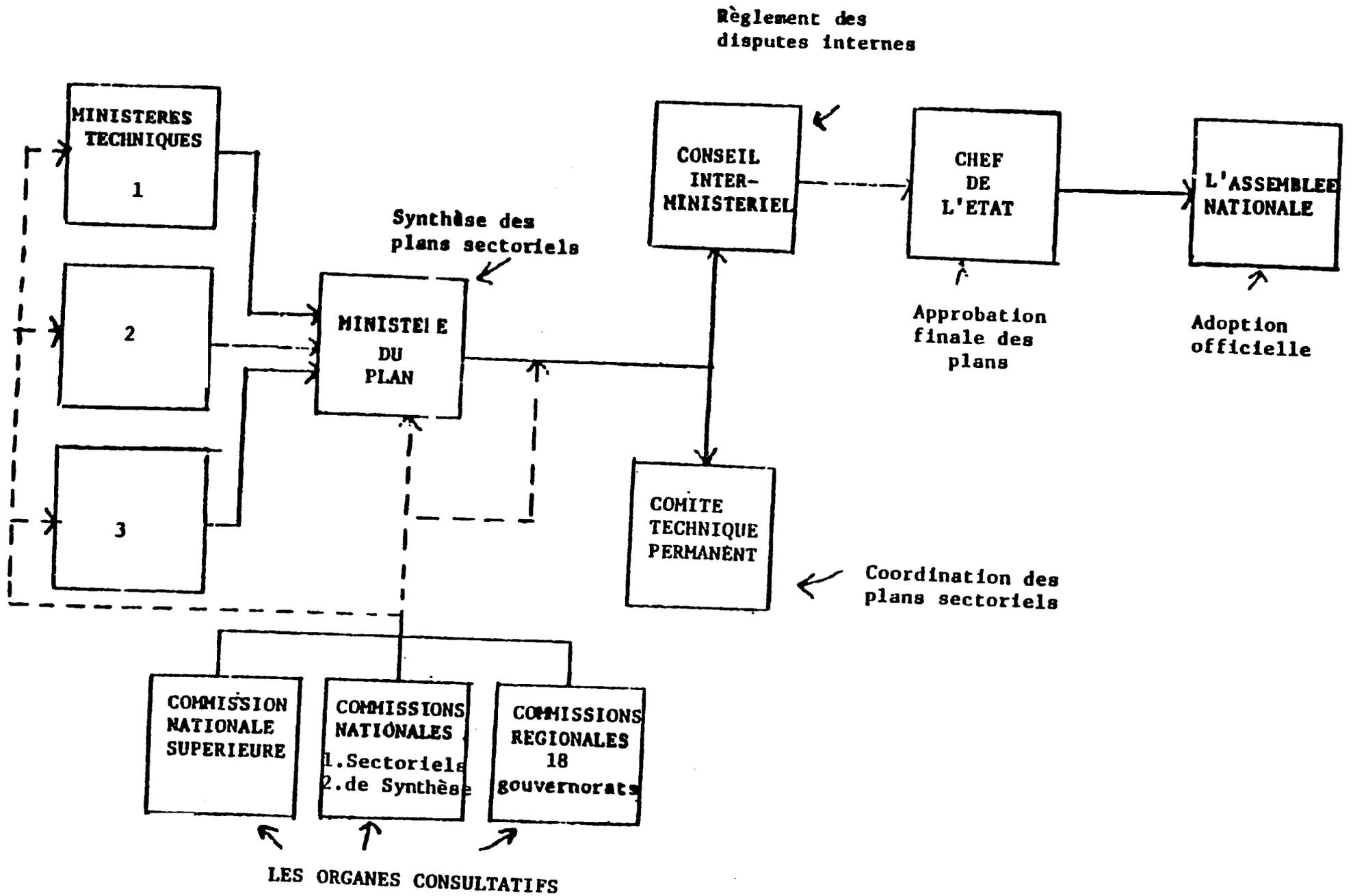
These responsibilities should be given to the DPE in addition to the responsibility of implementation of all regional projects that CTDA should be charged with.

b. COGEDRAT: As made explicit in the law organizing the COGEDRAT, the following tasks are its responsibility:

- 1) Formulation of a global development strategy for the region;
- 2) Coordination of the programs of the several regional agencies;
- 3) Macro-economic data collection in collaboration with the Institut National de la Statistique (INS);
- 4) Urban planning;
- 5) Financing of some rural development programs (specifically the PDRI).

Figure 5:

PROCESSUS DE PLANIFICATION NATIONALE



These are the responsibility of the COGEDRAT and CTDA should not duplicate what is supposed to be undertaken by that institution unless the two organizations clearly and unambiguously agree to do so, and unless special human and financial resources are provided for that purpose.

c. Regional Direction Entities of Technical Ministries (Agriculture, Equipment, etc.). It is the responsibility of the technical ministries:

- 1) To coordinate between regional and national programs;
- 2) To undertake technical feasibility studies of regional projects;
- 3) To monitor technical aspects of regional project implementation.

Here again, there is no justification for CTDA to employ its limited resources in duplicating another institution's activity. Instead, it would be more rational and efficient to benefit from their existing technical staff and resources.

4. Staffing, Training and Technical Assistance Needs

The definition of the role of the DPE of CTDA appears to require a serious reinforcement of the staff operating in that unit, as repeatedly mentioned to the team by both the DPE Director and the Tunisian resident technical advisor. It appeared to the team that DPE needs might be met with:

a. 3 to 4 intermediate-level staff members (adjoints techniques in statistics and agro-economics) for tedious tasks of data collection and treatment;

b. 1 high-level, experienced social scientist for conducting analyses related to beneficiary participation in project formulation and implementation;

c. A good training program for the presently employed staff members defined so as to help them in the accomplishment of their tasks and linked to professional promotion;

d. Tunisian senior technical assistance for medium-term periods (1 to 2 years) provided by Ministries (MOP, MOA, etc.), the University and other Tunisian development institutions with the provision of attractive advantages;

e. US technical assistance in the fields of farm management, economic feasibility and impact studies, and computer science.

CTDA should conduct at the earliest possible occasion a formulation mission for the training and technical assistance components of these recommendations.

D. THE EXPERIMENTAL FUND

A key element in the Area Development project which has encountered a variety of problems over the LOP, is the Experimental Fund. Designed to be obligated in three tranches, initially totalling \$2,800,000, the fund still has available approximately \$400,000. According to the PP, the fund is to be used to assume the direct costs of fully experimental pilot projects within the delegations included in the CTRD project area.

"Such projects will be aimed at testing (a) new technologies (e.g., lower cost potable 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." (p.4).

The 1981 evaluation of the fund, reviewing progress to the goal of 15 projects financed, summarized problems up to that point as of two main types:

"... the difficulties of producing and applying satisfactory criteria for the selection of projects--a problem basically internal to the EPU (now DPE)--and the more striking difficulty of gaining approval for the projects proposed from the Ministry of Plan." (p.7).

The first list of projects was rejected entirely by Plan for reasons only some of which appear to have been directly related to the quality or appropriateness of the proposals themselves. The 1981 evaluation notes that for the Evaluation and Planning Unit (now Direction of Planning, Monitoring and Evaluation) to put together good experimental projects was very time-consuming and demanded a ...

"thorough knowledge of the region, a high set of skills, and a propensity for fieldwork. It is hard to generate such knowledge, skills and attitudes; moreover, the scale of the actions proposed is too small to be worth the effort... In sum, the Experimental Fund action... shows few signs of promise for the future" (p.8).

The "mid-term" evaluation of the Experimental Fund carried out in April-May 1984 makes the point that the CTDA is responsible for the general management of the Fund, and for project selection, but is not--according to the relevant PIL--to design or implement the projects.

"The role of the CTDA is to study, approve projects that are proposed, to monitor their implementation, and to evaluate the results of projects that have terminated so as to replicate those that have been successful. Once the project has been approved, a convention defining the roles and responsibilities of the CTDA and the organization that proposed the project is signed so as to facilitate implementation of the project."

Of 11 projects funded up to that time, eight were designed and implemented by other agencies--Ministry of Social Affairs, MOPH, MOE (Equipment), ASDEAR, etc. However, for two integrated projects "given the complexity of implementing such projects, the CTDA has played a preponderant role in their implementation, monitoring and coordination."

In assessing the impact of the Fund on the DPE, this evaluation indicated that some progress was being made in project identification, although the criteria for project approval made any identification activity difficult. It noted that more effort was required for follow-up and evaluation. As to beneficiary impact, the evaluation noted that Fund projects had had a manifestly positive impact at the beneficiary level, indicated both by income generation and improvements in quality of life, as well as in changes in the "mentality" of beneficiary communities.

In formulating its conclusions, the Fund evaluation team made the point that in fairness, the beginning of Fund activities should be taken to have been from 1982, and as they were evaluating projects only worth a total of 10% of the anticipated funding for 1981-86, the team essentially declined to draw conclusions, except to say that they thought that the program was having a significant positive impact, and corresponded well to the economic and social needs of the region. On the other hand, they noted that project preparation and monitoring could be improved on the part of the DPE, and that the process was taking too much time, first for identification and design, and then between approval and the beginning of implementation.

The team's recommendations were essentially that the Fund should be publicized more widely, including in Arabic, that contracts with other technical ministries should be increased regarding the Fund; that all CTDA senior technical staff should become involved with the activities of the Fund; that the existing approval committee should be changed into a permanent review and monitoring committee, and that a member should come from the

MOP. They also suggested that the service running the Fund should be given more human and transport resources, that an analysis system for completed projects be instituted, and that the geographic coverage of the projects be increased, as should efforts to identify projects with an employment generation component. Finally, the suggestion was made that Fund projects should be well integrated with projects funded from other sources, and that there should be a detailed implementation plan for each project.

The present evaluation team visited a number of completed and ongoing projects in various delegations of the CTDA area, including an "appropriate technology" track, the windmill, self-help housing, a Community Development Foundation rug-making project for girls, a rural latrine, a small mechanics enterprise and the nursery school for children and their mothers. On the whole, there were aspects of these projects which appeared to the team members to be successful, and generally to satisfy Fund selection criteria, while there were other aspects of the same projects that were less obviously appropriate. For example, the latrine visited was clearly never used by the family members, although it was said to be used as a prestige item for guests. Its design was such that, given traditional values about female modesty, no female household member would have been likely to use it under any circumstances.

Similarly, the self-help house visited in Al Ayoun was not being used by the family that had built it, who said that they preferred their gourbi since it was warmer. The family had had one child die from an unidentified illness, and another had had polio. The wife and the children clearly never used the new house, and the husband apparently only used it for sleeping or entertaining on rare occasions.

The windmill at the school, used for watering the children's experimental vegetables worked well, and seemed to be very much appreciated. It is run by the school director, and the head of the Fund program at the CTDA indicated that the demonstration effect had been positive insofar as the private sector company that manufactured the windmill had received at least 15 orders.

Similarly, the mechanic who had received a loan for expansion seemed to be doing well, although the team had no real criteria on the basis of which to judge.

The nursery school, it is widely recognized, does not attract the children's mothers, although there seems to be some competition for places for the children. The underlying assumption is apparently that the children who attend the school will perform better when they enter formal primary school classes (e.g., a "head start" approach). As the Fund manager indicated, however, this has not yet been demonstrated since

such children have not been tested in comparison with a control group of non-nursery attenders. As to the possibility of improving the content of the program for mothers, while it is generally recognized that this should be done, no formal steps have been taken. Also, while it is recognized that mothers are only available at certain times of the year, no particular efforts appear to have been made to take this into account in terms of programming.

The CTDA Fund manager, who is assisted by one other staff member, indicated that the major problem she was encountering was the staff intensiveness of the monitoring process, combined with transport difficulties given the fact that projects are small and widely dispersed. She also was clearly aware of the difficulties posed by the fact that the MOP is not presently interested in contributing scarce foreign exchange--or Tunisian Dinars--to small-scale, appropriate technology-type projects.

On the positive side, as she indicated, those projects that have been funded and implemented have frequently been replicated elsewhere. Thus, the experimental and innovative nature of the Fund has been maintained. Given the CTDA's point of view, the fact that a majority of projects are proposed and implemented by other agencies or entities is a plus. However, the manager recognizes that this approach also limits CTDA's ability to ensure replication of successful projects. It also may put the CTDA in the position of accepting proposals from outside agencies that do not really have anything at all to do with the rest of the CTDA program. Thus, the Fund is not a source of reinforcement for on-going CTDA activities. The exception would be if the studies that are carried out once a proposal idea has been received assist the DPE in improving its project identification and design capability and, similarly, if monitoring and evaluation of the pilot projects under the Fund had really stimulated the DPE to develop and improve its monitoring and evaluation system. This is not presently particularly evident.

So far, Experimental Fund activities seem to be left to the Fund manager and her assistant, although other members of the professional staff are involved from time to time. Yet, the overall impression we were left with, despite favorable remarks by various CTDA staff, is that the Experimental Fund has, for some time, been more trouble than it is worth, and that it is not really contributing to the development of new approaches to project formulation or evaluation within the CTDA as was originally intended. It is not reinforcing other action programs operated by the CTDA--for example it might have been used to pre-test the water-user association concept or the irrigation association concept on an action-research basis. Similarly it could be used to stimulate experimental activities by the CTDA in fostering real service-coop development.

Our conclusion is that aside from the problem of MOP approval, the size of existing and proposed projects is too small in terms of funding level and number of beneficiaries, and that the program is highly staff-intensive. Extension of pilot activities seen as successful, such as the windmill, the track using olive residue, and others has not been notably effective and is essentially beyond the manageable interest of the CTDA. The emphasis in project selection has been on non-agriculture-related activities, which does little to address agriculture-related problems, which are the main area of emphasis of the CTDA. At the same time, the income-generating activities promoted under Fund projects are not innovative, since the selection criteria specifically preclude creation of new enterprises in favor of extending credit to existing and successful enterprises. This is based on the idea that other agencies are providing for new enterprise creation, which is true, but should not preclude the CTDA from fostering some innovation, for example in marketing.

1. Recommendations

Devise means to make the Experimental Fund effective or close it out. Some of the measures that might make it more effective include:

a. Reverse the assumption that the CTDA should not be involved in design and implementation of Fund projects, if necessary with a new PIL.

b. Increase the potential size of projects to extend coverage and decrease staff-intensity, while meeting the present orientation of the MOP.

c. Recruit to the CTDA, or identify outside it and contract for project design professional services. Qualification for such individuals should include knowledge of the region and creative/innovative talents.

d. Use the Experimental Fund as a laboratory for agri-business and marketing-related income-generating activities; evaluate these closely and provide resources for the replication of proven approaches.

e) Insure that criteria and mechanisms are identified on the basis of which a pilot activity judged successful will be replicated.

f. Refrain from funding pre-designed projects from PVOs or other entities that have largely a social welfare orientation, and that do not conform to the overall project selection criteria of the CTDA.

Of these we think (d) is potentially most important and relevant to the income oriented priorities of the Central Tunisia Program.

CHAPTER IV

SOCIO-ECONOMIC IMPACT

A. BACKGROUND

In examining the economics of the Central Tunisia Development Authority (CTDA) activities and interventions the team has focussed primarily on direct costs of individual interventions. The percentage which indirect costs have been of total resources in the past would not be representative of the likely indirect costs relative to total resources in the future. The main concern is the economics of future operations. Like most new organizations, CTDA incurred substantial start-up costs before it began to produce results and production has been substantially constrained to date by requirements for development of staff, new procedures, the design and analysis of interventions and delays as the various parties reached understanding about approaches. Costs of technical assistance and training of CTDA staff abroad were particularly heavy in the first years. With most of that behind them, CTDA should be able to show an improvement in the percentage of total resources passed on to final beneficiaries.

Overhead costs of CTDA net of these early start-up expenses have been estimated and considered part of the activity costs. Thus, in general, this approach includes the direct financial contribution but not the direct costs of other agencies that play a role in the implementation of the program.

The proposals which the team has made for redirection of CTDA operations, if adopted, should result in further improvements in the CTDA contribution to development of Central Tunisia though they may not increase the percentage of total CTDA programmed resources which are received by final beneficiaries. These recommendations include:

A sharp reduction in the future in expatriate technical assistance and training abroad, particularly long-term participant training.

Greater use of on-the-job training and carefully tailored short-term TA, through which CTDA should be able to make more efficient and effective use of its limited professional staff. Due to the overall GOT budget crisis, it is unlikely that the CTDA will be allocated substantially increased staff ceilings. Thus, more will have to be done by those already on board, and more use may have to be made of contractors from the private sector for clearly-defined studies and other analytic tasks.

That the CTDA maintain the implementation functions it presently carries out in the 17 delegations of three governorates -- Kasserine, Gafsa and Siliana, but also have the project

identification, design and evaluation responsibilities in the Gafsa and Siliana delegations that it currently has in Kasserine. Further, that for Kairouan and Sidi Bou Zid, the CTDA begin to identify and design non-agricultural interventions, since these are presently beyond the mandates and capabilities of the respective OMVs in those governorates. The objective over five years or so is for such CTDA activities to be carried out throughout the economic region of the Center-West.

- o Concentration on a narrower set of functions, which would permit the number of divisions and subdivisions to be reduced and operational savings thereby achieved.

Partially offsetting possible savings, greater costs would be incurred in connection with the new broad range of non-implementation activities and larger geographical area.

1. Total Resources

Data supplied by CTDA indicate that the total resources made or to be made available for the Central Tunisia Development Program are the equivalent of US\$76,117,000 (see Table 1). The GOT accounted for \$50.5 million, AID \$18.7 million and IBRD \$6.9 million. These data indicate clearly the high priority that the GOT has attached to Central Tunisia development in use of its own resources.

The total project assistance obligated by the USAID is shown in Table 2 with project activity completion dates of individual activities. In general, the distinction between grant and loan funds reflects the use made of the money. Thus loan funds are primarily to finance direct support of development activities, e.g. financing of surface wells, PPIs and potable water. Grant funds are largely for expatriate technical assistance, training abroad and some imported commodities (e.g. drilling rigs for potable water, visual aid equipment for extension, vehicles). These, largely start-up, costs are expected to end with the PACD. Hence, in considering the benefits/costs relationship as a basis for future decision-making, these costs should be excluded, though they do, of course, bear on the benefits/costs relationship of the past.

Discounting these high early dollar costs of starting up, it is estimated that about 15% of total funds go to pay internal operating costs and 85% go to beneficiaries in the form of surface wells, PPIs, demonstrations, dryland range improvement, potable water, health centers, etc. Thus, on average, total costs of individual interventions would be about 17.6% higher than direct costs. Assuming these data are reasonably accurate the relationship of overhead to resources appears quite favorable compared with most organizations. Details of some of the specific interventions for 1980 to 1985 with beneficiaries are presented in the following section.

Table 1 - Total Funds as Reported by CTDA

<u>Programmes</u>	<u>Contribution de l'USAID en '000\$</u>	<u>Contribution Tunisienne en '000\$</u>	<u>Contribution BIRD en '000\$</u>	<u>Total en '000\$</u>
<u>TUNISO-AMERICAIN</u>				
Développement Zonal	3,378	2,700	--	6,078
Développement de l'irrigation	4,535	2,483	--	7,018
Agriculture en Sec (1)	2,800	2,730	--	5,530
Eau Potable	2,190	1,776	--	3,966
Vulgarisation	2,805	3,570	--	6,375
Santé	3,000	2,600	--	5,600
<u>TUNISO-BIRD</u>	--	8,914	6,918	15,832
<u>TUNISIEN*</u>				
Complémentaire	--	6,610	--	6,610
Deux Délégations (81) 4,850		--	4,850	--
Quatre Délégations (84) 1,858		--	1,858	--
Vulgarisation dans les PPIs 1,200		--	1,200	--
Fonctionnement		11,200	--	11,200
TOTAUX	18,787	50,491	6,918	76,117

(1) Contribution du GOT de 1979 au 31/12/85

*Non-compris le financement tunisien dans les délégations de Sidi Bou Zid

Importance du Financement:

1. Tout le Programme:
 - Tunisien 66 %
 - USAID 25 %
 - BIRD 9 %

2. Sans le Programme BIRD:
 - Tunisien 69 %
 - USAID 31 %

Source: CTDA, Kasserine

Table 2 - USAID Loan and Grant Funds
Obligated Through July 1985
to Assist the Subprojects

<u>Subprojects</u>	<u>Amounts obligated by the Agreement as amended to date (in millions of dollars)</u>			
	<u>Loan</u>	<u>Grant</u>	<u>Total</u>	<u>PACD</u>
Area Development	-	3.378	3.378	30/9/87
Dryland Farming Systems Research	-	2.800	2.800	30/9/86
Small Holder Irrigation Development	4.135	0.400	4.535	30/9/86
Potable Water Systems	0.750	-	0.750	30/9/86
Rural Extension and Outreach	2.805	-	2.805	30/9/86
Rural Potable Water	1.500	0.690	2.190	30/9/86
Range Development and Management	2.915	2.685	5.600	30/9/89
Community Development PVO	<u>-</u>	<u>0.437</u>	<u>0.437</u>	30/9/87
Total	12.105	10.390	22.495	

B. COST PER BENEFICIARY FOR PRINCIPAL INTERVENTIONS

Data on number of beneficiaries and costs per beneficiary are more adequate for Kasserine Governorate than for the other 5 delegations.

Therefore these data will be used as the principal basis for estimating costs and benefits. Data on the 12 delegations of Kasserine are shown below for 1980-85:

Project Costs per Beneficiary

Intervention	No.	Estimated Costs (TD)	Estimated Number of Beneficiaries	Cost per Beneficiary	
				Direct (TD)	with overhead (TD)
Potable Water	35	1,790,000	65,600	27.54	32.5
Basic Health	28	1,515,009	45,057	33.62	39.7
Electrification	12	397,000	2,382*	166.67	196.7
PPI		3,364,000	3,036*	1108.04	1307.0
Surface Wells		3,539,600	7,986*	443.23	527.0

Source: CTDA Records on Kasserine Governorate

*/ These numbers of beneficiaries are based on an estimate of 6 people per family with 397 families benefiting from electricity, 600 from PPIs, and 1331 from surface wells. In the case of surface wells and PPIs there will be substantial numbers of indirect beneficiaries from increases in farm employment and from increased marketing of produce and supply of production inputs. Electricity also may result in some productive and secondary economic impacts.

In considering costs per beneficiary in irrigation, it should be borne in mind that irrigation also provides potable water. Adjusted for this contribution, the direct costs per person for irrigation would drop to about 410 TD for surface wells and 1075 TD for PPIs. The direct project cost per hectare for surface wells was approximately 1,330 TD and for PPIs it was approximately 4,100TD/ha. The FOSDA subsidy and self-financing of the farmer would bring this to about 1,800 TD. Adding 17.6% overhead would bring the totals to about 2000 TD/ha for surface wells and 4800 TD/ha for PPIs.

The table below shows progress up to 1980 and results since in terms of increase in number of beneficiaries (and ha for irrigation). The data indicate largest percentage increases in Kasserine in numbers of rural people serviced by potable water (119%) and surface wells (165%) and surface well area irrigated (230%).

Progress 1980-1985

	Pre 1980 Situation		Additions in 1980-1985			
	No. of Beneficiaries	Area (Ha.)	No.	Increase %	Ha.	Increase %
Potable Water	58,070	-	65,000	111.9	-	-
Basic Health	236,014	-	45,057	19.1	-	-
Electricity	10,320	-	2,382	23.1	-	-
Surface Wells	4,830	805	7,986	165.3	2,660	330.4
PPIs	6,813	4,665	3,036	44.6	820	17.6

Source: CTDA records

In comparison with the other interventions, surface wells offered substantial advantages. They provide economic benefits at least comparable to PPIs at one third of the initial project cost per beneficiary and they leave the Government free of further responsibility for operation and maintenance.* Further efforts can increase the number of beneficiaries per well and increase hectares served per well thereby cutting cost per beneficiary substantially. While surface wells are substantially above non-income-producing interventions in costs per beneficiary they provide a potentially high rate of return compared with the investment. IBRD analysis of all past irrigation investment and resulting increase in production showed a 20% gross return on investment after allowance for major cash production outlays. Returns per dinar invested in the Central Tunisia program are 2 to 3 times as high for surface wells as PPIs which typically have been the main focus of GOT irrigation investment. Surface wells compare favorably with past total investments in irrigation as reported by the IBRD.

1. Ratio of Beneficiaries to Total Candidate Population

The team was unable to obtain precise information on project and subproject beneficiaries so as to assess the exact impact of CTDA projects. However, about 30% of the Kasserine Governorate rural population has been reached by the CTDA potable water project and almost as many by the rural health project. Thus, the total percentage reached would be about 60% if each household benefited from only one of these two projects.

*/ Adding FOSDA subsidies and self-financing would increase surface well costs by a third and bring average investment costs per hectare to about 45% of the PPI's.

The production projects reached an estimated 5% of the rural population; while the percentage of overall arable land affected by project activities was small, the production impacts will be large because of the much higher yields and value of production per ha. in irrigated areas. The total population reached is small by comparison with the two activities listed above, but performance is good in comparison with other projects of this type observed elsewhere.

C. COSTS AND BENEFITS OF DIFFERENT INTERVENTIONS

1. Potable Water

The potable water sub-activity had as its initial target the development of 16 springs, lining and motorizing of 10 surface wells and drilling and developing of 90 tube wells. Actual achievement is expected to be 16, 11 and 14 respectively. The major reason for the discrepancy has been that development of drilled wells has exceeded initial cost estimates by a factor of about 5. The initial plans called for some hand pumps but during implementation, several changes were made including fitting all drilled wells with motorized pumps and cisterns. In part this was designed to permit a given pump and well to serve larger numbers of people and livestock. Though exact figures are not available on numbers of families served by each well, it has been estimated by CTDA project personnel that the total number of people served will be about 64,000 which is about 25% over the original target.^{1/} Thus, the capital cost per person served with potable water is about \$60 (33 TD), (18% more with administrative, technical assistance and training); operating costs were reported to run in the \$2 to \$5 per capita, per year range. Capital cost at the LIBOR interest rate and amortization of the facilities over 10-20 years would add about \$12/capita/year. Capital and operating costs currently are borne by the Government.

However under the new proposed potable water project, plans are underway to form user associations which would assess and collect charges for water from users and use the fees collected for operations and routine maintenance of the facility. The Government would thus be relieved of financing the estimated \$2 to \$5/capita/year operating and maintenance costs which would be paid by users. Major maintenance costs would still be borne by the

^{1/} USAID estimated total beneficiaries at about 50,000 based on an average of about 1500 users per well which is much above the PP estimate for users per well; one of the basic papers for the original design cautions about the tendency to over estimate numbers of beneficiaries. There is, of course, the question of point in time when estimates are made. During the dry season it was reported that 3 times as many people used the water compared with the wet season.

Government. One PVO (Save the Children Federation) reportedly has already developed and implemented some potable and irrigation water operations where users in associations bear operating and minor repair costs.

Several types of benefits have resulted from the provision of potable water through the sub-project:

- o Time saved in carrying water to the household. In general it was calculated that each facility would serve an average of 1500-1800 people within a radius of 4 km. (Sources: Rural Potable Water Institutions Project Paper, page 6 and CTDA supplied data.)
- o Reduced incidence of water-borne disease and infection.
- o More adequate, more accessible and better-quality water for livestock which will have a direct impact on animal productivity.
- o Aesthetic and other non-monetized benefits of clean, clear, cool water sources for drinking and other household uses.

As a partial offset to the benefits, some people may find themselves traveling farther to obtain water from these new systems and in some cases, the new source may have a higher content of undesirable minerals.

With respect to the proposed new project, whereas before most water consumed probably was free in a monetized sense, now a fee will be assessed. It would take much more time than the team had to collect needed data and estimate the monetary value of any one of the types of benefits listed above, associated with the development of new water systems. It does seem intuitively obvious that at a total cost of \$14-17/capita/year, including capital amortization, the return relative to the cost should be quite acceptable. However, given the low level of per capita income in the region (a typical dryland income of \$60/year per capita was noted in the CTRD PP, page 21), a typical low-income family well might see it differently if they were given the choice of continuing to use the old water system with an annual grant of \$15/capita or the new system free. But then such a family likely would not know, much less be able to monetize, the full health value alone of contaminated versus uncontaminated water.

A range of benefits may accrue from this new project. Some beneficiaries may shift from purchase of tanker-hauled water at relatively great expense to water hauled by family labor from a shorter distance. Other beneficiaries may be freed from water hauling to pursue other productive tasks. However, given the

employment situation in the region, there may be no alternative, gainful employment available to many people whose time is thus freed up. On the other hand, where women are the primary haulers of water, and there is reason to believe that they now work long hours, some of the time freed is likely to be used on productive activities.

The New Potable Water Institutions project proposes to spend some \$9.9 million equivalent to serve approximately another 50,000 people. The direct costs of the facilities are expected to be about \$6 million. Institutional development and other costs for the formation of water user associations and other objectives is expected to take another \$3.9 million. This would suggest per capita (interest and amortization) cost per year of about \$20-24 and a total cost with O&M probably of \$25-30 per capita/year. If some of the lower estimates on per capita income for dryland farm families are correct, there is a serious question about the balance of that total income and the annual per capita expenditure for potable water. And, of course, amortizing the total project cost of \$9.9 million over 50,000 people would raise the capital cost to \$198/capita and annual costs to \$30-40/capita/year.

The economic analysis section of the PP has suggested that since economic valuation of benefits is difficult or unfeasible, the economic analysis should only be concerned with finding minimum costs means of supplying potable water. The evaluation team finds this conclusion somewhat inadequate, especially in view of the failure of the project to find the low cost approaches it had predicted it would find. The question may be moot since it appears that the GOT is determined to make "potable water" generally available. But the question must be asked as to how far down on population groupings or high in cost per person it is prepared to go.

2. Public Health

The Government of Tunisia places high priority on providing some level of basic health facilities throughout the country. The cost per beneficiary for facilities and equipment of about \$60/capita, in these days of sky rocketing costs of health observed in developed countries, is in itself very impressive. There is a general consensus that CTDA has been able to construct and equip facilities much more rapidly than would have been possible under Ministry of Health procedures. Given the rates of inflation, that in itself would lead to considerable savings in nominal dinar terms. But it is the total investment figure itself of 33D,600 per beneficiary that measures CTDA's contribution in the health area and the rapid increase in benefits in the rural areas where population density is lower and consequently costs normally would be higher than urban areas. There will, of course, be a continuing cost for operation of these facilities borne by the Government which is not basically a part of CTDA current or future

responsibility. The benefits of improved health facilities including family planning services are difficult to monetize and certainly the team in the time it had could not contribute to efforts to establish monetary values for health and family planning services. Annex D discusses some of the social impacts of better health care. The team is prepared to accept that at costs incurred, the CTDA has made a cost effective contribution to health and family planning services in rural areas of Central Tunisia.

3. The Agricultural Projects

The AID approach in its choice of sub-projects for agricultural intervention has aimed at a balance between irrigation and dryland with the Small Holder Irrigation Subproject directly assisting the development of irrigation and the Dryland Farming Systems Research and the Range Management Subprojects concerned with rainfed agriculture. Embracing both systems was the Rural Extension and Outreach Subproject which, as might be expected for intensive agriculture, put most of its emphasis on irrigated systems but covered also some dryland farming. There was also a complementarity in this last project with the CRDA extension service.

Agricultural interventions under the project have been concentrated on irrigation with surface wells providing about 75% of the increase in area irrigated. The surface well program appears to have been the most successful to date. Within the irrigated area, the primary production emphasis has been vegetables for the short-run, with fruit trees planted over a large area and expected to be the principal source of income after 4 to 6 years. The dryland projects have had very limited impact on the CTRD project area up to the present time.

The economic and social impacts of production interventions are discussed briefly in this chapter and recommendations presented. The economics of these interventions are discussed in more detail in Annex B.

a. Shallow Wells

Shallow wells tend to be fairly uniform in diameter (about 2.5-3 meters), construction, pumping and cistern layout. The major differences in cost per unit of water were related to the depth to water and the rate of flow. Most of the shallow, hand dug wells are between 15 and 40 meters deep, lined with masonry, and have a flow sufficient to intensively irrigate about 2 hectares of mixed fruits and vegetables. One well visited was only 9 meters deep and had 7 meters of water in it. One farmer had two wells, of which the one on the lower level irrigated some 7 hectares, mostly in trees. Some farmers were irrigating less than one hectare of land with their shallow wells. Costs are a function of depth but

those most recently constructed cost 6,000 to 8,000 D including pump, cistern and conveyance systems. Some were as low as 5,000 D and some as high as 12,000 D. In 1983, the project evaluation reported typical costs of 3,500 - 4,000 D. Inflation and the devaluation of the dinar would account for most of this difference.

The amount spent on land leveling and fitting of fields for irrigation varies widely depending on the slope and irrigation methods employed. At the lower extreme with reasonably level land and hose pull or drip system, the cost of leveling is virtually zero. The other major investments in connection with the irrigation are planting trees in the case of fruit operations and establishment of greenhouses which are common in connection with vegetable production.

In late 1985, Tom Cusack of OSU assembled data on surface well costs. Cusack's data suggest total cost per m³ for surface well irrigation water ranging from 30 mm to 92/m³ from low depth (10 meters) and from 97 to 480 mm/m³ for wells deeper than 40 meters. These differences are based on flows of 5,000 to 80,000 m³/year. Our data showed somewhat smaller differences between well depths in total costs and somewhat higher costs for shallow wells when all costs, including cisterns, pumps, pipes and pump houses are included.

The most common irrigation approach using surface wells has been ditch water delivery with application either in small basins or by a furrow system. Several measures which offer major potential for water savings and increase in benefits and number of beneficiaries have been tested. Some of these are in use on private farms (use of plastic pipes and hoses to apply water in small basins, drip irrigation, supplemental rather than intensive irrigation, different choices of crops, etc.).

The results to date indicate that savings with improved distribution and application systems will permit an increase in area of tree crops irrigated of about 2.5 fold with an increase in investment of about 400 TD/ha. Total costs per hectare of trees irrigated drops by nearly 50% when such improvements are introduced.

Much of the economic justification of the irrigation has been predicated on rather optimistic assumptions concerning prices of fruits especially apples, pears and peaches - most of the newly irrigated land is being planted to these types of fruit trees. The 1983 evaluation raised questions about the realism of the assumptions on the fruit prices and the current team repeats this concern. During the period from 1983 to 1986 expectations on prices have dropped slightly in real terms but still seem unrealistic in terms of world prices and prospective increases in production. It is notable that fruit production over the past decade has been growing at about twice the rate of population

growth; reported numbers of new trees are about twice the reported number of mature trees, and plantings continue at a rapid pace. In recent years vegetable production has been growing at about the same rate as population. Vegetable production has at times exceeded demand, at least in Central Tunisia, and prices have been quite depressed. There is substantial evidence that farmers do respond quite readily to price changes by adjusting vegetable areas planted, but adjustment will be more difficult and costly for fruits.

Data on the potential profitability of irrigation in general and of surface wells in particular are scarce. Data from several limited sources were assembled and compared: a) team visits to farms, b) before and after intervention data prepared by CTDA on 25 farms, c) Ministry of Agriculture and IBRD cost and return estimates for other areas, d) overall estimates of irrigation costs and return for Tunisia, e) experiment station data and GOT estimates of yields on irrigated land. Data on apples, pears and peaches, the major Central Tunisia thrust, are almost non-existent.

Prospects for profits depend largely on the choices of crops and their prices, the irrigation system used and quality of farm management. Using local production and price assumptions, fruits are clearly most profitable. Typically extension personnel and farmers expect over 40 kg per apple tree and prices of about 500 mm/kg for a gross of 6,000 TD/ha/year. One large farmer visited said he expected over one dinar/kg and over 100 kg per tree, which would be over 25,000 TD/ha. CTDA in its planning has used yields of 12 MT/ha for mature apple and pear trees and 6 MT for peaches. At prices of 500 mill./kg that would be 6,000 TD gross per hectare for apples and pears (3,000 TD if prices were to fall to half this level which still is attractive relative to most alternatives).

In contrast estimates for vegetable crops grown without a greenhouse (that is, in season) might go as high as 5,000 TD but are likely to be lower on most seasonal vegetables. Returns would be considerably higher on off-season (greenhouse) vegetables but greenhouses cost about 15,000 TD/ha and require large expenditures for replacement of the plastic every three years. Given the costs and management difficulties, greenhouses should be restricted to a few farmers with good market contacts and good management.

In general, reasonably good irrigation management and marketing is likely to result in acceptable returns to surface well irrigation. Illustratively, IBRD estimated 20% return on over \$600 million past irrigation investment in Tunisia. Most of the public investment has been PPIs. The experience in Central Tunisia shows lower costs and higher returns with surface wells than either past experience in Tunisia or PPIs in the Central Tunisia program.

CTDA prepared model farm plans for 1.5 and 4.0 ha irrigation

units. These analyses conclude that the highest rates of return are with cold season irrigated vegetables which have low water requirements and summer forages which command high prices (both about 1200 TD/ha). Next are fruit trees and winter forage (about 1000 TD/ha). Much lower profits were expected from summer vegetables and irrigated cereals. Dryland tree crops are lowest of the alternatives considered, but involve the least investment relative to gross returns. In general, these irrigated crops will provide sufficient return to cover irrigation water application and other cash production costs and return a reasonable wage to family labor under good management. Obtaining a market rate of return on the capital outlay will require good management.

Evidence from 25 farms on which data were assembled during the evaluation indicates that some farmers do possess such management skills and are well able to achieve good returns on a variety of crops. Some of the most successful were farmers who were experienced in cropping and had prior experience in irrigation. However, some with no prior irrigation experience appeared to be doing well also. Contrary to expectations, some of the highest returns among the farms on which data were obtained were from irrigated forage (oat-vetch). There is an estimated 25% forage deficit in Kasserine in a normal year. The specific vegetables chosen, market prospects and yields are key factors in vegetable profitability.

The following table shows the distribution of families by income classes before and after the intervention. (Note: The classes are not the same for pre-intervention and post-intervention.) Farm income includes income from labor used on the farm.

Number of Farms by Pre-Intervention Income Class

<u>Class (TD/Year)</u>	<u>Farm Income Only</u>	<u>Farm Plus Other Income*</u>
Under 40	1	
41 - 100	1	
101 - 300	7	
301 - 500	1	
501 - 1000	3	3*
1001 - 2000	4	1*
over 2000	1	2*
	==	=
Total	18*	6*

*/ This represents a double counting since these 6 families also are shown in the previous column for farm income only. Farms where data were too weak to draw conclusions are not included.

Post Intervention Income Exclusive of Irrigation
System Amortization Cost

<u>Class (TD/Year)</u>	<u>Number</u>
Under 500	1
501 - 1000	3
1001 - 2000	4
2001 - 3000	4
3001 - 5000	1
5001 - 8000	4
over 8000	0
	==
	17*

All farms had young fruit trees but as yet sales of fruits were virtually nil. Hence benefits (income) were derived largely from interplanting of trees with vegetables, forage and cereals and from livestock. The most significant conclusion that emerges from the survey is that a) major increases in income have been achieved before the trees started bearing, b) labor use on the farms has increased substantially and off-farm labor declined (e.g. two families previously harvested alfa grass), c) given the typical investments made, most of the farmers should be able to pay their irrigation loans if they are rescheduled (at least 9 of the 17 and probably 13 of the 17). The others may need to improve their operations or await large hoped-for income increases from fruits.

In general, data assembled by the MOA and IBRD verify the above conclusions. These data showed the highest returns for watermelons and intensively irrigated potatoes (about 1500 TD/ha in 1986 dinars with full water cost assumed). Green onions and peppers showed net returns of about 500 TD/ha (same basis). Tomatoes about covered the full cost of water, labor and other factors. Each of these crops offered the opportunity to sell large amounts of family labor. The costs of water from an average cost surface well which is being used to irrigate 2 hectares, 2 seasonal crops per year would about equal the 1979 figures of 32 mm/m³ used in these calculations. Evidence indicates surface well operations provide higher than average output per unit of water. These data thus substantiate the conclusion that surface wells are basically sound if well managed. Net returns found by IBRD for vegetables under plastic were much higher (3,000 to 7,000 TD in current TD value), but for reasons suggested earlier these should not be generally recommended (high investments, management required and risks).

* / Data on some farms were inadequate to estimate returns.

The evidence suggests that supplementally irrigated cereals (200mm) can produce a sufficient marginal return above marginal costs to pay their share of the irrigation investment. On average it will require an increase of 8-9 qx of wheat plus straw to pay for full costs of surface well water and fertilizer. Use of irrigation water in periods of otherwise slack use (after summer vegetables and before the start of winter vegetables) where only marginal costs have to be covered would require only about 3 qx extra grain plus the straw. In contrast, increases in yields of 12-20 qx of grain over a typical 3-4 qx were reported. This level of increase or greater is verified by comparison of yields in areas of 225 - 250 mm and those of 425 - 450 mm of rainfall.

Returns are likely to be substantially enhanced where water saving techniques are applied to reduce total costs. Illustratively, water costs for an average irrigated hectare (8000 m³/year) would be about 1000 TD. Costs can be reduced to about 550 TD/year when water saving techniques in tree crops are used and the water saved is spread over an additional area of similar tree crops.

Supplemental irrigation to start basically dryland tree crops appears to offer the potential for even higher returns on surface well investments, e.g. pistachios and almonds where donkey and a tank cart are used for water distribution. While this requires more field testing, it appears feasible thus to spread water over as much as 20 times the area compared with situations where intensive irrigation is practiced. Land may then become the limiting factor.

Data are too varied to draw a blanket conclusion on overall rates of return from surface well investment. Some farmers undoubtedly will fail, but it clearly is economically feasible to pay costs of the investment and provide a substantially improved level of living where good judgements are made on crop choices, marketing and risk reduction. The rates of success can be substantially improved by extension advice which helps the farmer to treat his farm as an economic unit, diversifying where appropriate, combining complementary and risk reducing enterprises and where measures are taken to expand and reinforce the market for perishable commodities by, for example, increasing cooperatives and other private sector market participation.

Better market information also will be important in improving farmer crop and livestock choices and improving operation of marketing firms. Farmers will need good technical guidance on improvement in water management to obtain the maximum return per unit of water applied. CTDA is looking at ways to increase production and income from available water, not just increase yield per hectare of land.

Available data and observations made in the field do indicate that some surface wells have greatly increased value of production per hectare - in many cases an estimated 100 fold. Better farmers are

making good returns above investment and variable costs using surface wells - mostly as a result of wise crop and market choices. Thus it clearly is possible. Essentially all the farmers have gone heavily into tree planting as soon as they had irrigation water. This has increased financial outlays above irrigation costs and reduced income in the short run. As a result many appear to be in considerable financial difficulty. The short (12 months) grace period on USAID financed surface well loans has exacerbated this problem. About 80% of the surface loans are in arrears on payments. The potential for these farmers in difficulty to recover exists, but more whole-farm based technical assistance, rescheduling of loans and help in marketing will be needed.

Economic and social prospects are sufficiently favorable that the team does not hesitate to recommend continuation of the surface well program in new areas, but approaches noted above to reduce risks and improve prospects should be incorporated and the system for managing credit requires improvement. More farm level study of actual experience is needed to guide future programs.

b. Public Irrigation Perimeters

As noted earlier, in general PPIs cost about twice as much per hectare irrigated and productivity is reported to be generally lower. The rates of return relative to total costs are quite questionable. The economic prospects for the individual farm family appear brighter under the PPI than under the surface well program. This is because the Government bears the total investment costs and much of the cost of maintenance and operation. In general, farmers pay about 10 mill./m³ which is only about 30% of the current cost of PPI operation and about 15% of total costs.

Blessed as they are with the much smaller costs, PPI farm operators clearly should do much better financially, at least in the early years. Most of the crops they might plant including irrigated cereals, forages and lower value vegetables should prove profitable, especially if one considers the opportunity cost of labor. This means unfortunately that they may feel less urgency to improve water use efficiency and yields and to optimize crop combinations. The result is that the economics of development of the PPI form of irrigation which already was marginal become even less sound, and prospects for improvement become more remote. At the same time the Government, already having made a large investment, is saddled with a large continuing liability for operation of the PPIs at a substantial subsidy. Some progress reportedly has been made by CTDA in getting water charges raised, thereby reducing the subsidy liability and increasing incentives to improve water use efficiency.

In the absence of such changes it is possible that, if all goes well in fruit marketing and prices stay up, PPIs will show a marginally acceptable benefit/cost ratio, but this prospect is somewhat dim. Clearly there is need for some innovative approaches in improving PPI costs and returns. CTDA and some of its PPIs might be a manageable-sized "laboratory" in which to experiment with ways to make PPIs efficient with a view to broader geographical application of proven approaches. CTDA might thus make a major contribution in alleviating the pressing national problem of public irrigation inefficiency and reducing the high Government expenditures for PPI operation and maintenance. CTDA would need to be given considerable latitude in setting water rates and taking other measures if this experiment were to become a success and to be used as a national model.

4. Dryland Farming

Thus far, results of subproject interventions in dryland cereal farming have been very limited and the amounts achieved in this area have not been well analyzed and documented. Some of the early-fertilizer and management trials and the introduction of new varieties suggested that considerable production and income improvement may be possible from better dryland cereal technology, but what needs to be done and where remains to be determined. Soil test-fertilizer response correlation research has not been effectively started and plans to use moisture testing as an additional guide for cropping decisions also are still not in operation though some gypsum blocks for measurement of moisture have been installed. The most that can be concluded with certainty thus far is that trials and demonstrations carried out have not disproved the original hypothesis that economically and technically feasible possibilities for improvement in dryland farming exist. The two years for which the team located data (1981-2 and 1984-5) both suggested acceptable rates of return to fertilizer at the best application rates. But then 1984-85 was an exceptionally good year in terms of rainfall. The dryland farming program should be given increased emphasis in the future including whole farm approaches incorporating crops, forage and livestock. Part of the poor results to date in dryland research and related extension must be attributed to location of the research at Le Kef which is outside the CTDA area and to poor coordination between Le Kef researchers and CTDA operations in Central Tunisia. Also, inadequate attention is given to the economic aspects of the alternative technology.

5. Management and Livestock Improvement

Although started more recently, the Range Management Subproject has achieved more concrete progress than the Dryland Farming Systems Research and related outreach activities. In particular the project personnel have demonstrated much greater concern over the basic economic soundness of alternatives being physically tested.

Major emphasis is being placed on:

- a. Cactus planting as a reserve feed stock which in Central Tunisia means some use most years, but heavy usage in drought years like the present, when feed supplies are very short;
- b. Planting of acacia and atriplex for similar purposes;
- c. Planting of range with medics;
- d. Ammoniation of straw to improve potability and digestibility and effective protein level for ruminant livestock;
- e. improvement in livestock genetics and health measures.

Planting of cactus which already was being accepted slowly by farmers has been additionally tested and proven financially viable. Internal rates of return vary from 12 to 30% and considerably more in drought periods such as the current one. It costs about 115 TD to plant a hectare of cactus and manage it 3 to 4 years until harvesting can start. Returns are calculated at 30 TD/year in normal forage years but 100 TD or more in bad years. About 50% of the planting and guarding cost can be supplied by family labor. Thus, returns to a family unit are very favorable compared with the typical 3 TD/ha under unimproved conditions.

Acacia and other trees and shrubs (e.g. atriplex) also offer prospects of favorable returns but some testing is needed in these. Both these and cactus offer substantial ecological advantage in terms of reduced wind and sand erosion. If guarded, the regrowth of some native herbaceous plants will further increase returns from trees, shrubs and cactus. Interplanting with medics offers possibilities for additional forage production especially in acacia.

Planting of medics costs about 75 TD per year and produces about 2-3 MT of forage over the first year of harvest - conservatively valued at 150 TD. So far about 4000 hectares of range have been improved under the Range project. About 2,000 ha of range improvement have been reported in the CTDA area.

Ammoniation of straw is a new concept for Tunisia. It involves treatment of straw with 3% NH₃ at a rate of about 3% of the weight of the straw: this appears to about double nutritive (energy) value and increase effective protein level by about 200%. Treatment of a metric ton of straw costs 25 to 30TD and increases value by 35 to 65 TD depending on the year and forage demand.

Data are not available on the economics of genetic and health improvement being tried under the project.

D. CREDIT FOR SURFACE WELLS

The major element in credit has been the development of surface wells. Almost 2,000 loans have been made to some 1331 beneficiary families (almost 1800 with AID funds assuming AID makes the proposed reimbursement). Some farmers received loans for a well or well improvement and later for pumping and distribution equipment for the well. Direct subsidies included 15% of total costs from FOSDA and up to 200 TD grant from CTDA.

The major problem noted in the 1983 evaluation, and again in 1986, is the very high percentage of loans on which borrowers are in arrears on payments (75-80%). Major problems included unrealistic repayment scheduling (only 12 months grace period compared with 24 months on the IBRD project), inadequate loan follow up on accounting, billing and farm visits, lack of incentive to BNT (the loan manager) for collection and some questionable choices in lending both with respect to borrower capacity and to qualifications in terms of the project's equity objectives. The team has visited some 30 farms with choices in farms visited made by CTDA personnel. Out of these, three had substantial off-farm income from professional or business activity. These were among the best prospects for repayment. This large percentage (among the ones we saw) apparently reflects a conscious effort of CTDA personnel to take the team to see some of the prospectively best farms along with some of the average operations. In justification of including a few such farms, it should be noted that these better operations are expected to serve a strong demonstration role for other farmers. The capacity issue is a more difficult one. To some extent CTDA did try to take very low income families into its surface well development intervention - some of whom were new to crop cultivation. The most successful or likely to be most successful are those with some good crop experience and, better yet, those that have some prior irrigation experience. The poorest farmers usually are those with only a few livestock and poor grazing land which are poor candidates for successful irrigation farm operations.

Until recently, surface well loan management and loan collection were largely the responsibility of BNT. This has not proven satisfactory. Repayment is reported to be up slightly from 2-3 years ago, but still only about 20% of the loan payments are reported as being on schedule. BNT received and continues to receive a percentage commission on each loan it manages on behalf of CTDA (as it does for other loan funds). This is presumed to cover both the cost of management of the loan during disbursement and subsequent management of the loan through collection of interest and principal. The 1983 evaluation report noted potentially serious problems with respect to loan collection, with many loans already in default at that time. Among the reasons identified are:

- o Unrealistic scheduling of initial repayment in relationship to cash flow from investment. The first payments were scheduled after 12 months while completion of the well and the first harvest from the irrigation usually come much later. The CTDA - USAID projects called for loan repayment to start after 12 months. The similar IBRD project calls for a 24 month grace period.
- o Inadequate monitoring and reporting of loan repayments by BNT.

Other problems identified during the 1986 team visits include lack of well trained and experienced credit specialists, lack of incentives on the part of BNT to monitor closely and collect loans as they come due, and lack of facilities for BNT agents to visit farmers to discuss their farm plans and loan repayment. There also seems to be some uncertainty among farmers whether they will really be required to repay loans that were made under, or were related to, the project. In a couple of instances farmers indicated they had been pressured to borrow additional funds to establish greenhouses which the agents felt would increase the farmers' cash flow and hence economic prospects for loan repayment. Some farmers have seen greenhouses as a temporary expedient until their trees come into production. At that time they may sell or permit the greenhouse to be reclaimed by the Bank in payment of the debt incurred for the greenhouse. Given the rate of inflation, that may permit the debt to be liquidated.

While farmers do make good returns on some greenhouse crops, e.g. melons, the returns reported in many cases would not appear to justify the initial investment capital outlay and high annual operating costs. This is especially the case where farmers grow only one crop per year. For example, a crop of peppers in a 600m² greenhouse was variously reported to produce a gross value of 600 to 1,000 dinars. The greenhouse was estimated to cost about 2,700 TD with annual replacement of plastic about 125 TD, (complete replacement each 3 years). This would suggest an annual capital cost (including replacement of the plastic) of about 500TD/year. Other crops such as melons, if they hit the very early market, might provide considerably higher returns and, of course, very good management would result in higher yields and might result in higher prices.^{1/} Beyond satisfying the local market, which is quite limited, high return prospects are quite limited.

^{1/} Typical yields for a 600 m² greenhouse were estimated to be:

peppers 1,000 Kg, tomatoes 700 - 1,000 and staked melons up to 1,500 Kg. Good management might increase these yields by 50% or more. Tomato yields may go over 2,000 Kg but diseases and nematodes are potentially serious problems with tomatoes.

A team from APMANE and USAID recently conducted an intensive review of the credit program under CTDA and prepared a comprehensive set of recommendations for improvements in loan management. CTDA and BNT are already undertaking some steps recommended in the review. This includes loan classification under which all loans in default will be reviewed and classified initially into one of two classes:

- o Loans where there is evidence that the borrower currently has the ability to repay but for one reason or another has not paid on time. These will be actively pursued by billings, visits and if necessary legal action.
- o Those loans where the borrower currently lacks the financial means to bring his payments up to date. The credit agent and extension agent will work closely with these borrowers to develop farm plans and a repayment plan, including, where necessary, rescheduling of payment to conform to expected future cash flows.

The credit agent and the extension agent will initiate the classification process by visits to the borrowers and to the farm. Their recommendations will be reviewed by an informal committee including CTDA, CRDA and BNT officials.

Ultimately some loans undoubtedly will have to be classified as uncollectable, at least within the framework of this management approach. These will be turned over to BNT for appropriate action which for some may involve classification as uncollectable. These would be written off the books.

The APMANE-USAID evaluation team made 20 other action recommendations which have been classified into short term, medium term and long term shown in Table 3.

CTDA basically has accepted these recommendations and is undertaking appropriate action. The first of these, farmer information days was already in process in July 1985 at the time of the evaluation. Efforts have since been stepped up. Of the other 20 recommendations, numbers 10 and 20 have been completed. Number 3, 6 and 7 are in the process of implementation. Number 12 (classification) as noted above is in the preparation stage as also is number 2.

CTDA and USAID with help of APMANE appear to be taking the necessary steps to improve the credit situation on surface wells. While it is too early to be certain how much improvement ultimately will be achieved, progress and efforts being made to date appear to be adequate to justify the release by USAID of the remaining \$2.08 million for reimbursement of funds advanced by FOSDA for the surface well program (see table below). From the team's discussion with CTDA we feel confident CTDA,
working

APMANE/USAID Evaluation Recommendations

Table 3 - TIME FRAME FOR IMPLEMENTATION OF RECOMMENDATIONS

Short Term 1-3 mos.		Medium Term 3-12 mos.		Long Term over one year	
Rec. No.	Content	Rec. No.	Content	Rec. No.	Content
1	Information days for farmers	3	Initial loan application assistance by credit agents	8	Credit supervision training for agents
2	Pamphlets for farmers	4	Develop farm plan	9	Conduct of farm production studies
6	Revise follow-up forms			15	Training program for agents in farm planning
7	Monthly work plans	5	apprise CRC of supervision responsibilities	16	write credit manual
10	BNT installment notices delivered by CTDA	11	Program to refuse ST credit to bad faith clients	17	specific study for tree crops vs. annual crops.
				18	Decision on whether to offer new type of medium term loan
		12	Client classification by ability to pay	19	Short-term loan program
		13	Setting down loan installments	21	Outside annual evaluations
		14	Setting up farmer accounts at CTDA		
		20	Application of decisions taken in BNT/MINAG annual reviews		

17/11

principally with BNT, will continue to implement the principal recommendations of the APMANE-USAID team.

Small Holder Irrigation Program Obligations and Disbursements
(in US\$)

<u>Intervention</u>	<u>Obligations</u>	<u>Disbursements</u>	<u>Balance</u>
Credit for Surface Wells	3,200,000	1,121,335	2,078,665
Springs	100,000	6,737	93,263
PPIs	1,000,000	277,045	722,955
=====		=====	=====
Totals	4,300,000	1,405,117	2,894,873

One other issue to be considered is whether CTDA should be in the business of making loans directly to farmers in its area of operation. In general, the team believes that in the long run this like other "non traditional" and peripheral activities (distribution of inputs, machinery services) should be left to cooperatives and private entrepreneurs. DAPME and APMANE would appear to be candidates to take over the CTDA medium term credit program for surface wells, and provision of credit to cooperatives.

E. OTHER CONSIDERATIONS

1. Fruit and Vegetable Marketing and Pricing

Over the past decade or two, fruit production has been increasing rapidly (at about 2.5% above the rate of population growth). This has been absorbed at reasonably attractive prices largely as a result of a healthy growth in per capita income and some exports. However, more recently per capita income growth has declined and export prospects are less promising with the entry of Greece, Portugal and Spain into the EEC. Adjustments cannot be made as quickly on fruits as on vegetables, whose production can be adjusted rather readily (there is evidence from changes in areas planted to different vegetables that farmers do respond quickly). In recent years there has been a very rapid build-up in trees planted in Tunisia. Currently the number of trees (apples, pears, peaches, table olives) classified as young (immature) is about twice the number of mature trees and trees continue to be planted at a rapid rate. This implies availability in a few years of supplies of fruit 2-3 times current consumption.

There is a considerable "private sector" involvement in fruit and vegetable marketing in that the wholesalers and retailers of these commodities are private individuals. There is, however, considerable state intervention in the market in the form of price regulation and taxation. These measures distort the market and prevent price information feeding back to the producer to stimulate greater production or discourage the production of

surplus yields. There is currently no market information service, except the fortnightly ceiling price decisions, therefore there is no rational basis upon which farmers can plan their marketing. The Ministry of Economy, Division des Prix, sees itself as a regulatory body rather than a marketing facilitation organization and is primarily concerned with the margins which the intermediaries take, ignoring the large margin which the tax represents. There is limited entry to the business for reasons which were not wholly clear but liberalization of the market would appear likely to remedy many of the problems, rather than stricter control.

Marketing appears to impose the greatest problem and risk for many new irrigation farmers who have incurred heavy investment costs under the project. This is an area where the public authorities can help. The creation of service cooperatives and private firms has proven in most similar situations to provide the best arrangement for marketing of fruits and vegetables and supplying production inputs and services. Both forms are dependent on availability of adequate margins between prices they pay and prices at which they sell, to cover operating costs and provide a reasonable return on investment. If such a price structure exists farmers are likely to perceive the benefits of cooperative action; then cooperatives can survive private sector competition and the removal of price controls and subsidies. There is some concern that reduction in government price intervention would reduce farmer prices and incentives and increase consumer prices.

Taxes and regulations currently are a major constraint to improved marketing both in terms of outlay for the tax and the constraint imposed on the free interplay of market forces. Currently fruit and vegetables going through the wholesale market bear a 3% national tax, plus a municipal tax which is variable (4% in Siliana; 8% in Kasserine; higher still in Tunis). These create disincentives to production, and also blur market price signals (combined with imposed ceiling prices and fixed margins); thus these taxes make more difficult the farmer's job of optimizing revenue and the return to public investment.

2. Whole Farm Approach in Advising Farmers

A substantial effort is being made in analysis of various types of crops and providing advice on individual crops but not whole farming systems which deal coherently with mixes of farming enterprises which each individual farmer has to manage to use his total resources optimally. The CTDA should be doing systematic whole-farm data collection recording the inputs and outputs for each crop, the cropping patterns by season and area, the labor inputs in terms of time and costs, marketing methods and costs. These cost data should be collected as a stratified representative sample of the farms in the area and used as a basis for refining CTDA's model farm concept and for planning. Clearly, such a data collection and analysis program repeated annually will build into

a time-series, demonstrating the effects of changes in policy, climate, public taste, etc.

In parallel, data should be collected on the other elements of farm family life and income such as off-farm revenue, educational level, consumption patterns, measures of health, time use on tasks other than the farm, etc.

For the purpose of advising the farmer and the government of future policies, market intelligence should also be collected on prices and quantities available. These data communicated to the farmer will enable him (with the help of the extension service) to make rational decisions on marketing in the short run and crop choice in the longer term. The data and analysis should be used to help farmers develop farm plans that integrate physical, financial, labor and market considerations along with family aspirations.

3. Provision of Technical Assistance

While some aspects of the TA and training provided by OSU have been well executed, OSU coordination and contribution to cooperation among activities (e.g. coordination of work at ESAK and range management) for Tunisia's development have been very weak.

Analysis of results of research and field trials needed for planning of the CTDA dryland extension program has not been transmitted in reasonable time, e.g. results for 1983-84 and 1984-85 were still not available in March 1986. The need for micro-economic and farm management analysis of interventions in agriculture has not been adequately addressed by OSU.

The assistance of the Tunisian resident technical advisor to the Planning Direction has apparently been of great value in helping the staff of the Direction to improve their capability in local level project identification and design, and in improving relationships between CTDA and the MOP. This position was intended to be temporary while CTDA developed its regular staff capability.

The new IDA technical assistance has had little impact to date and the two TA specialists are having difficulty integrating themselves into the work of their Direction and the CTDA as a whole. Their "training" function is likely to be minimal given their advisor role and different views on responsibilities among the various parties.

F. SOCIAL IMPACTS

1. Social-Cultural Changes

What are the most significant socio-cultural changes that have been brought about or encouraged by the various subproject interventions?

Of all of the CTRD's subprojects, it is probably those bringing potable water and small farm irrigation water that have produced the most significant socio-cultural changes. These changes manifest themselves more specifically through the types of relationships that are in the process of being established between CTDA technicians at all levels of the organizational hierarchy, and subproject beneficiaries. It is especially at the level of family farms developed around shallow wells that one can see the degree of these changes most clearly. But it is only possible really to comprehend the true meaning of these changes if one recalls the traditional behavior of the Central Tunisian peasantry and that of the specialist technicians of the old style of agricultural development in semi-arid areas.

The peasant traditions of Central Tunisia are conditioned by the ecological precariousness of the region and those of the technicians are conditioned by the cultural distance that separates the urban elite from the peasantry, and especially from those of semi-nomadic origin.

This ecological precariousness shows itself by the alternation of, on the one hand, several years of drought and of the quasi-absence of agricultural production frequently linked to dramatic livestock losses, on the other hand, and years of good rainfall and temporary opulence. This climatic cycle discourages any medium or long-term accumulation or investment strategy and predisposes the peasants toward extensive cultivation and particularly toward nomadism or more precisely, semi-nomadism--seasonal transhumance of flocks toward the Tell in summer and the search for employment in olive picking in the Sahel in the autumn. This seasonal rhythm was broken in the 1930's, and the forced sedentarization of semi-nomadic groups translated itself into an excessive vulnerability of these new peasants during drought years. The survival of a significant proportion of these peasant families was due to philanthropic acts on the one hand, and the free distribution of staples by the State on the other, leading to the emergence of a welfare mentality that is completely the reverse of the traditions of pride and honor characteristic of nomads.

It was probably the memory of these years of drought and famine that generated the priority given to the semi-arid areas of the South and the Center by the Tunisian Government in the first years after Independence. It is thus that a "National Fund for the Development of the Center and the South" was created by the

Beylical decree of November 22, 1956. The goals of this "Fund" were later shown to have been too ambitious for the slender means of the new Tunisian state. The decree of June 20, 1957 relating to the formation of development units (Cellules de Mise en Valeur) concentrated government intervention on perimeters irrigated by public deep wells. This statute reveals the statist conception of relationships between the techno-bureaucratic administration and the peasantry, and especially the semi-nomadic peasantry of the Center and the South. This decree authorizes the state to intervene in the perimeters for a period of up to five years in order to carry out the first tasks of development, especially soil preparation, irrigation works, planting of trees, and construction of housing and collective installations. The decree also envisages the creation among the beneficiaries of each development unit an "obligatory cooperative group" whose purpose would be the farming and management of the Unit (Cellule). This obligatory group is a reformulation of a colonial institution, namely associations with a collective purpose which were merely a legal mechanism for reinforcing the norms of public accounting. The essential point is that it is the technicians who design, develop and manage. Peasant participation is limited to the performance of tasks that are defined by technicians. The later transformation of these development units into production cooperatives merely served to reproduce this model of relationships between technicians and peasants.

It required the political failure, in 1969, of the generalization of agricultural production cooperatives to bring into question the underlying logic of this system. But this questioning is still far from total. Both peasants and technicians are still prisoners of the conditioning of the recent past. This is demonstrated also in the contemporary management of irrigated perimeters. Nevertheless, the new policy of encouraging private initiatives in the agricultural sector has given rise, in Central Tunisia, to a mass of small, dynamic and enterprising owner-operators who need the financial and technical assistance of the CTDA to ensure their transformation from semi-nomadic peasants into farmers specialized in irrigation and the management of "mixed farms" consisting of an irrigated plot, one or many rainfed plots, and small-scale animal husbandry that is supported by both the irrigated and rainfed plots.

It is an enhanced understanding of this new peasant strategy that should be better known to CTDA's technicians.

2. Forms of Participation

What are the forms of beneficiary participation in the design and implementation of CTDA projects?

To date, the projects implemented by the CTDA have been responses to requests which were formulated as a rule by the local authorities and the spokesmen of the national organizations: the

Destourian Socialist Party and the National Farmers' Union. These requests concern improvement in the living conditions of a population which has been greatly disadvantaged in comparison with the populations of the other regions, and concern also the technical and financial support of those peasants who are prepared to change their traditional cultivation system with a view to achieving a more intensive and more rational exploitation of their farms.

The projects intended to improve living conditions (Potable Water, primary health care, etc.) are in principle intended for local communities, or, more precisely, for the residential zones that have been selected by the technical experts in collaboration with the local authorities. The beneficiaries' participation in their implementation is in general limited to unpaid communal work days. Practically speaking, it is only at the level of the day-to-day operation of the potable water sites that the beneficiaries are called on to participate: i.e. to keep the sites clean and, especially, to finance the occasional costs of maintaining the functioning of the pumps. The recovery of these functional expenses seems to have been, at the outset, the chief motivation for the founding of the water-user associations. But for the population concerned with these water-sites developed by the administration, the most controversial problem is how to reconcile the conflicting interests of the different kinds of water-users:

- o Those who use the water exclusively for family consumption;
- o Those who use it for sale (to be consumed by people living at distance and for irrigation);
- o Those who use it to water their livestock;
- o Those who use it to irrigate plots of land close to the water-sites.

In any case, the problem of grouping those who benefit from potable water so as to provide for collective user management requires prompt solution.

The CTDA and the local authorities are presently working on a survey of the reactions of those who benefit from potable water in order to set up associations of water-users. These associations were not set up before the water-sites were constructed. However, their existence is clearly a precondition for the continued functioning of these water-sites, which are so essential to the improvement of living conditions for scattered populations.

The problem of beneficiary participation takes on a different form in the framework of specifically agricultural projects. CTDA assistance is conceived as a contract binding it to individuals

who are juridically distinct as regards the irrigated perimeters as against the indispensable assistance to the small farmers in the construction of shallow wells.

In the case of the irrigated perimeters, the farm families which are involved in these projects have generally done nothing to become farmers specializing in irrigated agriculture. It is the irrigation technicians who are responsible for the choice of deep well sites. The use of the water from these wells is not predicated on any kind of professional grouping. But it is the low yields from these irrigated perimeters compared with those of the family farmer with shallow wells, that have made clear the need for a way to group the farmers involved in these perimeters in order to provide for better utilization of these deep well capacities -- both on the part of the farmers and on that of the technicians responsible for maintaining the equipment.

Those who are exploiting the surface wells are the CTDA's best clients. They are farmer-entrepreneurs, often in modest circumstances, but nevertheless having available some small savings, generally of non-farm origin (e.g., the emigration of one or two family members.) These farmers have, by themselves, conceived, planned and accomplished their life-time project: a surface well which will free them from the hazards of rainfed cultivation without completely abandoning the non-irrigated part of their property. For the CTDA's technicians these farmers present no problems except that of loan recovery. But the possibilities for creating new surface wells are distinctly limited. The maintenance and improvement of these surface wells will not require as much personnel, capital and effort as was the case during their construction. Actually, it is with the beginning of this new phase that the surface well farmers especially need the technical help of the CTDA, both at the level of extension as well as of marketing. It is impossible to envisage this help given the model of inter-personal relations between the CTDA technicians and the farmers which presently predominates. In order to make maximum use of the CTDA's potential, the beneficiaries of these projects must form groups.

After the initial start-up phase of implementation of agriculture development projects, the CTDA has reached a point at which the profitability--even strictly economic--of its actions depends on its ability to help the beneficiaries of its projects to form groups in order to profit from the financial resources and the scientific know-how of the CTDA staff. But the peasantry of Central Tunisia has no tradition of group formation along strictly professional lines, based neither on kinship nor on the political cell model. Likewise, the CTDA cadres have not been professionally trained to negotiate their projects with local organizations that are autonomous and not entirely dependent on the resources available to the technicians. Nevertheless, it is essential to emphasize that the CTDA cadres are aware of the importance of the problem of the organized participation of the

farmers, though without having at their command a developed strategy for facilitating the emergence of an associational process among the beneficiaries of CTDA projects.

G. Recommendations

1. Production Emphasis

a. The CTDA should concentrate future irrigation development investments in Central Tunisia on (a) surface wells where technically feasible (some of which might be shared by several farmers), and (b) low-volume deep wells which would involve sharing of water and shared management and operational responsibility. Maintenance of PPIs is necessary; development of Irrigation Associations (AICs) to take over these tasks is desirable in the interest of increased efficiency and reduction in the burden on public agencies and the treasury.

b. Greater emphasis should be given to (a) water management particularly water delivery and application systems which reduce water losses and (b) water application which is better keyed to plant consumption needs. This should be applied to both PPIs and surface wells.

c. Supplemental irrigation should be emphasized in applied research followed by implementation with a view to a balance with intensive irrigation.

d. In addition to 1 (b) and (c) above, greater effort should be made in development and testing of low cost programs to increase ground water recharge and, as appropriate, in subsequent implementation of these programs.

e. The CTDA should place more emphasis on integrated farming systems and complete farm plans; this should specifically include forage and livestock along with crops and include both irrigated agriculture and drylands (with crops and range) where the farmer has such resources.

f. The CTDA should provide a better balance between irrigation and dryland agriculture (that is, more of the latter). This is particularly important in view of the virtual completion of development of much of the known water resources in much of the CTDA action area.

g. Cooperation with forestry, soil and water conservation entities is essential in development of coordinated programs for afforestation, soil conservation and ground water recharge on public and private lands that should take place. CTDA should be involved and play a catalyzing role. This should include provision for socio-economic problems that arise in connection with deferral of income flow resulting when land is temporarily taken out of production for tree planting, and soil and water

conservation activities. Unless new action plans include specific provision for compensation, or other solutions to the social problems that may arise, tree planting and soil and water conservation programs are likely to have very limited success. Large-scale reforestation and afforestation do have a role to play, but particular emphasis should be placed on small-scale tree and cactus planting on private lands.

h. Financing should be provided for a program of comparative physical and economic analysis of principal cactus species and varieties for drought and cold tolerance yield under different soil and fertility conditions, resistance to grazing and disease, planting requirement and nutritive value. This is estimated to cost about \$25,000 per year over 10 years.

2. Non-Productive Activity Emphasis

a. The CTDA should develop an explicit set of criteria derived from national goals and a coherent strategy for development of Central Tunisia for the choice of actions, projects and programs that it will undertake. These criteria should include consideration of (a) economic benefit/cost; (b) social benefit/cost and (c) the appropriateness of the activity in terms of others being implemented, e.g., place in terms of the "regional" plan.

b. In terms of micro-level social benefit/cost considerations, in determining choice of non-agricultural projects to receive priority, emphasis should be placed on the probable impact of the project on:

(1) Those quality of life factors which, inter alia, have a bearing on migration--education, electrification, improved housing, potable water.

(2) The linkages between the impact of the project on income-generation and employment and the improvements possible in quality of life at the household level.

(3) The related impact in terms of providing possibilities for local investment of agriculturally-derived surplus income--e.g., small and medium enterprises.

(4) The impact of the project on the division of labor at the household level, and among various social categories--men, women, youth, children.

3. Socio-Economic Analysis

a. Micro-level, household budget and consumption studies should be carried out to monitor the impact of project and program interventions. Quantitative and qualitative studies should be

carried out on family labor and on employment generation at the farm level disaggregated by sex and by age. Other impacts of project interventions on men, women and youth should also be evaluated on a routine basis.

b. The CTDA should do systematic whole-farm data collection, recording the inputs and outputs for each crop, the cropping patterns by season and area, the labor inputs in terms of time and costs, marketing methods and costs. These costs should be collected on a stratified representative sample of the farms in the area--and used as a basis for refining the CTDA's model farm concept and for planning. Clearly, such a data collection and analysis program repeated annually will build into a time-series, demonstrating the effects of changes in policy, climate, public taste, etc.

In parallel, data should be collected on the other elements of farm family life such as off-farm income, educational level, consumption patterns, measures of health, time use on tasks other than the farm, etc.

c. Establish a staff and capability for micro-economic and social studies and analysis in the CTDA.

(1) The task of micro-economic analysis and farm management studies (along with related staff and other resources) should be assigned to the Extension Service in the CTDA. (These analyses would also be used by the Planning Directorate for planning.)

(2) Social scientists, and the evaluation and related social impact analysis functions within CTDA, should be assigned to Planning. This staff should work with other Directions as appropriate.

(3) Implement the recommendations in the Pro/Ags of the Rural Extension and Outreach and the Area Development subprojects calling for the recruitment of social scientists to the CTDA.

(4) Develop a system for continuing training of CTDA staff to help them to increase their awareness of the social problems that are characteristically faced by peasants of semi-nomadic origin, both in Central Tunisia and in those other countries where there are similar populations encountering similar problems.

(5) For the new Potable Water Project, be careful to see to it that a criterion for the selection of the head of the Self-Management Unit, among other requirements, is the ability to conduct a field survey, and also that the professional status of the members of this unit does not differ from that of the CTDA's agronomists and economists.

(6) For the Launching of the Service Cooperatives. To devote a part of the Experimental Fund to develop a pilot experiment by launching a service cooperative in the Sbiba delegation. To devote as much time as is necessary for the successful outcome of this experiment.

The first task under both (a) and (b) above should be to review carefully work done to date and to develop work plans for the next year or two. USAID should be prepared to finance some technical assistance (Tunisian or expatriate) to assist in this initial phase and to assist in annual reviews of results and replanning over the next 3-4 years.

4. Marketing and Cooperatives

a. Careful analysis should be carried out with central agencies of likely future supply, demand (including clear export opportunities) and prices of tree crops as a basis for future planning of fruit programs. CTDA should consider the requirements for profitably marketing fruit domestically and internationally in fresh and processed form.

b. The GOT/CTDA should consider the effect of the various pricing policies which it currently pursues. This should include and examine the effect on the farmer and the improved efficiency which could be achieved by straight transfer of funds to the municipalities rather than the cumbersome distortion of the economic framework by taxes on production within which the farmer is supposed to make his way.

c. The Ministry of Economy should play more of a market intelligence role and less of a regulatory role. For the purposes of advising the farmer and the government, and in its regional planning, CTDA should cooperate with the Ministry of the Economy, Direction des Prix and other agencies in analyzing and disseminating market intelligence. These data communicated to the farmer will (with the help of the extension service) facilitate rational decisions on marketing in the short run and crop choice in the longer term.

d. Establishment of a grading system should be considered for certain products, e.g., for sales to points at long distances from the production point - Tunis, Sousse or export.

e. Together with DAPME in the Ministry of Agriculture, both at the central and governorate levels, CTDA should work more actively to facilitate the formation of viable service cooperatives. These cooperatives will, of necessity, follow the statutes and pattern established for such entities in the GOT in terms of financial and management decisions. CTDA should carry out studies of the various bases on which individuals in the relevant region are most likely to cooperate and form viable

groups; studies of the comparative advantage of service cooperatives in the various sub-regions for the purchase of inputs and their resale to members of the cooperative, and analysis of the type and availability of management that would best suit each type of activity and cooperative. It is suggested that assistance for such studies and related training be provided to CTDA, in conjunction with the appropriate representatives of DAPME.

f. A portion of the Experimental Fund could be spent for the creation of cooperative income-generating activities for women -- weaving and other types -- that would be controlled by the women themselves. Good market studies should be a prerequisite for choice of activities, and appropriate training should be provided.

g. CTDA should assume a principal role in promotion and support of private enterprises including private cooperatives in marketing of agricultural products, distribution of inputs and supply and production services. Specifically it should:

(1) Conduct feasibility studies to identify requirements in these areas, opportunities for private firms and cooperatives, and then specify courses of action;

(2) Assist cooperatives and private firms in preparation of investment and operational plans and in identifying sources of capital;

(3) Provide technical and management advice to small private firms and cooperatives.

(4) As soon as feasible CTDA should divest itself of input distribution and mechanical service functions.

5. Surface Well Credit

a. CTDA should accelerate efforts to resolve problems in the CTDA-BNT surface well credit operation along lines recommended by the APMANE-USAID evaluation team.

b. CTDA should begin now to explore ways to divest itself of the surface well lending activity. DAPME and APMANE would appear to be candidates to take over the CTDA medium-term credit program for surface wells and to provide development credit to cooperatives.

c. The team recommends that USAID release the remainder of the total fund planned for surface well credit (out of the \$3.2 million programmed surface well credit) to reimburse BNT for funds advanced by FOSDA for credit in the hopes of AID funds becoming available (\$2.08 million). USAID should tie the release to specific progress, e.g. \$500,000 now, \$500,000 on or about July 1,

and the balance about September 1, assuming CTDA and BNT continue to implement necessary corrective actions.

d. In conjunction with implementation of recommendations on divestment of input sales and mechanical services, CTDA should end involvement in production credit.

6. Institutional Development including Technical Assistance

a. OSU should be required to develop explicit plans for improvement in its contribution to coordination, to timely submission of analyses of field data and to micro-economic and farm management analysis. Failing this, CTDA and AID should consider a different arrangement for these essential inputs to the activities it supports which are aimed at contributing to development of Central Tunisia.

b. The present Extension advisor's contract is to terminate soon. CTDA should immediately review the need to continue this position and make arrangements accordingly. The team is of the view that the position should be continued at least initially for two years.

c. IDA management, the TA specialists and CTDA senior management and USAID should meet together to resolve the various issues about the scopes of work and reporting responsibilities of the IDA TA. Future short-term social science consultancies under the IDA project should be carried out primarily by Tunisians especially where they involve studies of the population rather than management or organizational assistance to CTDA itself.

d. A training session in shallow well equipment repair and maintenance should be provided to AHA Direction technical staff.

e. Coordination and cooperation between CTDA and the Range Management project should be strengthened. The representation of CTDA on the Range Management Committee provides a mechanism for top-level coordination. CTDA should make maximum use of this mechanism and draw more on the OEP project staff for training and for technical information to strengthen range interventions in Central Tunisia.

f. More attention should be given to applied research on supplemental irrigation potentials and more careful applied socio-economic research should be carried out to find ways in which the less-advantaged small holders can be given access to improved water resources and the technology to manage them effectively.

g. In designing future assistance to Central Tunisia, USAID should work carefully to reinforce gains already made,

including the development of the CTDA as a viable design and implementing organization. In order to ensure this outcome AID should:

(1) Maintain the CTRD umbrella project approach for at least the next five years; new subprojects may be added, and old ones expanded, e.g., for soil and water conservation, farm management economics, marketing strategies and cooperative development;

(2) Ensure that such subprojects follow the selection criteria presented in the original CTRD PP, particularly that funds be provided through the CTDA; and support recommendations 2 a, b above.

(3) Involve the DPE (Direction de Planification et Evaluation) and other Directions in CTDA, as much as possible, in subproject design, as is currently being done for irrigation in Sened;

(4) Maintain assistance to CTDA separate from national-level agriculture projects. This will be essential if CTDA is to effectively implement the agriculture activities in its current area of operations and assume a broader development role in additional areas of Central Tunisia as is being proposed;

(5) That AID technical staff continue to work directly with the appropriate technical staff in CTDA for technical aspects of project management, but centralize "program" management and related administrative functions within the ARD office.

ANNEX A

STATEMENT OF WORK

A. EVALUATION OBJECTIVE

The USAID/Tunis Mission and CTDA have scheduled for March 86 a joint AID-GOT evaluation of the Central Tunisia Rural Development (CTRD) Project (664-0312). The evaluation will assess the overall impact of the USAID-financed component of the program of the implementing agency, the Central Tunisia Development Authority (CTDA). It will also evaluate the strengths and weaknesses of the CTDA as an instrument for region-wide, multi-sectoral planning, implementation, monitoring, and evaluation.

The regional development mandate of the CTDA is unique in Tunisia, and if proven to be effective, may be extended as a model by the GOT to other disadvantaged areas of Tunisia. The CTRD Project was authorized in 1979 to assist the recently instituted CTDA in its regional rural development efforts.

The evaluation team, consisting of three Tunisian and four U.S. consultants, will provide specific guidance to USAID/Tunisia in determining the nature of its future assistance to the Central Tunisian Region. At issue is the effectiveness and efficiency of the CTDA instrumentality as opposed to traditional use of sectoral, area-focused organizations in carrying out both GOT and U.S. development project objectives over the next five years. Of particular concern in this context is the extent to which the GOT (with or without AID support) will continue to sustain and use the CTDA as a development agency in Central Tunisia as well as a model for developing other regions.

B. EVALUATION TEAM

The evaluation team will consist of French-speaking expatriate consultants arranged by AID including: (1) institutional/management specialist, (2) agricultural economist, (3) agricultural economist/development specialist, (4) anthropologist/sociologist, and under a separate CTDA arrangement three Tunisian consultants will be recruited: (1) economist, (2) sociologist and 3) management specialist.

C. OVERALL SCOPE OF WORK

The evaluation team shall assess the various ongoing CTRD sub-projects, including: (664-0312.1) Area Development (support to the CTDA), (664-0312.3) Small Holder Irrigation, (664-0312.7) Rural Potable Water and (664-0312.9) Rural Extension and Outreach. In addition to evaluating the substantive strengths and weaknesses of these development efforts, the team must assess the role of the CTDA in implementing or organizing and monitoring the

implementation of the technical sub-projects. The question is whether or not the sub-projects are most efficiently carried out under the umbrella of the CTDA, and whether this organization, after seven years of existence, has achieved a level of viability and sustainability consonant with both GOT and USAID objectives in rural Tunisia. Of particular importance is the extent to which the CTDA has carried out regional planning and inter-agency coordination functions in recent years.

Specifically, the scope of work for the evaluation shall concentrate on: institutional analysis of the CTDA; agricultural and economic/financial analysis of the technical sub-projects; beneficiary impact analysis, including those on the poor majority and women; and assessment of the past involvement of and future potential for the private sector in small-scale development enterprises in central Tunisia.

D. SUBSTANTIVE AREA SCOPES OF WORK

1. Institutional/Management Specialists

The institutional/management specialists shall have the primary responsibility of assessing the strengths and weaknesses of the CTDA mechanism for carrying out region-wide, multi-sectoral rural development more efficiently and with less cost than by traditional line ministries and their parastatals.

Specifically, this will include:

a. Assess the extent to which the CTDA has developed the organizational and technical skills to perform effective decentralized regional development planning;

b. Assess the degree to which the CTDA has actually carried out comprehensive regional planning since its inception;

c. Recommend necessary changes in organizational structure and management practices to improve planning and project design functions;

d. Evaluate the extent to which the CTDA has coordinated its regional development activities with other local development organizations;

e. Assess the degree to which the CTDA has successfully collaborated with other institutions (including the College of Agriculture at Kef) in carrying out programs of mutual concern;

f. Assess the effectiveness of the linkages between the various sub-divisional CTDA offices and the headquarters with special attention to the channeling upward of beneficiary needs and the distribution downward of project inputs in a manner enhancing decentralization of the development process;

g. Evaluate the ability of the CTDA to identify and test low-cost technologies in the various administrative delegations of the CTRD zone.

2. Agricultural Economists/Economist

The 3 agricultural economists/economists will undertake an assessment of the overall economic impact of the CTDA Program on Central Tunisia, as well as the more specific economic impacts on the various CTRD Subproject target populations. These activities will entail:

a. Examination of regional employment generation and per capita income changes related to CTDA activities;

b. Examination of the regional credit, input distribution, crop storage, and marketing systems and their interrelationship to past and present CTDA activities;

c. A review of the actual and potential interrelationship of rural cooperatives, warehouses, transportation services, and private entrepreneurial activities to CTDA interventions;

d. Recommendation of specific measures to improve the economic linkages between various CTDA activities and the regional economic infrastructure for input distribution, storage, and marketing of produce;

e. Recommendation of measures for increased private sector involvement in CTDA-related activities, including identification of specific private sector activities that would tie in with future/ongoing objectives.

f. Evaluation of CTDA's implementation of its agricultural activities, in particular the Small Holder Irrigation and Rural Extension/Outreach (CTRD) Subprojects.

g. Assessment of and recommendations on the future direction and focus of CTDA's agricultural program, based on (a) lessons-learned from prior agricultural activities in Central Tunisia, (b) production and marketing constraints, and (c) GOT agricultural priorities for the 7th Five Year Development Plan.

3. Anthropologists/Sociologists

The anthropologists/sociologists will assess the socio-economic impact of the CTRD on the beneficiary population of central Tunisia.

Specifically, this will require the following:

- a. Examination of sub-project impacts on household employment and income;
- b. Examination of socio-cultural change stimulated by sub-project interventions;
- c. Evaluation of the degree of beneficiary participation in project design and implementation;
- d. Assessment of the involvement of local popular and governmental organizations in project planning and implementation;
- e. Recommendation of specific measures to widen the involvement of local organizations in a more decentralized development process.

ANNEX B

COSTS AND IMPACTS OF PRODUCTION INTERVENTIONS

Socio-economic impacts of principal interventions were summarized in Chapter IV. This annex deals in somewhat greater depth with costs and impacts of production interventions. The team has focussed primarily on direct costs of individual interventions. This was done because the main focus of the evaluation is the future and the percentage which indirect costs have been of total resources in the past would not be representative of the likely indirect costs relative to total resources in the future. CTDA incurred substantial start-up costs before it began to produce substantial results and production has been considerably constrained to date by requirements for development of staff, new procedures, the design and analysis of interventions and delays as the various parties reached understanding about approaches. Costs of technical assistance and training of CTDA staff abroad were particularly heavy in the first years. With most of that behind them, CTDA should be able to show an improvement in the percentage of total resources passed on to final beneficiaries.

Overhead costs of CTDA net of these early start-up expenses (estimated at 15%) are considered part of the activity costs. In general, this approach includes the direct financial contribution but not the direct costs of other agencies that play a role in the implementation of the program. The proposals which the team has made for redirection of CTDA operations, if adopted, should result in further improvements in the CTDA contribution to development of Central Tunisia though, because they expand the role, they may not reduce indirect costs.

A. TOTAL RESOURCES

Data supplied by CTDA indicate that the total resources made or to be made available for the Central Rural Tunisia Development (CTRD) Program are the equivalent of US\$76,117,000. The GOT accounted for \$50.5 million, AID \$18.7 million and IBRD \$6.9 million. Clearly, the GOT has attached high priority to Central Tunisia development in use of its own resources.

The total project assistance obligated by USAID is shown in Table 1 with project activity completion dates of individual activities. In general, the distinction between grant and loan funds reflects the use made of the money. Thus loan funds are primarily to finance direct support of development activities, e.g. financing of surface wells, PPIs and potable water. Grant funds are largely for expatriate technical assistance, training abroad and some imported commodities (e.g. drilling rigs for potable water, visual aid equipment for extension, vehicles).

TABLE 1

USAID LOAN AND GRANT FUNDS OBLIGATED
THROUGH JULY 1985 TO ASSIST THE SUBPROJECTS

Amounts obligated by the
Agreement as amended to date
(in millions of dollars)

<u>Subprojects</u>	<u>Loan</u>	<u>Grant</u>	<u>Total</u>	<u>PACD</u>
Area Development	-	3.378	3.378	30/9/87
Dryland Farming Systems Research	-	2.800	2.800	30/9/86
Small Holder Irrigation Development	4.135	0.400	4.535	30/9/86
Potable Water System	0.750	-	0.750	30/9/86
Rural Extension and Outreach	2.805	-	2.805	30/9/86
Rural Potable Water	1.500	0.690	2.190	30/9/86
Range Development and Management	2.915	2.685	5.600	30/9/89
Community Development PVO	-	0.437	0.437	30/9/87
<u>TOTAL</u>	12.105	10.390	22.495	

B. COST PER BENEFICIARY FOR PRINCIPAL INTERVENTIONS

Data on number of beneficiaries and costs per beneficiary are more adequate for Kasserine Governorate than for the other 5 delegations. Therefore these data will be used as the principal basis for estimating costs and benefits. Data on the 12 delegations of Kasserine are shown below for 1980-85:

Project Costs per Beneficiary

Intervention	No.	Estimated Costs (TD)	Estimated Number of Beneficiaries	Cost per Beneficiary	
				Direct (TD)	With Over- head (TD)
Potable Water	35	1,790,000	65,600	27.54	32.5
Basic Health	28	1,515,009	45,057	33.62	39.7
Electrification	12	397,000	2,382*	166.67	196.7
PPI		3,364,000	3,036*	1108.04	1307.0
Surface Wells		3,539,600	7,986*	443.23	527.0

Source: CTDA Records on Kasserine Governorate

In considering costs per beneficiary in irrigation, it should be borne in mind that irrigation also provides potable water. Adjusted for this contribution, the costs per person for irrigation would drop to about 410 TD for surface wells and 1075 TD for PPIs. The project cost per hectare for surface wells was approximately 1,330TD and for PPIs it was approximately 4,100 TD/ha. The FOSDA subsidy and self-financing of the farmer would bring this figure up to about 1,800 TD. Adding 17.6% overhead would bring the totals to about 2000 TD/ha for surface wells and 4800 TD/ha for PPIs.

The table below shows progress up to 1980 and results since in terms of increase in number of beneficiaries (and hectares for irrigation). The data indicate largest percentage increases in Kasserine in numbers of rural people served by potable water (119%), surface wells (165%) and surface well area irrigated (230%).

*/ These numbers of beneficiaries are based on an estimate of 6 people per family with 397 families benefiting from electricity, 600 from PPIs, and 1331 from surface wells. In the case of surface wells and PPIs there will be substantial numbers of indirect beneficiaries from increase in farm employment and from increased marketing of produce and supply of production inputs. Electricity also may result in some productive and secondary economic impacts.

Progress 1980-1985

	Pre 1980 Situation		Additions in 1980-1985			
	No. of Beneficiaries	Area (Ha.)	No.	Beneficiaries (%)	Ha.	Area (%)
Potable Water	58,070	-	65,000	111.9	-	-
Basic Health	236,014	-	45,057	19.1	-	-
Electricity	10,320	-	2,382	23.1	-	-
Surface Wells	4,830	805	7,986	165.3	2660	330.4
PPIs	6,813	4,665	3,036	44.6	820	17.6

Source: CTDA records

In comparison with the other interventions, surface wells offer substantial advantages. They provide economic benefits at least comparable to PPIs at one third of the initial project cost per beneficiary and they leave the Government free of further responsibility for operation and maintenance. Further efforts can increase the number of beneficiaries per well and increase hectares served per well thereby cutting cost per beneficiary substantially.

C. IRRIGATION

The principal irrigation interventions were shallow wells and PPIs. Springs, which initially were included, were found to offer little opportunity because water was largely already preempted.

IBRD analysis of all past irrigation investment and resulting increase in production showed a 20% gross return on investment after allowance for major cash production outlays. Project costs per hectare irrigated in the Central Tunisia program are roughly 3 times as high for PPIs as for surface wells which typically have been the main focus of GOT irrigation investment. Adding FOSDA subsidies and self-financing brings average investment costs per hectare to about 45% of the PPIs. Surface wells are estimated to gross about 15% more in value of output per hectare.

1. Shallow Well Operations and Costs

Major differences were found in costs and benefits depending on water supply, cropping patterns, irrigation systems and irrigation intensity. Shallow wells tend to be fairly uniform in diameter (about 2.5-3 m), construction, pumping and cistern lay-out. The major differences in cost per unit of water were related to the depth the farmer dug to reach water and the rate of flow. Most of the shallow, hand dug wells are between 15 and 40 meters deep and

have a flow sufficient to intensively irrigate about 2 hectares of mixed fruits and vegetables. Lining with stone masonry is a standard practice if the farmer has the money. One well visited was only 9 meters deep and had 7 meters of water in it. One farmer had two wells, the lower of which irrigated some 7 hectares, mostly in trees. Some farmers were irrigating less than one hectare of land with their shallow wells. Costs are a function of depth but most recently constructed wells cost 6,000 to 8,000 TD including pump, cistern and conveyance systems.^{1/} Some were as low as 5,000 TD and some as high as 12,000 TD. In 1983, the project evaluation reported typical costs of 3,500 - 4,000TD. Inflation and the devaluation of the dinar would account for most of this difference.

The amount spent on land leveling and fitting of fields varies widely depending on the slope and irrigation methods employed. At the lower extreme with reasonably level land and a hose pull or drip system the cost of leveling is virtually zero. The other major investments in connection with the irrigation are planting trees in the case of fruit operations and establishment of greenhouses which are common in connection with vegetable production. Fruit operations have an additional cost in the form of long delays before the first harvests -- usually 4-5 years depending on the fruit; maximum yields come several years later. This long delay creates serious problems for farmers where a major part of the funds are borrowed and the grace period is short (typically the grace period was only 12 months for the AID financed loans).

Tree orchard establishment costs varied considerably depending on tree density and type of tree. Typically, cost for the tree and digging of the hole, 1 x 1 x 1 m is about 2 TD. Trees, digging and fertilizer involved an initial cost of about 700 TD/ha. This, coupled with the annual maintenance costs until bearing age, is likely to bring the total to 900 - 1,000 TD per hectare for apple plantations with a density of about 300 to 400 trees/hectare. About half of that cost could be family labor.

The estimates of benefits data obtained by the team on operation and maintenance of surface well irrigation systems are sufficient only to provide general indications of costs. The following are illustrative:

^{1/} Tom Cusack of OSU, in November-December, 1985, also assembled information on costs of operation and total costs of wells of different depths and yields (Table 2). He concluded that wells deeper than 40 meters were unlikely to pump economically. There is an increase in cost and risk with deeper wells, dug wells of 40 meters may prove quite economic if all aspects are well managed including water use. In fact a low producing well (5-10,000 m³) of 25 meters has higher costs per m³ than a 40 meter well producing 40,000 m³/year.

TABLE 2
PRIVATE WELLS

Cost of Irrigation Water in Central Tunisia (No Grants or Credit)
Quantity of Irrigation Water Pumped: m³ per year

		<u>5</u>	<u>10</u>	<u>20</u>	<u>40</u>	<u>80</u>
<u>10 Meter Well</u>						
Operating Cost:	Dinars/yr	121	229	444	876	1751
Total Cost:	Dinars/yr	461	569	784	1216	2431
Total Cost:	ml per m ³	92	57	39	30	30
Operating Cost:	ml per m ³	24	23	22	22	22
<u>25 Meter Well</u>						
Operating Cost:	Dinars/yr	240	454	884	1738	3476
Total Cost:	Dinars/yr	1090	1304	1734	2588	4751
Total Cost:	ml per m ³	218	130	87	65	59
Operating Cost:	ml per m ³	48	45	44	43	44
<u>40 Meter Well</u>						
Operating Cost:	Dinars/yr	376	700	1346	2640	5280
Total Cost:	Dinars/yr	3401	2725	3371	4665	7811
Total Cost:	ml per m ³	480	272	169	117	97
Operating Cost:	ml per m ³	75	70	67	66	66

Source: Field survey of small holders and interviews with CTDA staff. As reported by Tom Cusack, Nov.-Dec. 1985

Total capital cost for the most recent wells, pumps and cisterns for 2 hectares is in the range of 6,000 - 12,000 TD. The annual capital costs at 10% interest and amortization of the system over 15 years would be 1,000 - 2,000 TD total (between 500 - 1,000TD/hectare).

Diesel fuel requirements are about 1.1 liter/m³ pumped or about 400 liters of fuel (100 TD) for 5,000 m³/hectare (500 mm of water on one hectare), which is about the average single season of vegetable crops. Water requirements are estimated by CTDA to range from 2,600 m³ for greenbeans to 7,400 m³ for tomatoes (Table 3). Data on maintenance costs are not available. Labor for irrigation will probably run 50 TD/hectare/season at SMAG rates. (This may be much too high where family labor is used and the worker also does other work.) Thus, without including maintenance, costs would be 650 to 1150TD per year/hectare with one season of vegetables. If there is sufficient water the cost for two seasons of vegetables on two hectares then would be 1,600 to 2,600 (400 TD to 650 TD/hectare season).

The principal shallow well systems employed to date involve pumping into a cistern of 30-40 m³. The cistern is drained rapidly and water delivered with ditch and basin or ditch and furrow methods. The principal crops up to now have been fruits and vegetables, but some farmers also irrigate cereals and forage crops, especially intercropped with young fruit trees. The systems with vegetable crops usually involve at least weekly applications of water.

a. Expected Benefits Relative to Costs

Data in consistent form on actual farm and family benefits obtained from irrigation are not available from this project nor could the team find such data in systematic form elsewhere in Tunisia. Thus it was necessary to assemble fragmented data from several sources and by comparison to attempt to arrive at reasonable estimates of the adequacy of current and potential returns relative to costs. The newness of the surface well program and the concentration of fruit tree plantings which are just beginning to produce in very small quantities further complicated analysis as does the evidence of great price variability. The analysis was also hampered by lack of systematically assembled price data and price projections for fruits, vegetables or forage crops, the principal economic activities under the surface well program.

Fragmentary cost and benefit data were assembled from several sources: (a) team visits to farmers, (b) analyses of before and after reports on 25 individual farms prepared at the team's request by CTDA offices at the delegation level, (c) Ministry of Agriculture and IBRD estimates of irrigated crop enterprise costs and returns for other areas, (d) overall estimates, also from IBRD, of total costs and returns to irrigation investment in Tunisia, (e) experimental station returns, (f) GOT estimates of yields on

TABLE 3

ANNUAL IRRIGATION REQUIREMENTS PER HECTARE
FOR SOME MAJOR CROPS GROWN UNDER
IRRIGATION IN CENTRAL TUNISIA

<u>A. MARAICHERE</u>		
Ail	4,000 m ³	Garlic
Carotte	3,000 m ³	Carrots
Fève de saison	3,500 m ³	Broad beans normal season
Navet	3,200 m ³	Turnips
Oignon bulbe	3,800 m ³	Dry onions
Oignon vert	2,600 m ³	Green onions
Pastèque	7,000 m ³	Watermelons
Piment	7,900 m ³	Green peppers
Pomme de terre de saison	5,400 m ³	Usual season potatoes
Pomme de terre arrière saison	4,000 m ³	Late potatoes
Tomate de saison	7,400 m ³	Summer tomatoes
<u>B. FOURRAGE</u>		
Luzerne 1ère année (semis en mars)	10,000 m ³	First year alfalfa (sown in March)
Luzerne 1ère année (semis en septembre)	2,000 m ³	First year alfalfa (sown in September)
Luzerne 2ème année	10,000 m ³	Second year alfalfa
Orge en vert	5,000 m ³	Barley (cut green)
Sorgho fourrager	6,500 m ³	Forage Sorghum
Vesce avoine	1,800 m ³	Oats and vetch
<u>C. CEREALES</u>		
Blé dur	2,000 m ³	Durum wheat
Orge	2,000 m ³	Barley
<u>D. ARBORICULTURE</u>		
Olives	3,000 m ³	Olives
Abricots	4,000 m ³	Apricots
Grenadine	3,000 m ³	Pomgranates
Pêches	4,000 m ³	Peaches
Amande	2,000 m ³	Almonds
Pommes	6,000 m ³	Apples

Source: Estimates prepared by CTDA.

principal irrigated crops. Unfortunately the data are most limited (because experience is limited) for exactly the crops on which major emphasis is being placed - apples, pears and peaches.

IBRD analysis of all past irrigation investment and resulting increases in production showed a 20% gross return on investment after allowance for major cash production outlays. Project costs per hectare irrigated in the Central Tunisia program are roughly 3 times as high for PPIs as for surface wells which typically have been the main focus of GOT irrigation investment. Adding FOSDA subsidies and self-financing brings average investment costs per hectare to about 45% of the PPIs. Surface wells are estimated to gross about 15% more in value of output per hectare.

Both the GOT broader irrigation costs and return studies and the 1983 evaluation also suggest acceptable returns are likely to be received by fruit and vegetables using surface irrigation systems, as long as markets and prices continue to be at least as favorable as in the past. However, major questions center on expectations on prices of fruits as production expands (an issue raised in 1983). The availability of buyers and markets for some vegetables was noted as an occasional problem in 1983 and was reported by growers again during the 1986 visits. Table 3 shows water requirements for different crops and Table 4 provides some CTDA estimates of possible yields.

How well a farmer fares will depend on the choice of crop combinations, prices and yields he can obtain and water used. Vegetables may not always be the best possibility considering water availability, costs and risks.

TABLE 4

SOME CTDA ESTIMATES ON POTENTIAL YIELDS (MT/HA)

Broad beans (Fava)	30
Onion	50
Carrot	60
Wheat	1.5 - 3.0
Barley	45 (green fodder)
Barley vetch	45 (green fodder)
Oats/vetch	5 (dry basis)
Cucumbers	30
Potatoes	11
Maize	40 (green fodder)
Peppers	12
Tomatoes	20
Apples	12
Pears	12
Peaches	6
Olives	10

Winter cereal crops, as suggested in Table 3, might do well with 3-4 supplemental irrigations totalling no more than 200 mm; this means 5,000 m³ could be spread over 2.5 hectares. The farmers might obtain yields of 20 - 30 qx/ha (on increments of 17 to 27 qx above typical dryland yields of 3 qx/ha). At the lower level this would provide an increase of 272 TD per hectare for grain plus perhaps 150 TD for straw. This would mean an increment of 422 TD/ha or 1055 TD gross from the amount of water required on average to irrigate one hectare of vegetables, (about 1700TD from water used for one ha of tomatoes). One of the problems with such small supplemental irrigation is how to apply the supplemental irrigation water over additional hectares without incurring large water losses in delivery with a ditch system or increased costs for pipes for water delivery.

In contrast with the above, if production and particularly marketing went well, the farmer might gross 6,000 TD from a fruit or vegetable crop. Production and input costs, and risks on marketing for fruits and vegetable are likely to be much higher than for supplementally irrigated cereals. On average, U.S. vegetable farmers, who tend to specialize, averaged gross returns (during 1975-77) of over \$5,000 per hectare only on tomatoes for the fresh market. Other fresh market produce of the types grown in Tunisia averaged \$2,000 to \$5,000/ha. Value of vegetable production for processing ranged from \$600 for carrots to \$3,500 for tomatoes (Knott's Handbook, page 15).

Given the less well organized market, the market risks are likely to be substantially greater for fruits and vegetables in Tunisia, and there are the added risks of frost, drought, and hail in Central Tunisia. Still, it appears that with good management a farmer can expect to make a reasonable return in most years from fruits and vegetables where the family supplies most of the labor. Of course, as in most agriculture, the principal gain lies in the opportunity for cash income-producing employment for otherwise underemployed family members. Labor in most of the surface well irrigated farms visited was provided by the family. While men did the heavy work of digging wells and planting trees, much of the other field work (e.g. weeding and harvesting vegetables) was done by older girls and women. In some cases men were absent, reported to be away earning money to finance the operation until the trees come into production.

The family that has received a large loan and invested in a surface well suffers a competitive disadvantage compared with farmers who receive water from public irrigation systems (PPIs), since the latter generally are required to pay far less for water than even the annual operating and maintenance costs. Farming intensity and returns are reported to be higher on private surface wells, but their greater innate efficiency does not fully compensate for this water cost disadvantage. Some small farmers may compensate for the disadvantage of higher surface well water

costs by not fully repaying surface well development loans. Even if they are willing to repay many of these farmers will require rescheduling of the debt. In general, in spite of the higher cost, farmers appear to prefer surface wells to public systems. The major advantage to them is control over the water and the flexibility which that control gives them in their field operations. In Tunisia in general, private irrigation systems result in much higher intensity of use of potentially irrigable land. This appears to be the case in Central Tunisia also.

Data have been assembled by the Ministry of Agriculture and IBRD on the costs and returns from different irrigated and rainfed crops (Table 5). The real cost of water was estimated by the analyst who prepared the data in Table 5 at approximately 5-6 times the charges actually made, and that estimate may be low for surface wells using a ditch and basin irrigation application system. The costs used would at best cover the cost of diesel fuel to run the pumps at October 1980 real prices. For most of the crops listed in the Table, it would be necessary at that time to add 250-400 TD per crop hectare (depending on water required) for surface wells to cover interest and amortization costs of the wells and related equipment. This would leave net income from tomatoes (one of the higher water users during summer), probably near or below zero. Onions and peppers grown outside would show a 150-200TD/ha profit when the real cost of water is imputed. Watermelons and potatoes would be more profitable. Tomatoes and other vegetables in season offer the opportunity to market large amounts of labor. The last column shows net income plus labor cost. Crops such as tomatoes, peppers and cantalope under plastic offer particularly large opportunity for the "sale of family labor"

TABLE 5
COSTS AND RETURNS (PER IRRIGATED HECTARE)

Crop	System	Cost (TD)	Yield (MT)	Value (TD)	Net (TD)	Net + Labor (TD)
Blé dur	low level yield	57.4	2.0	14.6	-42.8	-15.1
	high level yield	57.4	12.0	87.6	30.2	57.9
Barley	low level yield	49.9	2.5	12.0	-37.9	13.4
	high level yield	49.9	7.5	36.0	-13.9	10.6
Green onion	Irrigated ^{1/}	615.0	13.0	1066.0	451.0	826.0
Pepper	Irrigated ^{2/}	973.6	1.0	1420.0	446.0	734.5
Tomato in season	Irrigated ^{3/}	861.0	20.0	1100.0	234.0	646.5
Watermelon	Irrigated ^{3/}	480.1	20.0	1540.0	1059.0	1107.9
Potatoes	Intensive Irrig. ^{4/}	679.0	28.0	1725.0	1046.0	1372.0
Tomato	Under plastic ^{5/}	10954.3	100.0	14500.0	3545.7	8924.7
Pepper	Under plastic ^{6/} local	9817.0	30.0	11250.0	1433.0	4272.0
Cantaloupe	Under plastic ^{6/}	9736.6	30.0	11500.0	1763.4	4507.4
Olives	Rainfed	101.0	1.4	126.0	25.0	90.2

Source: IBRD, Tunisian Agricultural Sector Survey, 29/9/82,
Vol. II, Tables 6-19, 23.

- 1/ Cost of irrigation not included
2/ Irrigation 9,000 m³ at cost of 54 TD included
3/ Irrigation 8,000 m³ at cost of 48 TD included
4/ Irrigation 7,500 m³ at cost of 48 TD included
5/ Irrigation 6,000 m³ at cost of 90 TD included
6/ Irrigation 5,000 m³ at cost of 75 TD included

At present fruits appear to farmers to offer the best return, and most of the new irrigated area is being planted to fruit trees with apples the most common fruit tree. Virtually all the apple orchards are being planted to golden and red delicious which are expected to be harvested from August 15 to October 1. Pears, peach and plum varieties will be harvested mainly in June and July with pears possibly extending into August. This short harvest season and lack of storage facilities are likely to create serious problems unless necessary action is taken to extend the season by a combination of planting some early and late varieties, by developing storage facilities, and by exports at peak harvest periods.

At current prices of about 500 millimes/kg, apples and pears would produce a crop valued at 6,000 TD/ha, but prices are not expected to hold at such levels as volume marketed increases. How much lower prices will be depends largely on how well marketing can be organized, on volume and quality of production, and largely as a result of these, the ability to extend the marketing season and to penetrate export markets. Compared with observations during the 1983 evaluation, estimates of future prices now appear to be more conservative and realistic.

Fruit orchards involve major costs beyond those normally incurred with annual crops. The cost of original planting is high. While original cost varies, depending on type of seedlings, spacing, or planting methods, a typical apple orchard with 300-350 trees per hectare was reported to involve an initial outlay of 600-700 TD/hectare (for seedlings, digging holes, fertilizer, and planting). Annual maintenance costs would bring the total to about 900 TD/hectare by the fourth year when initial small harvests may begin. Another major cost item is the cost of deferring income flow over the four to five years it takes for the first harvests to begin and then over the two to six year period it takes for harvests to reach peak levels. At current interest rates, the discounted real current value of an income flow beginning in year five or six is only about 60% of the value of the same income flow beginning in a few months after planting, as would be the case with annual vegetable or cereal crops. While the cost of income deferral is understood in a general way by the farmers and the CTDA staff, it is not explicitly calculated and taken into account in analysis and planning of fruit development.

Observed Costs and Returns from March 1986 Data

During the evaluation team's stay in Central Tunisia, a substantial number of farms were visited and some information obtained on inputs and outputs before and after intervention. Later, CTDA officials were requested to supply similar but more detailed data on a sample of farms. Data were supplied on 25 farms, including many visited by the team. While clearly not a representative sample these data have proven helpful in broadening our understanding of the economic and social impacts of the

program, especially, surface well irrigation. Since CTDA with some CRDA input arranged the team visits and also decided on the farms upon which to report, we must assume that there is a bias in selection toward farms with which CTDA and CRDA work more closely or with which they have a good working relationship. The absence of visits to and reporting on purely dryland interventions reflects the lower level of intervention in dryland and lower level of accomplishments. All the 25 farms on which detailed data were obtained have irrigation in one form or another, mainly surface wells with ditch water delivery (with some pipe) and furrow or basin system. However, two had established a drip system at only about 1,000 TD cost per hectare. One had installed a sprinkler system. One farmer reported being served by a PPI.

All farmers in this sample reported planting some fruit trees. The total number varied from a few trees (50 or 60) to 10 hectares. The most popular by far were apple trees with pears second, but a substantial number planted olives, apricots and almonds and some prunes and pomegranates. In most cases the irrigated area will largely be devoted to tree crops at the end of 5-6 years.

Investments reported in irrigation ranged from 900 dinars where a little deepening and pumping equipment was added to 17,000 dinars where a whole system was added including drip irrigation. Most of the systems included surface wells, pumps, cisterns, pumphouse and some pipe and cost between 3,000 and 8,000 TD with some going as high as 11,000 TD for the basic system. Those constructed most recently on average cost more than earlier ones, as was to be expected. The data do not indicate whether deeper wells yielded more than did shallow wells. Depth was partly a function of location and, where the farm land was not level, the well tended to be located on the high point of the area to be irrigated since the delivery systems were largely gravity flow even where pipe was used. Within limits farmers could locate the well lower and pipe the water to a cistern at a higher elevation.

Amounts and sources of subsidies for wells varied considerably as, apparently, did selection of recipients. It is not clear from examination of the data what the criteria were for selection of wells and credit subsidies or how they were applied. Clearly, in two or three instances people who obtained authorization for wells were not among the low income groups visualized (by AID at least) as the principal target groups. In two or three instances, the data suggested the recipient was not previously engaged in agriculture. Beyond these exceptions, most of the recipients were engaged in agriculture usually with a small area of dryland cereals, some livestock and some rangeland.

The area irrigated by systems as completely installed ranged from 1.5 to 10 hectares. Most of the surface wells irrigated 2 to 3 hectares with, in most cases, all of this to be devoted to tree crops in 5-6 years.

"Before" and "after" farm operations were examined to attempt to determine effects of the irrigation intervention on production, family income and employment. However, the data are too varied to provide more than case study type indications of direction. More seriously, there was almost no information on fruit production except on a few quintals from early-bearing trees which will reach full production in several years.

Estimates were made by farmers and CTDA personnel of the likely future productivity of trees and prices. Yield estimates (some given to the team personally during farm visits) ranged from about 20 kg/tree to 120 kg per tree and prices from 300 to 1500 mill./kg. Most estimates were a reasonable 30 - 50 kg per tree (the lower for peaches and higher for apples) with prices of 200 to 500 mill. Typically prices were estimated at 400-500 mill. for apples and pears. Most surface well operators expect 10 to 12MT/ha at maturity and typically sales of about 6,000TD/year.

Prior to having wells most farmers planted a few hectares to dry cereals (which produced 3 to 8 qx/ha yields) and kept a few animals on range and crop residues. Net farm incomes generally ranged from 50 to 400 TD/year. The most profitable farms were those with substantial flocks of sheep and a few cattle, though cattle were rare. On the high side, one farmer reported 2400 TD in livestock sales before the intervention. The scale of the livestock operation is to be reduced with irrigation. Another farmer reports 2800 TD in sales of olives (7 qx/ha x 4 ha = 28 MT at 100 TD/MT). This farmer had some irrigation prior to the intervention. Including family labor his income was about 1900 TD/year prior to the intervention. This family did what the more successful ones appear to have done in transition. They concentrated on vegetables and irrigated forage as an interim measure and achieved a substantial increase in income in the short run before trees started to bear. But then they had also been doing some irrigation before the improvement in the irrigation system.

Generally speaking the increase in net family income (including family labor) was in the range of double to 10 fold the pre-intervention income without including "speculative" returns from tree crops. This does include adjustment for interest and amortization on the irrigation systems. About 9 of the 17, based on reasonably detailed data, were making sufficient additional income to cover such costs. Another 4 might be able to cover some payment. All had made major tree planting investment which greatly increased financial outlays in early years and reduced ability to make well credit payments.

Information on labor was very poor in most cases. One of the striking aspects is the very low level of labor employed prior to the intervention, in many cases only 30-60 days per year was reported. On a few farms virtually one full time person in

herding duty was reported and labor, thus, went up to about 400 days per year. Similarly, labor required for intensive vegetable and fruit operations seems generally underestimated. It is clear that most of the irrigated fruit and intercropped vegetable systems with 2-3 ha will require virtually full time efforts of 2-3 family members. Most, however, suggested only 100-200 days of work per year. It is evident from the survey that underemployment is a serious problem in Central Tunisia. The irrigation intervention will contribute substantially in providing greater family employment opportunities and also requires some hiring of outside labor. More attention seems justified in supplemental irrigation of cereals and forage crops. Returns on forage crops were very impressive. Irrigated cereal crop yields of 20-35 qx were reported in the few cases in which cereals were reported to be irrigated.

c. Off-Farm Employment Reported in the 1986 Sample

The amount of off-farm employment reported was somewhat at variance with the usual view of high levels of workers at irrigation and off-farm employment in Central Tunisia. The selection process could have influenced this outcome in that the interventions tend to be associated with nuclear families and perhaps where the male head of the family was not regularly on site, the chance of obtaining a surface well was reduced. In any case off-farm income was substantially above 5,000 TD in two cases (a business man and professional manager). The remainder of the off-farm employment consisted of:

- o two families harvesting alfa grass with one supplying 270 person days remunerated at 1.500TD/day and the other supplying 180 days with production of 1 qx/day sold at 1,200TD/qx.
- o other off-farm employment included 1 full time laborer (200 days at 3.000TD per day) earning 600TD, one earning 500TD and a third 120TD.

d. Distribution of Income Before and After

The following Table shows the distribution of families by income classes before and after the intervention. Note the classes are not the same for pre intervention and post-intervention. Farm income includes income from labor used on the farm.

Number of Farms by Pre Intervention Income Class

<u>Class (TD/year)</u>	<u>Farm Income Only</u>	<u>Farm Plus Off-Farm Income*</u>
Under 40	1	
41 - 100	1	
101 - 300	7	
301 - 500	1	
501 - 1000	3	3
1001 - 2000	4	1
Over 2000	1	2
	<u>18**</u>	<u>6**</u>

Post Intervention Income

<u>Class TD/year**</u>	<u>Number</u>
Under 500	1
501 - 1000	3
1001 - 2000	3
2001 - 3000	4
3001 - 5000	1
5001 - 8000	4
8000 and over	0
	<u>17</u>

* / This represents a double counting since these families also are shown in the previous column for farm income only. Farms where data were too weak to draw conclusion are not included.

** / Does not include expected future income from fruit trees not yet producing nor off-farm income.

Data on irrigation investment, interest and amortization costs suggest that at least 9 of the 17 farmers (on which sufficient data to estimate returns were available) probably could afford to start to pay for their surface well development loans from crops before fruits were bearing (once they had completed paying for tree planting costs). Four should be able to pay with some additional guidance on improved operations. The remaining 4 will be heavily dependent on fruits and improvement in present operations. These data indicate that surface wells can be economically viable investments for small farmers if they are provided adequate technical help on production and if good marketing systems are developed.

Estimates also were obtained from CTDA technical personnel on

likely increases in yields under dryland conditions as a result of adoption of improved practices. These are shown below with estimated old and new gross value of production.

<u>Crop</u>	<u>Yields</u>		<u>Price</u> (TD/Unit)	<u>Value (TD/ha)</u>		<u>Gross</u>	
	Before	After		Before	After	(TD/ha)	(%)
Durum	6 Qx	13 Qx	16	96	208	112	117
Barley	4 Qx	11 Qx	14	56	154	98	175
Vetch-Oats	1.8MT	2.8MT	90	90	140	50	56
Olives	2 MT	3.5MT	60	120	210	90	75

2. Public Irrigation Perimeters

The data cited above on production and yields for surface wells generally are similar though slightly lower (an estimated 10-15%) on PPIs compared with shallow wells. Initial PPI project costs per hectare in the project turn out to be considerably higher (3,369TD/ha compared with 1,330 TD/ha for surface well credit).^{2/} Public irrigation perimeter cost varied widely depending on conditions encountered, size, etc. Charges made by PPIs range from 8 to 18 mill./m³ = 80 to 100 TD/10,000 m³. This would have been 124 TD to 160 TD for 16,000 m³ assumed above for a 2 ha/family farm using surface wells. It has been estimated that the total PPI pumping costs are 30 to 40 ml/m³ or 480 to 640 TD for 16,000 m³ for a family, and total costs are estimated to be about 75 ml/m³ or 1200 TD for 16,000 m³. Thus the implicit subsidy is 1100 TD/family with 2 ha of higher water use crops or about 3.4 crops/ha of average water use crops under the PPI system.

At the end of 1979 a total of 4665 ha were irrigated under PPI systems in Kasserine with a total of 1355 beneficiaries. During the period 1980-85, about 820 hectares were added with 506 families benefiting. The average area irrigated per family prior to 1980 was about 3.5 ha while the additions since 1985 spread 820 ha over 506 families for an average of 1.6 ha/family. The average cost was about 6,500 TD/family and about 4,100 TD/hectare irrigated. This does not include administrative, technical and operating costs of CTDA and other development agencies involved nor the cost of money during the period of development. Unlike the surface wells the Government has a continuing obligation to operate and maintain the facilities which it is calculated will cost 200-250 TD/hectare/year above that recovered from irrigation fees. The USAID contribution financed about 220 ha of the total of 1000 hectares of new irrigation realized under the PPI system in the whole area.

^{2/} Generally, credit supplied under the project covered 75% of the cost, grants 15% and self-financing 10%. Thus the implicit total cost of the surface well intervention was about 1,770 TD/ha. If only total surface well installations were included, the cost would be near 75% of the cost of the PPIs.

Opportunities and incentives for use of more efficient irrigation water application systems, discussed above, are substantially less for PPIs than under private surface wells, at least under the present methods of operation. It should be noted, however, that the PPI systems in Tunisia usually do employ some water saving methods of delivery to an individual field or groups of fields compared with the earth canal and ditch system commonly encountered in many parts of the world. Typically in the past this has included a system of concrete aqueducts or concrete pipes and inverted siphons (under roads). However, in recent years some plastic and metal pipes both above and below ground have been added to reduce costs.

Usually, water is conveyed from hydrants or other outlets near the field by open ditch to fields and applied by a furrow or basin method. Thus the losses at the final delivery and field application levels are basically the same as the unimproved surface well systems, that is, the system equipped solely with ditches for delivery from the well and furrow or basin application methods. The potential exists for major water savings by improved delivery and application methods for crops, especially tree crops, in much of the PPI area in the Central Tunisia project. Though water logging and salinity have not yet emerged as serious problems in Central Tunisia, the wasteful use of water could contribute to such an outcome in the future in an area where good natural drainage is lacking (as has already occurred in the Medjerda Valley).

3. Irrigation Using Spring Water

The project started with ambitious targets for spring irrigation development (100 springs). However, the subsequent search for springs revealed a very small number available for development for irrigation. Only some 21 were developed by early 1983 when the Irrigation subproject was evaluated. Costs per unit were low, but since it appeared that all prospects had been exhausted, the 1983 evaluation recommended use of the remainder of the spring development funds for other purposes. Most springs had been preempted for potable water or by nearby farmers for irrigation. Opportunities for development thus were limited to about 20% of the target of 100. Development of even this small number encountered structural, operational and sharing difficulties. If new areas are included under the CTDA-AID project, some additional opportunities for springs development may be found. But this is likely again to be small and similar problems are likely. While it is recommended that CTDA pursue development of springs where opportunities present themselves, no reason -- either financial or technical -- is foreseen for AID to participate in such irrigation activity. However, AID might help finance spring water development purely for potable water purposes when opportunities exist.

4. Reducing Irrigation Costs

The project is experimenting with several innovative approaches to reduce irrigation costs and extend benefits to more families. Many of these have moved beyond the experimental stage to trial on private farms or groups of farms. Given that water is the most costly and limited factor, most of the approaches are directed at reducing water losses and wastage, and extending available water over larger areas. These new approaches involve substitution of plastic or metal pipes for ditches to deliver water to the heads of fields and thereby reduce water losses. Further savings are made in the case of trees by use of hoses moved about to deliver water to individual trees or drip irrigation. Drip irrigation also is being tried, but this involves technical problems, mainly clogging from water borne debris, calcium deposits and algae. Such systems have not been adequately tested under local conditions. The hose pull or modifications of that system are not subject to the same problem and also are initially cheaper to install. Both systems used with pipe delivery offer the potential for major reductions in water losses and hence lower water costs per hectare or tree. They permit a given amount of water to be spread over a much larger area. Available data indicate these systems permit expansion in area in trees by a factor of 2 to 2.8 with a given amount of water. They provide equal or greater yield of fruit per hectare. Savings may be even greater when more is known about the consumptive use of water by each type of tree and water application can be more precisely tied to the seasonal requirements of the orchard.

Precise programming of water application involves knowledge of plant water use in relation to current weather, especially temperature and humidity to determine when and how much water to apply. In general, we probably can count on a doubling of the water use efficiency where a shift is made from a ditch and furrow system to a hose pull system, in which small basins are established around each tree or where very small vegetable basins are used and the water is applied in amounts reasonably close to consumptive needs. Application should be such that little is allowed to penetrate beyond the root zone of the crop being grown.

Precision irrigation of this type has been shown elsewhere to result in greater efficiency in fertilizer use (since less is leached away) and in higher crop yields compared with systems which over or under irrigate. The available data indicate that benefits relative to costs of improved systems are very favorable in Central Tunisia. A new surface well, pump and cistern costing 10,000 TD for two hectares involves a capital cost/hectare of 5,000 TD. Adding PVC pipe and a hose pull system would add about 400 TD/hectare but allow irrigation of 4-5 hectares from the same water for a total investment of 12,400 or 3,100 TD/hectare for 4 hectares (12,800 TD total and an average of 2560/hectare if it is possible to irrigate 5 hectares with the same water). Preliminary

evidence from the Sbeitla training center suggests an actual multiplier of 2.8 in area in tree crops irrigated with this improved system compared with a ditch conveyance system. Comparative cost requirements of an "old-style" and "new-style" system are described below.

Old System

A typical recently constructed well equipped with pump, cistern and pump house would have an investment cost of 10,000 TD interest and amortization of the well, pump and cistern 1,500 TD/year.

Pumping 16,000 m ³ (fuel, oil, minor repairs)	<u>500</u>	
Total cost of old system for 2 hectares	2,000	TD
Per hectare cost	1000	TD/year/ha)

New System

Interest, amortization of well, etc.	1,500	(as above)
Pumping	<u>500</u>	
Total as above	2,000	

Added annual cost of pipe and hose (3 year life total cost of 2000 TD for 5 ha)	767	
Total cost of new system/year	2,767	

Per hectare cost $\frac{2767}{5} = 553$ TD per ha/year

Thus the hose system will reduce irrigation water costs by almost 50% in the case of tree crops by spreading the water over 2.5 times the area.

A drip system would add at least 500 TD/hectare to equipment cost but offer little water saving over a hose system (though it would save considerable labor). However, it has not yet been proven feasible under Tunisian shallow well conditions and in most cases there appears to be family labor available to handle hoses. These improved water saving systems will generate an increase in employment approximately equivalent to the increase in area irrigated.

5. Supplemental Irrigation

Several local efforts are being made to extend irrigation over a larger area and/or increase the number of beneficiaries by substituting supplemental irrigation for intensive irrigation. Concerns over markets and possible market saturation for certain intensively irrigated crops also have acted to stimulate such efforts.

Supplemental irrigation measures differ from those discussed above to reduce water loss and permit spreading a given amount of water over a larger number of production units (trees or other plants). These approaches basically provide for full irrigation of the tree or vegetable crop.

Beyond this, several supplemental irrigation methods are being tried to increase the yield per unit of irrigation water by making greater use of rainfall supplemented by small amounts of irrigation water at critical times spread over much larger areas. The simplest and best known though not widely used is supplemental irrigation of cereals or cultivated forage. On cereals, supplemental irrigation of 5-6 cm might be applied at one to four times during the season if rainfall is deficient. These applications might be at planting to stimulate germination, at tillering, at flowering and perhaps at the grain filling. While evidence is scanty, it is generally conceded that if an area with an average of 250 mm of rainfall is supplemented by 200 mm of irrigation in a given year, this could mean the difference between an average of 3-4 quintals and 20 quintals or more of grain per hectare. If the total costs including interest and amortization for a surface well averaged 200 TD/2000 m³ (200 mm on a hectare) this supplementation would pay for itself if the increase in grain were only 14 quintals. (About one quintal of this would be needed to pay for the extra fertilizer). If value of both grain and straw are considered only about 8-9 quintals of extra grain would be needed to cover costs (discounting cost of family labor used for irrigation and harvesting).

More important however, the supplemental irrigation frequently is needed at times when there is little competing demand for the extra water, e.g. after fall watering of fruits and vegetables and before the start of new plantings. To the extent this is true, the major additional cash cost is fuel for pumping which probably would cost only about 35 TD per hectare for 200 mm of water. Less than 3 quintals of income in grain yield would be needed to cover these costs plus fertilizer. Forage (oats and vetch) and olives are the principal other alternatives for such supplemental irrigation during periods when there otherwise might be slack demand for water for the more intensive fruit and vegetable crops. Not only would such supplemental irrigation help spread total costs over a larger area and utilize labor more fully, but it also would help to reduce innate risks especially in production and marketing of perishable crops such as fruits and vegetables. These candidates for supplemental irrigation have much more certain markets than do fruits and vegetables. Cereals and olives have guaranteed markets. Straw and forage crops in a poor rainfall year are likely to command highly remunerative prices. It is estimated that Siliana is 15% short of forage supplies for its livestock and Kasserine has a deficit of 25% in a normal year.

The other principal forms of supplemental irrigation use considered involve small and infrequent applications principally for tree crops under low rainfall conditions - pistachios, almonds and in some areas pomegranates and apricots.

Unirrigated apricots and peaches are less desirable in lower rainfall areas due to their heavier water requirements, and olives, though low in water requirements, pose a special problem for Tunisia in view of increasing difficulty of entry of Tunisian olive oil into the EEC in competition with Greece, Portugal and Spain who are recent entries into the EEC. Pistachio cultivation, which otherwise appears most favorable, involves some pollination problems especially where grown in small isolated fields.

For pistachios and almonds the proposed system involves principally application of water by hand or donkey cart during the first 2 years and basically dry land operation thereafter. If water is available, and conditions justify, small irrigations might be made during fall, winter and spring in later years. Since water is carried by hand or cart no transit loss is involved and no capital investment is required in land leveling or delivery systems other than the cart and donkey estimated to cost 350 TD.

Using such a system, an area 20-30 times the area intensively irrigated can be covered and employment is at least double that of more intensive irrigation of a small area. Further, pistachios and almonds are highly storeable and involve less sophisticated marketing and less market risk. In general a surface well of about 2 liters/second might be shared by 5 or more families to serve 20-30 ha under such a supplemental irrigation system, compared with one family and 2 ha under intensive cultivation. The principal disadvantages are possible problems arising in sharing of the water and sharing of costs and operational responsibilities among several families.

6. Irrigation Development Progress in Kasserine

In 1979 there were 805 surface wells in Kasserine each serving an individual farm family (a total of 805 families). During 1980-85, 1941 loans were made for wells, well improvements, pumps and equipment to serve a total of 1331 families. Of the 1941 wells financed in part or totally, 1731 were financed by AID funds made available or held in the credit fund for reimbursement.

The number of loans exceeds the number of families since in some cases a family got separate loans for construction and equipment. The average credit was 2,660 TD/family participating and the average loan was 1,824 TD. On average each surface well supplied sufficient water using the ditch and furrow or basin method to irrigate about 2 hectares.

The potential for additional water resource development at Kasserine is quite limited. After completion of present projects in process or planned which account for 17% of the potential, only 9 million m³ (9% of the total) will remain for further development unless large additional resources are found, which seems unlikely, or recharge is greatly improved. Prospects for water development in Gafsa also are very limited.

Kasserine Water Resources Development

	Potential Deep Aquifers	Shallow Aquifers	Total
<u>Potential</u>			
Million m ³	73.9	26.4	100.3
Liters/second	2344	840	3184
<u>Amount developed</u>			
Million m ³	50.5	22.4	72.9
Liters/second	1602	710	2312
<u>Amount in process or programmed</u>			
Million m ³	14.6	4	18.6
Liters/second	463	130	593
<u>Residual</u>			
Million m ³	8.8	-	8.8
Liters/second	279	-	279

Source: DRE

73% of the ground water available in Kasserine has already been developed, 19% is in process or in projects being planned leaving only 9% left to plan for and develop.

7. Supply of Fruits and Vegetables

Up until the present, fruit crops, especially apples, pears, peaches and plums have appeared to offer the best prospects for gross and net return. However markets have not been tested for fruits. Vegetable production has on several occasions exceeded the demand, and local prices have fallen substantially. Planners and farmers clearly need to keep in mind both the possible gain and possible risks of various alternatives.

Nationally, vegetable production has been growing at about the same rate as population in the last decade while fruit production has grown at about 2.5% per capita (Table 6). More importantly, the number of fruit trees classified as immature is almost twice the number classified as mature and bearing (Table 7). Thus production will may more than triple from plantings made prior to 1985 and plans include heavy plantings in years ahead.

TABLE 6
Vegetable Production 1982-4

	Irrigated Area (000 ha)	Total Production (000 MT)	Yield (MT)	Price
Potatoes	10.3	132	13.7	137
Tomatoes	18.7	350	18.5	427
Artichokes	1.8	12.7	7.4	-
Green Peppers	18.9	113.3	6.1	171
Melons - Watermelons	14.5	310	11.9 ¹⁾	239
Other	24.8	330	121	-
<u>TOTAL</u>	91.7	1248 ⁽²⁾		

(1) Yields for melons-watermelons have dropped recently because the amount planted under dryland conditions has increased from about zero before 1981 to about 13,700 ha. 1984. This is almost the same as the area irrigated.

(2) 1975 total vegetables were 930,000 MT
1982-4 total vegetables were 1,248,000 MT

Fruit Production (000 MT)

	<u>1975-76</u>	<u>1983-84</u>
Olives	669	512.5
Citrus	147	179.0
Wine grapes	112	72.5
Table grapes	22	40.0
Almonds	24.5	39.5
Apricots	27	19.5
Dates	53.5	66
Other	<u>75</u>	<u>144</u>
<u>TOTAL</u>	349	488.5

Total excluding olives for oil and grapes for wine.

Source: CTDA documents

TABLE 7
FRUIT TREES
In Production, New and Old Trees
1984-1985

	<u>In Production</u>	<u>Number of Trees Newly Planted</u>	<u>Old Trees</u>
Apples and Pears Total	1,266,300	2,287,300	73,200
Center & South	257,600	597,200	3,200
Apricot Total	298,900	65,900	243,000
Center & South	229,200	41,400	7,200
Pomegranate Total	1,241,200	572,400	25,400
Center & South	720,900	347,200	25,100
Table Olives	96,900	318,100	7,200
Oil Olives	2,095,600	226,600	61,300

Source: CTDA documents

Model Farm Estimates of Costs and Returns

CTDA has prepared estimates on gross production and variable costs and margin above variable costs for different crops, using a model farm approach with plans for 1.5 ha and 4.0 ha size irrigated units. The highest estimated gross rates of return per hectare are for cold season irrigated vegetables and warm season irrigated forage (about 1200 TD/ha). Next are fruit trees and cold season forage (1000 TD/ha) followed by warm season irrigated vegetables (400). Supplementally irrigated dryland tree crops are lowest in returns above variable costs (See Chapter IV). Forage crops and cereals crops should be accorded additional priorities in view of their generally lower market risks. The lower return of crops such as warm season irrigated vegetables would be marginal if the full costs of water were deducted.

D. WATER DEVELOPMENT PROCESS

1. The Shallow Well Development Process

Shallow well development as noted above has the most private orientation of any of the water interventions. The process overtly starts with the individual taking the initiative in proposing a shallow well for personal use. In practice, however, the process starts much earlier with publicizing and promotion of this and other programs by various government agencies and political leaders. As explained by CTDA and other agency personnel, there has been an explosive demand for project assistance. As a result the planning and promotion has become largely a matter of responding to requests and making hard choices on allocation of water resources and financial assistance.

The first step in shallow well development usually is for the farmer to go to CTDA or BNT or some other entity indicating the desire for a shallow well. Second, MOA and CTDA do a study of the physical feasibility with respect to water depth, quality, likely flow, etc. Within the MOA, this determination is the responsibility of DRE (formerly DRES). Third, the farmer must show some acceptable form of possession. Now a certificate of possession is accepted as adequate. Certificates of possession are issued by the Office of the Governor after review of the circumstances. Testimony by the farmer's neighbors (appearing as a group) may be accepted as adequate evidence for issue of a certificate of possession. Fourth, a request is prepared by or on behalf of the farmer listing existing land, land use, livestock, other resources along with personal information, e.g. family members, etc.) Fifth, a committee composed of the representatives of CTDA, BNT, CRDA, (DRE, Extension, PDR), FOSDA, and the Farmers Union reviews the documents and passes on the request.

If approved, the request includes a loan of usually 75% and FOSDA grant of 15% of the total estimated cost. The farmer is required

to put up 10% of the total costs in cash or kind (e.g. labor). The 1983 evaluation noted that farmers may obtain a grant of up to 100 - 150 TD from CTDA in addition to the FOSDA grant of 15% (Page 82-84). This CTDA grant now may be as much as 200 TD.

From the approval step on, CTDA provides most of the supervision and technical assistance in digging and lining of the well, construction of a cistern and pump house and installation of equipment (pump and pipe). DRE monitors digging with respect to water quality, flow, and static head; this information is used in final system design. The actual digging and lining of the well, and cistern and pumphouse construction are either contracted for by the farmer or done by him with family or hired labor. Equipment is purchased locally and installation arranged by the farmer. CTDA assists as needed in this process. BNT advances the loan funds on the basis of a pre-agreed schedule. Monitoring of civil construction is largely a CTDA task.

Once the system is completed and ready for use, technical assistance (extension) is provided by CTDA, commonly with participation of representatives of CRDA. The specific role of CTDA and CRDA varies somewhat from one situation to another. Usually, CTDA deals with irrigation operations and vegetables and irrigated forage and CRDA with fruits and cereals.

2. Potable Water Development Process

The principal agencies involved in rural potable water projects are CTDA, PDR, CRDA and SONEDE. Any of these can undertake a potable water development activity.

The initiative for a potable water project usually starts at the beneficiary or lower level political level - the Omdah, Délégué or Governorate. Officials at these levels usually meet to agree on priorities for different areas. They then approach one or more of the potential implementing agencies. DRE is contacted concerning possible water availability, depth and quality. The agencies decide who will be principally responsible for the development. A study is carried out to determine the likely number of beneficiaries and costs.

In the case of CTDA/USAID projects, CTDA does the drilling itself if the depth is under 200 meters (the limit of the USAID provided drilling equipment). If DRE indicates it will be deeper a contract is made with a private company. DRE monitors drilling and conducts tests of the water for quality, flow and static head which provide the basis for decisions on pumps, cisterns, etc. - the equipping is done by the responsible agency directly (e.g. CTDA for USAID-funded projects). When the system is functioning it is turned over the PDR (OEM) to operate. However beginning in 1984, efforts were being made to establish water user associations to collect user fees and maintain and operate the potable water facilities. A

meeting was held in March 1986 with SONEDE concerning the assumption of responsibility by SONEDE for operation and maintenance of rural potable water points including, when possible, organization of water user associations. SONEDE currently has responsibility for piped water systems in towns.

3. Development of Public Irrigation Perimeters

The principal agencies involved in implementation of Public Irrigation Perimeter (PPI) development projects are CTDA, DRE and CRDA. As with shallow wells DRE makes the initial determination on availability of water resources - amounts, quality and depth of wells. Water for PPIs developed in Central Tunisia comes mainly from deep drilled wells. DRE approves the allocation of ground water. Where water is pumped from rivers, or dams are constructed, EGTH is involved in planning and approvals. In the case of the USAID-funded PPIs, a team composed of GOT (including DRE) officials and team members from the US conducted a survey of Central Tunisia in advance of the project, to identify and evaluate possible PPI locations. DRE conducted extensive drilling of test wells in connection with this planning exercise.

Either CRDA or CTDA can execute a PPI project. A project is conducted at the outset to estimate costs and beneficiaries and ascertain the degree of interest of potential beneficiaries. The drilling of wells normally is contracted with DRE monitoring the process and testing water with respect to quality, flow, static head, etc. In the case of CTDA-USAID PPIs, CTDA contracts for the drilling and is responsible for the civil works and installation of pumps, pipes and distributory systems. CTDA takes over responsibility for operation and maintenance of both CRDA and CTDA developed PPIs.

Extension service responsibilities in PPIs are shared by CRDA and CTDA with CRDA mainly responsible for field crops and tree crops and CTDA responsible for irrigation operations at the farm level and for vegetable crops and irrigated forage. CRDA's responsibility for cereals, legumes and tree crops, and forage grown under rainfed conditions parallels its responsibilities outside the irrigated areas. Vegetables are new and basically tied to irrigation as, by definition, are irrigated forage crops such as oats, vetch and luzerne which otherwise are new to the area. Thus it is logical for CTDA to provide production extension services for these in connection with the irrigation extension service.

E. ECONOMICS OF DRYLAND INTERVENTIONS

Thus far the project has not been successful in defining economic parameters of alternative dryland interventions. A substantial number of cereal trials has been run and soil samples have been taken which were to be correlated with fertilizer response data. However, the team was unable to locate data from reports that would

permit conclusions on the economics of alternative fertilizer application rates. Data were not available for trials of 1982/83 and 1983/84. This information was reported not yet to have been returned from Oregon State University. Data from 1984/85 were available from the R. Smith, W. Grealish July-December 1985 semi annual report. Wheat yields on plots ranged from 14.0 to 31.1 Qx/ha of grain and from 44.4 to 78.6 Qx of grain and straw combined. Barley grain ranged from 3.4 to 35.5 Qx and combined barley grain and straw from 10.9 to 109.1 Qx/ha. Mylene Bohlen's report on the cereals fertilizer trials in 1985 suggested that the best fertilizer applications rate for durum wheat in 1984/85 was 51 Kg of N and 45 Kg of P₂O₅. The top levels of phosphate may have been limited in N response since phosphate deficiencies appear (from soil tests) to be common.

The marginal returns appear to have been as high as 15 TD/Qx of grain plus straw (for feed) on this level of fertilizer (about 270TD per ha, with fertilizer cost of about 20 TD by the time it was applied). This suggests a marginal return of as much as 13 TD in output for each one TD spent on fertilizer. This, if correct, is extremely favorable. Of course, 1984/85 was an unusually favorable year in terms of rainfall.

The increases in barley and straw related to fertilizer application were less impressive than for wheat. The highest yield of grain and straw was 52 Qx with 67 Kg of P₂O₅. This was 10 Qx more than the control with no fertilizer. This provided about 90TD increase in value of output for about 12TD invested in fertilizer and its application for a MR/MC of about 7.5 to 1. However these are not the kinds of yields farmers can expect on normal yields.

Data from the trials indicate that fertilizer probably will give a positive response in most years, probably a sufficient response on average to justify use of fertilizer, despite the risks, at levels of N of 30-60 kg, and P₂O of 30-60 kg. However, there is sufficient uncertainty about specific needs for N and P under different circumstances to require more and better research and soil testing.

When adequate data are available on soil test/fertilizer response, correlation of fertilizer needs can be more accurately applied. Several more years of on farm trials will be needed to establish soil test/fertilizer response correlations and economic data. In the meantime CTDA should undertake local analysis of the results of on farm trials to avoid the long delays in the OSU analytical process. The current system of dependence on Le Kef and OSU appears not to provide the timely and reliable data CTDA needs.

Data from CTDA showed that 480 ha of demonstrations of dryland cereals have been carried out in Kasserine and 24 ha in Siliana but yield results were not available.

F. RANGE AND LIVESTOCK MANAGEMENT

The Range Management project started later than other activities designed to support the Central Tunisia development effort. The contribution to Central Tunisia has been somewhat restricted by location of the principal project site in Kairouan about 120 km from the CTDA main office in Kasserine. In the approximately 4 years of operation the Range Management project has made notable progress in testing technical and economic feasibility of improved range land use and dissemination of improved range practices. Approximately 4,000 hectares of range land have been improved under the project with about 25% of that in the CTDA area. The Range project works both with CTDA and with CRDA personnel.

Trials and interventions under the Range Management Project and livestock include:

- o Planting of cactus
- o Seeding with annual forage legumes, principally medicagos
- o Trials with perennial forage legumes
- o Resting, recovering and controlled grazing of range
- o Reseeding with grasses, forage trees and shrubs, principally acacia and atriplex
- o Protection from grazing and natural recovery
- o Health improvement measures and genetic improvement for sheep

In general in the past OEP through its range management activities has concentrated on the traditional forage plants while the Forestry Service has concentrated on trees and shrubs. The two services have differed somewhat in their approach to management. The Forestry Service tends to follow the practice of protection of planted areas from both plants and animals, and harvesting of trees, shrubs and cactus, and transporting material harvested away for consumption. In contrast the OEP and the range management project personnel have been working more with controlled grazing or at least the principle of controlled grazing. The range management project has extended the OEP domain somewhat to include some plants more commonly included under forestry (e.g. acacia, atriplex, spineless and spiny cactus).

The Range Management Project has demonstrated substantial concern with economics of alternatives it might disseminate and is making a serious effort to collect and analyze economic data. As the Director noted, "the farmers are so poor it is of paramount importance that we fully understand the economics and risks of whatever we propose to recommend". Some of the economic data emerging from the project are discussed below. The reader should be cautioned that the project is quite new and with more years of experience and on-farm testing, some of these results could require significant modification.

1. Planting of Cactus

Planting of cactus thus far is the most popular of the interventions - and one which substantially predates the Range Management Project. The project is producing economic data and working on management within a limited grazing regime. It is working with both spiny and spineless cactus (the spiny cactus requires hand harvesting and removal of the spines mechanically, or by burning before feeding). Costs of planting are currently estimated to be about 100 TD/hectare including the cost of deferred land use of 2-3 TD/year/ha in Central Tunisia. Where annual guarding costs, estimated at 5 TD/year prior to harvest are required, total cost is about 115TD/ha by the 4th year. After harvest age gross returns are estimated at 30 TD/year less 5 TD for guarding (or 10 MT at 3TD/MT). In many instances the guarding may not be required and in most cases guarding would be done by family labor^{3/}. Similarly over half the planting cost is estimated to be labor (50TD for planting out of 98TD where no guarding is required).

The above returns are based on feeding in a normal year. However, the principal value of cactus is its ability to serve as a feed reserve in case of drought. In 1986 the price of cactus has risen from 3 to 10 millimes or more per kg. In such a situation the farmers' returns are greatly enhanced. Even at the lower figure of 3 millimes/kg, the internal rate of return is estimated at 16% from cactus planting without guarding or 12% with guarding. If the assumption is made that the planting is done with family labor not otherwise gainfully employed and guarding similarly provided by family, then the internal rate of return to the family is greatly increased. The principal costs would be fertilizer and pad for planting (24 TD) and deferred use of the land for a total of 32 TD which would be remunerated by an increase of cash flow of about 1,000% per hectare after maturity (from 2-3 TD to 30 TD/ha/year) even at lower, normal year, prices. At the upper end of the income spectrum, the farmer might sell his cactus in a drought emergency year for 4 times this price and harvest an accumulation of several years' growth. In March 1986 a year's growth was worth about 100TD/ha and the value may go higher since there is little available.

3/ Cactus has close to 10% dry matter and the dry matter is estimated to have a nutritive value (considering palatability, digestibility, protein etc.) of about 35% of that of barley. Hence one hectare would produce about 350 UF/ha/year (equivalent to 350 kg of barley). In Gafsa with about 250 mm of rainfall, the production of cactus was estimated to be near 600 UF equivalent per hectare. This difference, though it appears large, could be explained by differences in estimates of total yield and in the factor used for adjustment from tons of cactus to U.F. equivalent. In the following section the lower, and we think more reliably estimated, figures are used.

There also are substantial ecological advantages including reduced wind and water erosion and possibly increases in ground water recharge. The cactus pears provide an additional edible product; no data are available on the value of cactus pears. The project has noted another advantage not yet quantified with cactus planting and protection of the area. This is the natural recovery of useful indigenous range species along cactus rows which, with controlled grazing, can continue to be harvested. The value of these has not yet been quantified^{4/}.

The Range Project has tested and adequately demonstrated the technical and economic feasibility of cactus planting to justify a large scale program to expand planting and improve management of cactus as a regular feed supply and as an emergency feed reserve in drought years. Major financial requirements for an expanded program are funds to help farmers buy planting materials (pads), prepare the land and plant, and to help very low income families to deal with the costs of deferred land use during the 3 to 4 years until the cactus can be harvested.

Despite commendable progress there is need for more research on cactus as a forage plant. One of the areas not presently included which requires attention is testing of different varieties or mutants of spiny and spineless cactus for drought and cold tolerance, and for yield and nutritive value under different moisture, soil and fertility conditions, and for resistance to grazing and disease. This also should include study of planting methods and costs for different varieties.

2. Medicago

The project has encountered difficulties from poor farmer management of perennial legumes. The principal problem is that there is little else to graze at the critical stage when the plant should be replenishing energy in the roots for the next growth cycle. As a result farmers graze the perennials at this stage and plant recovery has been poor. In contrast planting of annual medics has resulted in good yields despite heavy grazing. Annual planting costs are about 75 TD/ha and yields generally were reported to be 2,500 to 3,000 kg of dry matter.

During the very favorable 1984/85 summer the yield in some plots was 3 times this level (9,000 MT of dry matter with 455 mm of rain well spaced). Medics have a feed value of over 50% of the level of barley on a dry material basis; hence a 2,500 kg yield should have a value of at least 150 TD/ha. This would give a 70-80 TD/ha net above planting cost in the first year after planting. Project personnel report that sufficient ungerminated seed may exist for a second and sometimes even a third year of growth without replanting. In 1986 with the shortage of forage, prices are much higher but at this time (April) it is not clear how large yields will be.

^{4/} Data for this section were supplied by the Range Management Project staff.

3. Ammoniation of Straw

Another major activity under the project is ammoniation of straw to increase the digestibility, palatability and protein level for ruminant livestock. This consists simply of tightly covering baled straw with plastic and injecting an amount of ammonium (NH₃) equal to 3% by weight of the straw. This was reported to cost 25 and 30 TD/MT (NH₃ 6-9 TD, plastic 12 TD, and transport and other costs 5-10 TD).

The nutritive value is reported to increase from about 20-25% of a UF (Kg) to up to about 55% of a UF (Kg). Barley is about 120TD/MT. This would be an addition of about 35 TD for an investment of 25-30TD. The effective protein content, when fed to ruminants, increased from about 3% to about 10-12% which makes it comparable to barley on that scale. Palatability increases somewhat resulting in less waste. Fed along with a low protein feed like cactus, the added protein should increase the value by about 15 TD/MT, (based on relative maize and soybean meal prices). In a year such as 1986 when forage is in very short supply, the value of any forage is much above normal and above what the nutritive value relative to barley at the official price would suggest. Currently the increase as a result of ammoniation is estimated to be about 65 TD. Ammoniation of straw appears promising, especially in poor forage years but it still requires more effort to establish its suitability for general use. As currently practiced ammoniation appears to be suitable primarily to larger farms despite the project subsidy in costs for farmers with below 500 bales. The charge is 15 TD/MT, for less than 500 bales/year, and 25 TD/MT for over 500 bales.

Another problem is that the market does not yet recognize the full value of ammoniation in a serious, forage-short year, as indicated by prices farmers are willing to pay.

COUT EN DINARS DE LA MATIERE, LA MATIERE SECHE
DE L'UNITE FOURRAGERE ET DE LA MATIERE PROTEINIQUE
TOTALE POUR LES DIVERS TYPES D'ALIMENTS

<u>ALIMENTS</u>	M (TD/Kg)	MS (%)	MS (TD/Kg)	UF/Kg de MS	MS (TD/Kg)	Proteïne (TD/Kg)
1. Foin de Vesce- Avoine	.175	90	.194	.45	.432	2.778
2. Paille traitée NH3	.107	90	.119	.50*	.237	1.077
3. Paille	.077	90	.085	.20	.426	2.130
4. Concentré No.5	.125	90	.139	.90	.154	1.157
5. Son de blé	.080	90	.089	.64	.139	0.500
6. Foin d'avoine	--	90	--	.30	--	--
7. Orge (Graines)	.120	90	.134	1.0	.134	1.114
8. Cactus (Verte)	.013	10	.125	.50	.250	3.676
9. Acacia cynaophylla	--	50	--	.60	--	--

Légende:

M	Coût actuel de la matière
MS(%)	Pourcentage actuel de la Matière Sèche
MS	Coût de la Matière Sèche en TD/Kg
UF/Kg	Répartition du facteur de digestibilité
MS	Coût équivalent d'une unité fourragère
Proteine	Coût d'un Kg de protéine

Source: Projet de Parcours/Kairouan

*/ En valeur estimative

4. Trees and Shrubs for Forage

The project is principally testing and promoting two varieties of trees/shrubs for forage. These are acacia, a leguminous tree and atriplex, a shrub.

Planting of acacia costs about the same as cactus - 100-115TD/MT if 100% stand could be obtained. However, experience to date indicates that obtaining a good stand is difficult even with some irrigation to start trees. Mortality may run as high as 40% thus establishment of a stand well may cost twice the amount it costs for cactus (200-250TD/ha). Planting material for atriplex may run as much as 4 times the cost of cactus and acacia for the initial planting because of the much higher rate of plant density required. Thus at a minimum costs are likely to be at least 2,200 TD/ha and if there is a high level of mortality, which is common, it may go much higher.

Productivity of acacia and atriplex in favorable years rivals that of cactus in terms of digestible dry matter but protein levels are much higher. Typically cactus has under 2% digestible protein (as a per cent of dry matter) while acacia is likely to have 12% and atriplex 16-17%. Cactus has a natural resistance to drought in that respiration may virtually cease during the heat of the day. This is not true of acacia and atriplex. Thus the latter are not as good as a forage reserve. Cactus and acacia or atriplex are complementary as forage. These plants like cactus can be used to reduce wind and water erosion and possibly to increase ground water recharge. Acacia planting in 5 to 10 meter grows can be interplanted with medics and recovery of natural range plants during the 3-4 years of protection before harvest starts may add to the total returns. Available data indicate that planting of acacia and atriplex is feasible though not as economic as cactus in many situations.

Other interventions under the project include:

- (1) Oats - vetch and barley hay;
- (2) Health care for livestock including vaccination;
- (3) Provision of improved strains of sheep.

Economic data were not available on these interventions.

ANNEX C

PROJECT SUBACTIVITY ANALYSES

A. RURAL EXTENSION AND OUTREACH SUBPROJECT 664-0312.9

The purpose of this subproject is stated as: "Effective communications systems established between rural population and public sector purveyors of information services in such fields as agriculture, health, family planning and other CTRD disciplines."

The technical interventions proposed to achieve this purpose were firstly to establish an Extension Support Services Unit (ESSU) and secondly to upgrade the existing agricultural extension service of CTDA.

The AID inputs were the provision of resident advisors in the form of one extension advisor who has been at CTDA from September 1982 to date; an extension communications advisor who was at CTDA from 1st June 1982 to 1st March 1984; a dryland cereals agronomist from August - December 1984 and June - August 1985; an irrigation advisor who joined CTDA October 1984 and is still with CTDA; and two Peace Corps audio-visual assistants who joined the staff on 1st December 1985.

In addition there were visits by a number of consultants:

- o Dr. N.S. Mansour: Dept. of Horticulture, OSU
15th Sept. - 14th October 1983;
- o Dr. G.A. Klein: Sociologist, OSU
17th Nov. - 12th Dec. 1983;
- o Mr. B.L. Johnson: Electronic Media Specialist, OSU
22nd Sept. - 20 Oct. 1984;
- o Dr. M.N. Shearer: Agric. Engineering Dept., OSU
2nd Nov. - 1st Dec. 1984;
- o Dr. M.N. Shearer: Agric. Engineering Dept., OSU
16th-31st March 1985;
- o Dr. N.S. Mansour: Dept. of Horticulture, OSU
18th March - 23rd April 1985;
- o Dr. M.N. Shearer: Agric. Engineering Dept., OSU
1st -30 September 1985;
- o Dr. T. Cusack: Agricultural Economist, OSU
Nov. - Dec. 1985.

There are also 3 Peace Corps members who work with the sub-divisionnaire in three delegations, Sbeitla, El Ayoun and at Foussana (Sept. 84 to present).

Audio-visual equipment was provided valued at \$230,000, of which about half went to Division d'Education, Recherche et Vulgarisation (DERV) at Tunis.

Five Tunisians went to Oregon State University for Masters Degree Training and are expected to return shortly. These are:

	<u>Departed</u>	<u>Expected to Return</u>	<u>Area of Study</u>
Abbès	October 1983	April 1986	Vegetable Production
Abdelli	October 1983	June 1986	Irrigation
Hamdi	March 1984	September 1986	Sheep Production
Meddousi	March 1984	September 1986	Apple Production
Tobbi	March 1984	September 1986	Soil and Water Conservation

Of these trainees all except the second are expected to return to CTDA.

Training was also given to existing staff:

- o Short term training out of country (1982 through 1985) totalled 43 weeks and 57 persons. Training was given in U.S., Egypt, France, Spain and Holland. Short term training in-country, 1983 through 1985, totalled 112 days and 139 persons.
- o In-service training seminars, 1982 through July 1985, totalled 50 days and involved 895 persons.

The above training included all aspects of appropriate technical agricultural production techniques and extension methodology.

The staffing of the extension service, as stated in the Project Paper, at the outset was 48 agents. This included five specialists in irrigation but who previously had no training in agronomy or water management, eight horticultural agronomists with some irrigation expertise but no water management background, and five livestock specialists. This group of 18 served a backstopping or specialist role to the other 30. The rest of the staff at that time were generalists and were the cadre in direct contact with the farmer.

The tasks of the ESSU were stated in the Project Paper to be:

- o Provide technical assistance to field agents and supervise delivery of extension, health education and other rural development packages;

- o Act as a forward and backward linkage between research efforts and beneficiaries concerning new techniques and practices;
- o Coordinate all extension activities in the region;
- o Develop new technology information packages, especially for Central Tunisia, and arrange for their production by the central Ministry of Agriculture audio-visual unit.

The agricultural expertise in ESSU was proposed to be in agronomy, animal production and range management, water resources management, and agricultural economics. In health it was intended that the expertise would initially be in health education and preventive medicine.

In fact the extension service confines itself to agricultural extension and does not provide educational outreach in health or family planning.

Currently, there are five Tunisian staff members in the Extension Unit only one of whom is an ingénieur agronome. He is currently preparing his Masters thesis, with speciality in arboriculture. This person is head of the division and has been with CTDA for some two years. Three other members of staff are ingénieurs adjoints (baccalaureate and 2 years at an agriculture college), one specializing in mechanization and one in livestock; one is a generalist. The fifth member of the ESSU is classed as a storeman but has had several years experience with the expatriate audio-visual specialists and has been recommended (without success) for further training in this field.

Clearly, the Unit relies very heavily on the expatriates in the form of the long-term advisors, consultants and Peace Corps volunteers until the Tunisians return from the U.S.

Most notably missing in the ESSU is a capability in agricultural economics and rural sociology, as had been originally proposed. This will not be remedied by the returning Masters graduates, nor is there any current proposal to recruit appropriate staff.

A great deal of effort has gone into training field agents as well as headquarters staff in a wide range of topics. Farmer information days have also been a regular feature of the ESSU program. Together with demonstration plots and the trials and demonstration farm at Sbeitla, the educational aspect of the subproject is impressive. Table 1 lists the training given and Table 2 the location, number and costs of demonstration plots. As a result of these programs the CTDA has built up a team of field agents with a good general training.

Table 1

LONG-TERM TRAINING - OUT-OF COUNTRY

<u>Date of Report</u>	<u>Prog. No.</u>	<u>Subject</u>	<u>Duration of Training</u>	<u>Approx. Date</u>	<u>No. of Participants</u>
7/83	6	Horticulture (OSU)	30 mos.	9/83-05/86	1
7/83	6	Agricultural Engineering (Irrigation) (OSU)	33 mos.	9/83-06/86	1
1/84	9	Livestock (OSU)	30 mos.	3/84-10/86	1
1/84	9	Horticulture (OSU)	30 mos.	3/84-10/86	1
1/84	9	Soil & Water Conservation (OSU)	30 mos.	3/84-10/86	1

SHORT-TERM TRAINING - OUT OF COUNTRY

7/82	2	Irrigation (OSU)	2 weeks	7/82	6
7/82	2	Communications (OSU)	2 weeks	7/82	2
7/83	6	Language Training (OSU) Sheep Management and Range (pasture) Evaluation and Improvement (OSU)	2 weeks	6-8/83	1
7/83	6	Crop Science, Animal Science and Extension Methods (OSU)	4 weeks	8-9/83	5
1/84 7/84	10) 17)	Rural Extension (Wageningen, Holland)	4 weeks	6-7/84	5
1/84	10	Tree Fruit Nursery (France) Production (Spain)	3 weeks 4 weeks	5/84 6/84	8 6
1/84 7/84	10 17	Agricultural Production & Extension (OSU)	4 weeks	8/84	10
1/85	10	Rural Extension Course (Wageningen, Holland)	4 weeks	6-7/85	2
1/85	10	Machinery Operation-Maintenance (Threshers & Reapers) (Cairo, Egypt)	2 weeks	4/85	2 from CTDA
1/85	10	Agricultural Production & Extension (OSU)	4 weeks	5-6/85	5
1/85	10	Agricultural Production & Extension (OSU)	4 weeks	9-10/85	5

Date of Report	Prog. No.	Subject	Duration of Training	Approx. Date	No. of Participants
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SHORT-TERM TRAINING - IN-COUNTRY

1/83	2	Crop Treatments - Pest Control (Saida)	6 days	1/83	8
1/83	2	Animal Health (Sidi Thabet)	6 days	3/83	6
1/83	2	Fertilizers & Their Use (Saida)	6 days	4/83	5
1/83	2	Extension Teaching Methods (Moghrane)	5 days	5/83	7
1/83	2	Farm Management	5 days	5/83	5
1/83	2	Harvesting Potatoes (Saida)	6 days	5-6/83	8
1/84	9	Culture of Forage Crops (Saida)	6 days	3/84	8
1/84	9	Land Leveling & Soil Preparation (Saida)	6 days	4/84	6
1/85	10	Improved Grain Harvest through Utilization, Operation & Maintenance of Threshers & Reapers	3 days	5/85	6
1/85	11	Beekeeping & Management Training (Sbeitla)	3 days	3/85	15 agent techn. 20 farmers
7/85	22	Communications (3 sessions) (Saida)	18 days		15
7/85	22	Vegetable Nursery Production (Saida)	6 days		6
7/85	22	Forage Production (Saida)	6 days		6
7/85	22	Potato Production (Saida)	12 days		11
7/85	22	Mechanizing Soil Preparation (Saida)	6 days		7
7/85	22	Improved Irrigation Techniques (Saida)	12 days		13

Date of Report	Prog. No.	Subject	Duration of Training	Approx. Date	No. of Participants
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SEMINARS (IN-SERVICE)

7/82	3	Orientation & In-Service Training for ESSU Team	-- See Entry		
7/82	3	Chemical Use Seminar	-- See Entry		
1/83	2	Ext. Meth., Tech. Trng	1 day	1/83	39
1/83	2	Ext. Meth., Tech. Trng	1 day	2/83	30
1/83	2	Ext. Meth., Tech. Trng	1 day	3/83	27
1/83	2	Ext. Meth., Tech. Trng	1 day	4/83	30
1/83	2	Ext. Meth., Tech. Trng	1 day	5/83	32
1/83	2	Ext. Meth., Tech. Trng	1 day	6/83	38
1/83	2	Irrigation - Plant-Water Relations	1 day	1/83	32
1/83	2	Sheep Management	1 day	3/83	27
1/83	2	Dryland Cereal Production (El Kef)	1 day	4/83	28
7/83	4	Socio-Economic Seminar	9 day sessions	During this reporting period, averaged 28 per day	
7/83	5	Vegetable Variety Evaluation and Technical Training			
1/84	10	Soils, Agronomy & Plant Production	1 day 1 day 1 day	3/84 3/84 4/84	
1/84	10	ESAK Research Program	1 day	3/84	
1/84	10	Production Techniques on Potatoes (Foussana)	1 day	2/84	16 agents
1/84	10	Potato Production Meeting (Sbeitla)	1 day	2/84	20 agents 21 farmers
1/84	10	Control of Apple Insects (Sbeiba)	1 day	4/84	35 agents 10 farmers
1/84	10	Basic Insect Control & Pesticide Safety (Sbeiba)	1 day	5/84	15 agents

Date of Report	Prog. No.	Subject	Duration of Training	Approx. Date	No. of Participants
1/84	10	Apple Worm Control & Pesticide Safety (Sbeiba)	1 day	5/84	3 agents 12 farmers
7/84	18	International Seminar Sponsored by ESAK - Dryland Cereal Production	5 days	7/84	25 agents
7/84	18	International Range Improvement Seminar	3 days	11/84	23 agents
7/84	18	Agent Training	1 day	7/84	15 agents
7/84	18	Field Day - Sbeitla	1 day	8/84	36 agents
7/84	18	Dryland Cereal Production/Demonstration Methods	1 day	8/84	36 agents
7/84	18	On-the-farm Irrigation	1 day	11/84	39 agents
1/85	11	Apple Production/Insect Control (Sbiba)	1 day	5/85	25
1/85	11	Apple Production-Pest Control (Sbiba)	1 day	6/85	12 agents
1/85	11	Farmer Information Days Irrigation Field Day (Feriana)	1 day	4/85	6 agents 19 farmers
1/85	11	Irrigation Training Day (Sbeitla)	1 day	4/85	30 16 agents
1/85	11	Irrigation Training Day for Farmers (Sbeitla)	1 day	4/85	25 farmers
7/85	22	Tree Fruit Pest Control & Pesticide Safety	1 day		40
7/85	22	Cereal Culture - Fertilizers - Varieties - Diseases	1 day		43
7/85	22	Cereal Diseases	1 day		40
7/85	22	Planning & Management (3 sessions)	3 days		153
7/85	23	Farmer Information Day			

Table 2

PARCELLES DE DEMONSTRATION
(Campagne 1985)

Deuxième Semestre

<u>Spéculation</u>	<u>Nombre ou Superficie</u>	<u>Cout en Dinars</u>
<u>I. Arboriculture</u>		
(1) <u>Entretien</u> (1 Ha.)		
- Pommiers	13	3.900,000
- Poiriers	12	3.600,000
- Pêchers	12	2.880,000
(2) <u>Création</u> (1/2 Ha.)		
- Pommiers	13	5.944,627
- Poiriers	07	3.150,000
- Pêchers	05	1.500,000
- Pruniers	03	750,000
- Grenadier	<u>04</u>	<u>1.000,000</u>
S/Total	69	22.724,627
<u>II. Culture Maraichere</u> (1/4 d'hectare)		
- Pomme de terre d'A. Saison	08	2.300,000
- Artichaut	05	1.000,000
- Ail	10	4.500,000
- Fraisier	04	1.200,000
- Choux	03	225,000
- Fenouil	03	300,000
- Tomate	08	1.899,200
- Piment	08	1.766,520
- Melon	06	840,000
- Pastèque	05	955,750
- Concombre	03	480,000
- Aubergine	03	225,000
- Petit pois	<u>08</u>	<u>760,000</u>
S/Total		

III. Cultures Fourragères
(1 Ha.)

- Vesce-Avoine	170 ha	19,181,000
- Orge en vert	166 ha	18.460,860
- Luzerne	<u>6 ha</u>	<u>2.400,000</u>
S/Total	342 ha	40.041,860

IV. Grandes Cultures
(1 Ha.)

Essai de fertilisation
et de comportements
variétaux pour:

- Blé	7	700,000
- Orge	<u>10</u>	<u>800,000</u>
S/Total	17	1.500,000

Linkages with farmers are maintained by regular visits by the field extension agents. It is difficult to determine what amount of a field agent's time is spent on actual extension work as opposed to input sales, credit collection, etc., nor to what extent being the credit agent damages farmer-agent relationships to the detriment of extension.

With research, the linkages are mixed. Attempts are constantly made to maintain contact with various institutions. In the case of horticulture the links with Centre de Formation et de Recyclage at Saïda are fairly good with trials of potato varieties, for example, from this center being performed.

A fair amount of liaison exists between INRAT and the school at Chott Mariam, Sousse regarding vegetable and fruit tree production. Tomato seed was provided by OSU to a tomato breeder at INRAT.

Liaison with Le Kef, and the Dryland Farming Systems Research subproject has been poor and results negligible (see Annex C - Part B). Similarly the Rangeland Improvement Subproject has not maintained adequate links with CTDA and the benefits to the area are not coordinated with other CTDA activities.

A little removed from research, but nonetheless important to the operations of the ESSU, is the question of soil analysis. With the ineffectiveness of the Le Kef laboratory in servicing CTDA needs, samples now are being sent to the CRDA laboratory at Kasserine, which is overworked and restricted to doing pH and calcium tests only, or to the INRAT laboratory in Tunis. Both these services are very slow and INRAT's lab is mainly designed for research.

CTDA performs a good many trials itself; a large part of these have been designed by visiting consultants. The capacity to enlarge the adaptive trial program will increase when the U.S. trained staff return and may cover CTDA's needs better than reliance on organizations outside the area.

The problem of soil analysis can probably best be resolved by upgrading the CRDA laboratory in Kasserine in order that it can service its own needs as well as those of CTDA.

1. Coordination of all the extension activities in the region is reported to be on the whole good. With CRDA there is a fairly close rapport with joint preparation of programs and coordinated meetings at CTDA subdivisions for their own staff, and at delegations for the délégués and the "omdah" from each "Imadat". Thus extension messages such as the need to spray fruit trees are being widely disseminated. Liaison with the Office d'Elevage et Pâturages is considered satisfactory with joint meetings taking place as well as exchanges of information on new techniques such

as the ammonification of straw. Trials of cereal varieties were facilitated by the provision of seed and information/suggestions by the Office of Cereals.

There is a recognition among many at the supervisory level of the agricultural authorities of the need for a unified extension service rather than a number of agencies, each providing some part of the service. However, given the present organizational arrangements the best that can be achieved is as close coordination and as professional a service as possible in order to service the urgent needs of the farmers who are now involved in high risk, high investment, high technology horticulture and arboriculture. The CTV system which is in the process of development is aimed at providing this coordinated extension service to farmers through out the country.

2. Development of new technology packages is being done largely as a result of trials and demonstration plots throughout the area, as well as at the "pilot" farm at Sbeitla. Many of the crops and techniques are new to the area and to some degree there is an element of "trial and error" about the system. As stated earlier a more structured program may be developed with the return of the US trained staff. It seems at present that the development of technical expertise based on local knowledge and local trials will serve the farmers better than more "scientific" research done in formal research centers, given the difficulty these organizations have in responding quickly.

The dissemination of new techniques is largely done through the training courses and demonstration days as discussed earlier. The current head of the ESSU intends to create slide/film series covering the season's actions for various crops. CTDA also has considerable audio-visual capability both in-house and in conjunction with DERV at Tunis. However until now much of the equipment which was bought originally has scarcely been used and the current technical assistants, together with the Tunisian members of staff are cataloguing and editing existing material.

The current technical advisors question the level of technology and its appropriateness to current needs. A memorandum was sent to the technical director on the future role of the communications department. At the time of the evaluation no response has been received. An urgent review of the role of the communications department, the appropriateness of the equipment and the staffing and training needs should be undertaken.

What appears to be lacking is a means of producing technical information sheets which can be used by the field extension agents as an "aide-mémoire". It would seem that a loose-leafed handbook should be prepared for the use of field-staff which they can update as new techniques are developed. It is fanciful to think that an extension agent, who is expected to have a wide range of

knowledge ranging from horticulture through arboriculture to dryland agriculture and animal production, can remember the details of his numerous training courses.

The upgrading of the existing agricultural service has taken place in terms of both quality and numbers, although numbers are difficult to compare strictly because of the changes in the area covered during the life of CTDA. The situation at the present time is:

Ingénieur principal	0.5
Ingénieur des Travaux d'Etat	2.0
Ingénieur adjoint	13.6
Adjoint technique	15.8
Agent technique	1.5
Ouvrier spécialisé	1.5

These figures include all the delegations now covered by CTDA and the fractions are accounted for by estimates of time spent on extension work by those whose responsibilities are divided.

The CRDA extension staff in the governorate of Kasserine numbers 31; OEP 3; the Office de Céréales has no field extension staff in the governorate, though it has grain handling facilities.

With the training which was discussed earlier the competence of this service has been markedly improved and those extension agents whom the evaluation team met displayed a considerable degree of enthusiasm. Criticism has been voiced about the lack of incentives and lack of mobility but the former is a problem in all government service organizations and the latter complaint appears to be less serious in Tunisia than in some areas of the world. Under the Extension subproject 20 cars were bought with the intention that there should be one per delegation. However, some were retained at headquarters and others have been involved in accidents so that the number now available in the field is not adequate. A further problem is that Chrysler cars, with which local mechanics are unfamiliar and for which spare parts are almost impossible to obtain in-country, are not the most suitable. Thirty mopeds were purchased some two years ago. These were not allocated to individuals and so the usual problems of lack of pride of ownership and consequent inadequate care resulted. Further in many cases, given the distances involved, mopeds are not entirely suitable for some purposes and areas.

3. Conclusions

The Rural Extension and Outreach subproject appears to have achieved a considerable part of its purpose. It still has a considerable task in front of it given that many farmers of the area have been persuaded to move into high risk activities which require considerable support over a long period. This support is considered to be a genuine role of government in most countries of

the world. The institution building process must continue in order to refine the service and justify the financial and human investment which has been made. The period which lies immediately ahead will be critical with the return of the Masters graduates who are going to have to create their specialized divisions and determine the role of the divisions in terms of extension, adaptive research and administration.

4. Recommendations

a. Continuity of progress in building the ESSU is vital and over the next year or two the newly qualified staff should have the continued input of the present expatriate staff. This should take the form of:

1) Extension of the present senior advisor. Current Tunisian staff have expressed the view that they value the expatriate technical advisors as neutral sounding boards for new ideas before presentation to the management. Assistance in programming future action is of paramount importance, and the present occupant of the advisor post should have an active role in this to help in settling-in the returning Masters graduates.

2) Continued assistance in the communications department. Yet again, it is recommended that the Tunisian designated as "storeman" but who has had long experience in this department should have some appropriate training and be given more responsibility. This department should urgently review its role, equipment, staff needs and training; it cannot continue to rely on technical assistance indefinitely.

3) The irrigation technical assistant should be extended for at least a month or two to help over the period of return of the other staff. His counterpart, who is judged very competent, should be nominated to lead the water management section of the ESSU. As he moves to the new position, he should be given short-term support on TDY basis by the present advisor, or by another OSU staff member who has prior experience in Tunisia and is familiar with the needs.

4) Consider, as appropriate, continued assistance by Peace Corps Volunteers whose past help has been well appreciated.

b. The first of the participants in the Masters training program in the United States will shortly return. It is suggested that by June/July a plan for the organization of the extension service be prepared with a scope of work for the different divisions (arboriculture, horticulture, dryland, livestock, water management, etc.). Detailed programs of work should be worked out. One essential element of the plan should be clear

definition of the relationship of CTDA extension activities with those of each of the other agencies involved in one way or another with extension.

c. A program of adaptive trials and demonstration plots should be prepared. The priorities and demonstration needs should be clearly spelled out and the inputs of the different ESSU divisions defined. Where appropriate, the social impact of proposed changes to the farming system should be considered, as should the economic implications. CTDA should not allow the "research" aspects of its work to become predominant. It would seem to have a role in research which would be closer to the needs of the farming community than might normally be the case with typical research organizations.

d. The West Central region of Tunis should quickly be provided with soil testing facilities which are responsive to the farming needs of the area. Kasserine has a laboratory which can do pH and calcium testing, but, as discussed above, is overburdened. This laboratory should be upgraded to serve the area.

e. Conspicuously, there is virtually no capacity in the ESSU at present for farm management, micro economic/farming and related data collection and analyses systems. The CTDA, in conjunction with CRDA, should have a unit which accumulates farm production, economics and farm management data, particularly on a whole-farm basis. This unit should be examining cropping patterns and opportunities within the framework of water availability, market opportunities, availability and cost of the factors of production and climatic constraints.

The Division de la Planification, du Suivi et de l'Evaluation also needs farm level data and the USAID/APMANE evaluation called for a financial farm planning capability; this problem of inadequate data should be remedied as soon as possible.

f. The CTDA extension service should divest itself of responsibilities of credit provision and loan collection as soon as possible. Its farm economics data can serve to assess loan feasibility but extension agents should not be credit agents.

g. The mobility of extension agents and the programming of their farm visits should be examined in order that this expensively acquired knowledge can be conveyed to the farmer and that the farmer can have access to data. Horticultural crops particularly will not wait when attention is needed.

h. Market intelligence appears not to be available to the farmer. Many farms are considerable distances from reasonable sized sources of demand and a small farmer cannot afford to spend large amounts of time or money undertaking abortive marketing journeys.

i. The needs for a water management division appear important and the recommendations of the current advisor should be examined by CTDA and USAID and the current counterpart be assisted as necessary.

B. LAND FARMING SYSTEMS RESEARCH 664-0312.2

The purpose of the subproject was stated to be 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 overall objective of the project was to develop a dryland farming system that would effectively use the limited climatic and soil resources of the project area, and introduce production increasing farm practices acceptable to local farmers. Moisture conservation techniques are used in similar dryland farming areas of the world and it was intended that adaptive research be conducted at the Ecole Supérieure d'Agriculture d'El Kef (ESAK) with an outreach program of field testing in the area of the Central Tunisia Rural Development Project (CTRD).

The Project Paper envisaged that the first year of the approved program would be needed for acquiring the necessary equipment, supplies and for initial personnel training. At the end of the second year, initial data from the carefully located field trials should have become available to serve as a guide for the next year's testing of more complete systems. By the end of the third year, information, trained personnel, improved seeds and other supplies, and financing should have been available for launching a widespread demonstration program in most of the sectors of the eight project delegations (there being eight delegations only in the original CTRD).

The 1983 evaluation report describes the start-up delays in the completion of the soils laboratory which had the chain reaction effect of delaying the selection and training of the technicians and delaying operations in support of the 1983 field programs. Similarly, the return of the advanced degree participant trainees, slated for the subproject, was delayed. Thus it was impossible for them to receive in-service training in cereals and dryland cropping from Dr. Floyd Bolton (an international authority in dryland cereal production and improvement) who was then ending his two-year term as Senior Resident Advisor to the project. Field programs were implemented using junior technicians, but the tillage and moisture conservation programs could not be implemented because of the lack of soil testing capability. Furthermore, the evaluation pointed out that once the new graduate degree holders returned to post, they would need time and guidance to translate their academic studies into effective applied research efforts, as little of their thesis research training was relevant to the research needs of Central Tunisia.

Despite these problems, during the 1981-82 cropping season eight sites were chosen and dryland cropping trials established. Included in these were cereal breeding and variety trials; weed

control tests using various herbicides; fertility trials using various rates of nitrogen and phosphorous application; and seeding rate and row spacing trials. All of these tests were conducted on barley, durum wheat and bread wheat. In 1983-84, the same trials were being repeated with, in addition, trials on broad beans, chickpeas, oat and vetch forage production and forage trials testing annual ryegrass and various selections of berseem clover and annual medic.

However, the inability, already alluded to, of the soils laboratory to respond to the need for development of response curves for soil fertility and moisture was a handicap. Similarly, the lack of baseline data on current farm practices needed to tailor recommendations to farmer's capacity to adopt them -- as well as the enforced omission from the program of soil management, tillage, moisture conservation and crop rotation (because of the lack of soil tests) -- prevented the formulation of transferable packages, and was reported to have placed an undue burden on the Resident Advisor.

The Rural Extension education subproject was reported by the 1983 evaluation team to have incorporated some of the more promising applied research results into farmer demonstrations (there appears to be no clear evidence of this) but the initial aim of developing farming system packages and testing and proving them technically, economically and socially had not been achieved. This could hardly have been expected within the time, even had all the components been in place as originally envisaged in the subproject design.

The evaluation team also pointed out that, given the predominance of livestock in the area, the plant material testing and seeding methods for range forages being undertaken by the AID-supported Livestock and Range Management Project should be utilized as rapidly as possible to test an improved crop/livestock farming system.

They also commented on the fact that closer geographic proximity of the research subproject and the extension specialists of the Rural Extension and Outreach subproject would have facilitated program planning and coordinated implementation of dryland farming activities. The evaluation report also pointed out that the Institut National de la Recherche Agronomique de Tunisie (INRAT) was developing a new experiment station for dryland agricultural research adjacent to the site of ESAK, and that the graduate thesis studies of the Institut National Agronomique (INAT) had the potential of providing direct support. In the recommendations it was proposed that not only should there be increased coordination between the subproject staffs of the Research and of the Extension subprojects, but that there should be a coordinating committee for research and related activities. However in the final report of the

Office

of

International Agriculture of Oregon State University, (OSU) (1985) in the discussion on inter-agency cooperation, there is further criticism of the communication and cooperation among OSU, USAID and the Government of Tunisia representatives. The report goes on to say, "the lack of a true commitment to interact was a constraint. There is a great need for increased coordination among decision making bodies and for carefully coordinated policy thrusts within government. Rivalries among agencies hindered the progress of the project."

Discussions within the CTDA confirm that the level of cooperation between CTDA and Le Kef remains poor. For example, the results of trials conducted in 1983-84 and 1984-85 have still not been communicated to CTDA despite written requests, and CTDA personnel indicated they not did not yet know formally (in March 1986) if trials were being conducted for the current 1985-86 season.

Discussions at Le Kef suggest that each side blames the other regarding coordination and cooperation. Le Kef claims that it is handicapped because the vehicles with which it has been supplied are unsuitable. For soil samples it is claimed that they await PL 480 assistance to upgrade the research laboratory funded under the project to a farmer-oriented one which can undertake large scale testing rapidly. There has been some limited contact between Le Kef and the Rangeland Development Project when staff from the latter demonstrated ammoniated straw techniques, but on rangeland plant testing (both indigenous and exotic) there has been none.

One positive output which is reported is the identification of two barley cultivars which are more drought resistant than those in common use. However, the process of release, multiplication and dissemination of these varieties appears to be rather slow.

CTDA expresses the view that a program of soils testing should be prepared in order to arrive at valid recommendations for Central Tunisia which are both effective and economically sound, but past performance seems to suggest that the will to cooperate on this matter is as weak now as in the past. (The soils analysis laboratory at Le Kef is currently supposed to be carrying out tests, but there is little evidence that this is benefiting the CTRD area.)

The economic benefits from the project were predicted to become more apparent in the second five-year period than during the life of the subproject itself. Potential increases in yield of as much as 400% (from 2 Qx/ha. to 8 Qx/ha., or on well-managed farms even more spectacular results) were suggested. A rise of 100% was assumed in justification of the subproject. This implied a rise in production from the 1977 figure of 110,000 Qx to 220,000 Qx. For wheat the production increases were expected to be of the same order. However results of this magnitude seem overly optimistic.

1. Conclusion

The results from this subproject appear to have been very limited even allowing for the start-up delays and the long time frame within which most research takes place.

Soils testing capacity appears to be the service most needed by the agricultural services and farmers of the CTDA area. There is a soils testing laboratory in Kasserine which would probably be suitable for upgrading and geographically more appropriate than that in Le Kef.

C. SMALL HOLDER IRRIGATION DEVELOPMENT SUBPROJECT 664-0312.3

The purpose of the subproject was stated to be optimization of small farmer access to and income derived from agricultural groundwater in the CTRD zone primarily through on-farm irrigation infrastructure expansion and secondarily through the diffusion and institutionalization of appropriate on-farm water management practices. The subproject was to involve a combination of capital and technical inputs with US resources concentrated in those interventions where USAID was convinced that the maximum small farmer impact and best economic returns lay. Thus the major AID financing was destined for shallow well improvement and development, natural spring development and surface infrastructure for four unused deep wells. GOT inputs were to be concentrated in the larger scale public irrigation perimeters (PPIs) where considerable capital and organizational resources had already been invested.

An AID loan of \$4.4 million was to be used to finance the selected irrigation facilities and a \$400,000 grant to finance water management improvement to reduce wastage and improve field efficiency of use.

1. Physical Inputs

Improvement of shallow wells was proposed for some 300 wells by deepening them to about 3 meters below the ground water table; lining to ground level; and installing either electric or diesel pump sets if needed. Installation of 200 new shallow wells was proposed with the farmer undertaking the excavation of the well and AID-funded credit financing the farmer to hire local entrepreneurs to execute work related to well deepening and lining and to purchase pumps, etc.

By the time of the 1983 evaluation, 17 new wells had been constructed and 323 wells had been, or were in course of being, improved. To date, the number of wells which have been improved or installed is 1331.

Following the 1983 evaluation recommendation a two-year water use program for the PPIs was prepared by an OSU consultant in conjunction with the extension advisor and the present irrigation advisor. This has raised the efficiency of water use, and the irrigation advisor and his counterpart are doing an evaluation with a view to preparing the succeeding program.

A further recommendation was that liaison with other services should be improved. This appears to be better than was formerly the case, although the view was expressed that inter-agency jealousy prevents close relationships in some cases.

Examples of improved cooperation are with the Centre de Recherche de Génie Rural with whom joint seminars have been held on water conservation methods. Joint research has been conducted with the Direction des Ressources en Eau (DRE).

The irrigation advisor and his counterpart have had discussions with the Office de Mise en Valeur de la Vallée de la Medjerda (OMVVM), which has a water-use extension arm, and the two organizations are providing mutual assistance. There seemed to be a lack of interest in water scheduling on the part of OMVVM and there is some doubt at CTDA if they can benefit greatly from this association. However, contact should clearly be maintained. Similarly, the contacts with the Office de Mise en Valeur à Gabès have been useful in developing the use of small machinery.

Training of extension agents has been undertaken in conjunction with the Centre de Formation Professionnelle Agricole (CFPA) at Saïda. There have also been training courses at OSU on irrigation and water management.

In the field of irrigation perimeter management, considerable efforts are being made to create associations for self-management of the perimeters in order to reduce state involvement (AICs). Similarly, a policy is being pursued of raising the price of water with the aim of covering the real cost. Currently the cost of water to the farmer is about 38% of the variable costs and 23% of the total cost. The Conseil d'Administration, which includes representatives of the National Farmers' Union (UNAT) as well as of the political authorities, examines the CTDA recommendations for price increases, but tends to resist abrupt changes. At the meeting which took place during this evaluation, the committee voted an additional price increase of two millimes per m³. It is considered that it will take a long time to arrive at unsubsidized pricing. Such a policy would, however, encourage an interest in better water management and would assist in the task of husbanding this scarce resource.

The economics of irrigated agriculture are examined in detail in Chapter 4. Economic and Social Impacts, as are the credit aspects of the program.

ANNEX D

ASSESSMENT OF THE SOCIO-ECONOMIC IMPACT OF THE CENTRAL TUNISIA DEVELOPMENT AUTHORITY ON THE BENEFICIARY POPULATION

A DISCUSSION OF ISSUES

The following discussion deals with specific issues and recommendations involved in an assessment of the socio-economic impact of the CTDA on the beneficiary population. These issues include health, social concerns, agriculture, beneficiary participation, and the need for socio-economic data. The discussion is based on field observations, discussions with regional and local officials and a perusal of relevant documents.

A. HEALTH

CTDA's involvement in health matters includes facilitating the construction phase of rural health centers including extensions, equipment and renovations in some, with maintenance and personnel the responsibility of the Ministry of Public Health. Since 1980 there has been an increase of about 20% in the number of health facilities in the region. In practical terms this increase has provided better coverage of the dispersed rural population. At a three year old health facility visited, it was reported that people currently using the facility had previously been limited to scattered first aid stations in the countryside or, in cases of serious illness, been forced to travel to the governorate seat for medical treatment. Now they come to the health center in the delegation, particularly on market day when an average of a hundred patients may be seen. Nevertheless, some centers are not yet equipped and the personnel not yet recruited. Currently, there is a delay of about a year between the completion of construction and the opening of the facility for use by the population.

The provision of potable water with its potential impact on the health of the beneficiary population, as well as the possible economic benefit resulting from time saved in procuring water being allocated to income-producing activities, is another area of interface between CTDA and health. Hopkins' (1983) sample of water points in Central Tunisia found that 62% of preschoolers had diarrhea the preceding week and 30% had a skin infection. Although Isely (1983) found a clear drop in the incidence of diarrhea and skin infections among young children using an improved as compared to an unimproved spring water source in the northern delegations covered by CTDA, he also found that women using either type of source have little overall perception of these changes. His data however are not correlated additionally with distance from the source, which he feels may be a

determining factor in delineating the total quantity of water procured by a household. Informal questioning of women both on farms and at a family planning clinic turned up little current incidence of diarrhea among their offspring. However these conversations took place in March when clean water is more plentiful and diarrhea prevalence generally lower.

Two improved water points visited during this evaluation illustrated two unplanned situations: first both points were only open half a day and were thus very clean but unused in the afternoons and secondly, at one point the dispersed population used another source at a distance of 4km in the afternoon rather than a second improved source in a hamlet only about 1 1/2 km away, since the inhabitants living around the latter refused to allow them access. This intergroup animosity persisted even though the water was reportedly turned off in the dispersed population zone in order to maintain constant pressure for the denser population of the hamlet. Hence, improving the water source may in this case have served to maintain or exacerbate already-existing social tensions in the area.

Improved nutrition is another area indicating health and quality of life status in the area. Availability of higher quality and greater variety of food stuffs in the marketplace is evident compared with ten years ago. Moreover, among those families visited for this evaluation who have benefited directly from the agricultural interventions, the frequency of meat consumption has gone up and the variety of fruits and vegetables available has increased. However, in a group of rural and village women interviewed briefly at a family planning clinic in Foussana (and not specifically tied in with any CTDA projects) concerning their meal the previous weekday evening, no appreciable difference could be noted between their menus and those served by women seen at a local PMI in Kasserine prior to the establishment of CTDA as noted in Ayad (1978). The main determining factor in the serving of a balanced meal in the 1986 group seemed to be rural or town residence, with the rural women having the poorest choice of food.

Family planning behavior, though discussed as a health issue here, might properly be described as a social issue or an economic one when the farm as a household production unit is considered. McPherson (1985) notes that only 19% of women in Kasserine governorate are continuous users of family planning compared to the national average of 41%, though 90% of all MWRA, including the local group, have knowledge of at least one method. Family planning educators working in a mobile family planning unit feel that women are more receptive now than ten years ago (one of the educators has been working in family planning in Kasserine for 18 years), in that they now have greater knowledge of methods and may come voluntarily to ask for family planning services. Previously, the educators had to go

door to door to get women to visit the mobile unit. Women visiting the mobile unit on the day visited were there with problems: either with conditions they perceive to be related to their IUDs or with probable pregnancies in search of belated family planning interventions.

In comparing results of the Tunisian Fertility Survey of 1978 and the Tunisian Contraceptive Prevalence Survey of 1983, Ayad and Zoughlami (1985) found that the percentage of non single women who had practiced at least one method of birth control in the central region of Tunisia (including Kasserine, Sidi Bou Zid and Kairouan governorates) had increased from 18% to 33% in that five year period. However, these figures were well below any of the other regional divisions in the two studies or the national average of 45% for 1978 and 60% in 1983. Similarly percentages of married women for the central region who were using a contraceptive method at the time of the surveys were: 10.9% in 1978 and 17.7% in 1983, or lower than any of the other regions and show a smaller percentage increase than the national average of 31.4% for 1978 and 41.1% in 1983. In 1983, married women in the central region gave as their principal reasons for not practicing contraception the desire to have children, fear of secondary effects, current pregnancy (all nearly the same as the national average) and husband's opposition (at 9.1% this percentage is higher than any other region and than the national average of 4.6%). Finally, when asked about methods to be used in the future, a majority (54.3%) of married women in the central region using no contraception at the time of the 1983 survey said they did not wish to use it in the future, compared to the national average of only 34.8%. Thus, the region remains less favorably disposed to contraception than the rest of the country.

The Regional representative of the Ministry of Public Health in Kasserine would like to see an increase in cooperative activity between the Ministry and the CTDA and to this end suggests that the CTDA have a health liaison with whom joint activities can be planned. Some of the locations for health centers were poorly planned since the choices seem to have been largely politically motivated; this has left some of the dispersed populations as much as 50km from the nearest center while others have more than one health center available at a 5km distance. A pilot project still in the data gathering and planning stage at the health center in Bou Zgueb is combining health center work and home visits with the goal of helping the local population develop a health program which responds to their needs. If this project is successful it will be proposed at the regional level with hopes of collaborating with the CTDA. Concerning health education, the Regional Health representative mentioned that CTDA and MOPH currently interface only at the level of the Water User Associations (WUA) being set up at potable water points. He feels the WUA concept and CTDA-MOPH cooperation might

usefully be extended to future sanitation programs in urban areas which are needed in the region to deal with solid waste (insufficient personnel, need for one garbage truck per delegation) and waste water management (need for sewer systems). Finally CTDA could get involved in some of the health concerns in the market places such as helping conduct studies, arranging for credit to butchers for the purchase of refrigeration and addressing general sanitation concerns of the market area.

Bearing in mind the above discussion of health issues and health as a quality of life indicator of program impact, it is recommended that the CTDA continue to facilitate health-related interventions as part of its focus.

B. SOCIAL CONCERNS

Among the goals of the agricultural interventions introduced by the CTDA are the social benefits to be accrued from an increase in income and expressed as a general improvement in the quality of life. Field visits to direct project beneficiaries indicate that, indeed, the standard of living for those immediately touched by the irrigation intervention--whether shallow wells or irrigated perimeters--has changed dramatically. These families have used their new income first to build permanent housing where previously they had lived in mud shelters and then to acquire various "luxury" items such as televisions, cassette tape players and refrigerators. Children were adequately clothed (although were very dirty) on these particular farms; drives through the countryside indicated much the same clothing as a decade ago for children not clearly touched by the interventions. Passing through small villages in Central Tunisia one is struck by the new growth which has taken place in the past decade and particularly by the new housing which is still going up, indicating a general, across-the-board improvement in housing conditions whether specifically related to the CTDA or not.

A social profile of the Kasserine region based on the evolution in population and housing presented in the results of the 1984 Census for Kasserine Governorate and in McPherson (1985) indicates the following:

1. From 1975 to 1984 the population growth rate has increased 2.5% per year for Kasserine as a whole, with the urban growth rate at 8.9% and the rural rate at 1.2%. By 1984 the urban population was 30% of the total.

2. From 1976 to 1981 the external migration rate was 1.51%, less than the national average, and internal migration toward the coastal cities was also low, with 3.9% for Kasserine from 1970-75 compared to the national rate of 4.2%

and 3.4% for Kasserine from 1975-80 compared to 3.3% for the nation as a whole. Intra-governorate migration from 1975-84 indicates that all delegations except Kasserine Nord and Sbeitla, which were already mostly urban, had lost rural population to urban centers.

3. Housing has shown only small overall increases from 48,857 in 1975 to 52,464 in 1984 or a rate of 0.8% per annum. However, housing quality has improved with substandard housing (gourbi, tents, etc.) being reduced from 28.4% of the total in 1975 to 13.5% in 1984. At the same time villas and apartments increased from 4.7% in 1975 to 7.5% in 1984. One might conclude that the substandard housing is steadily being torn down and replaced by more adequate quarters, hence the prevalence of new housing which is visible even though the overall housing growth rate remains small.

4. Although the governorate as a whole averages 2 rooms per household, 55% of rural homes have only one room. A comparison of waste water evacuation between rural and urban indicates that while 21.4% of urban homes are branched to a sewage system and 41.1% have a dry well, 37.5% still dump waste water outside. In rural areas those dumping waste water outdoors remains at a high 91.4%.

5. For the governorate as a whole, 87.3% are home owners. This is broken down into 71.9% for urban dwellers in 1984 compared to 64% in 1975 and 93.8% for rural in 1984, compared to 92.5% in 1975.

6. Households with electricity have increased in urban areas from 46.8% in 1975 to 78.8% in 1984. Those with electricity in rural areas have increased from 0.8% in 1975 to 9.8% in 1984.

7. One quarter of the population is branched to the SONEDE system (1984) with 76.3% of urban households and 3.7% of rural ones. Of those not branched to SONEDE, 18.9% use private wells or majel, 31.8% use communal wells and 24.1% use springs or rivers.

8. Although a large majority of urban homes now have ovens and toilets, only 10.5% have a shower or bath. In rural areas, these amenities hover just about the 11% mark except for shower or bath with a low 0.5%. Bottled gas is used for cooking by 38.1% of homes, 26.2% use kerosene burners and 32.7% continue to use wood as a source of cooking fuel; 26.9% of Kasserine households have a television and 10.1% refrigerators as of 1984.

9. Illiteracy in Kasserine is high, with 45.6% of men and 75.7% of women declared not literate in Arabic or French. This can be compared to the rate for Tunisia as a whole of 34.6% of men and 58.1% of women.

10. The large average family size of 5.6% in Kasserine can be compared to 4.7 for the national average with children ever born reaching 5.36% in Kasserine against 4.6% for Tunisia as a whole.

11. About half of the households in Kasserine are involved in sedentarized agriculture with a combination of dryland agriculture plus livestock; others also have 2600 private surface wells or are farming small irrigated perimeters. Of those in agriculture, 41.1% have less than 5 hectares, 25.3% have from 5-10 hectares and 30+% own larger tracts.

The social problems inherent in new urban growth abound, and were discussed at some length with the regional head of social action programs for Kasserine governorate as well as with three social workers. The principal ones cited include rural exodus, juvenile delinquency, alcoholism, clandestine prostitution, unemployment, emigration abroad and divorce. All are of course interrelated, and caused by the first whose pace--at least within Kasserine governorate--is outstripping efforts aimed at stemming the rural to urban migration trend by creating a rural existence which is attractive to those concerned. A rural exodus is occurring not only to Kasserine City but also at the level of the delegation towns. The breakdown in social solidarity in slum areas has caused the dislocation of family life, a serious problem of abandoned women and children, and the need for these women to find respectable employment. There has been a lack of respect for the rural life style and system of social control these in-migrants left behind. Among the social effects resulting from CTDA agricultural activities, there has been a renewed interest among those who cannot make it in the towns in returning to their ancestral areas where they perceive that the government is interested in helping them.

The Social Affairs regional office would like to see greater cooperation between the CTDA, MOPH and itself than has been the case to date. They would like to see a social action component added to agricultural programs to broaden the potential social impact of these interventions. The regional representative feels that the "Famille Productive" project in El Ayoun, and the combination PMI-nursing school in Jedliane are examples of fruitful collaboration across ministerial lines. He believes that economic development projects per se cannot stand alone but must include social education in order to obtain the greatest social benefit. Moreover, the mass media are felt to have an important potential role to play in increasing the dignity of rural family life.

It is recommended that social issues like the health matters discussed above be integrated into future CTDA activities, with a specific position created in the institutional organization chart of the CTDA to accommodate these expanded concerns and ensure adequate coordination between the two line agencies involved in social affairs and future CTDA programs.

C. AGRICULTURE

The successful implementation of CTDA agricultural interventions has had a social impact on women who do much of the field work as unsalaried laborers on the family farm. Although an in-depth analysis of these impacts on women's lives in Kasserine was beyond the scope of the current evaluation, the social impact on women in a similar project on irrigated perimeters in Sidi Bou Zid has been analyzed by Ferchiou (1985). Her findings may very likely be relevant to a clearer understanding of the social impact in the CTDA interventions. Ferchiou found that the shift from a subsistence economy to one based on irrigated perimeters had increased the work burden on women and lowered the age at which young girls began working in the fields on a regular basis. Since increased production for the market economy is the principal goal of the irrigated perimeter farm and female family members work as unsalaried laborers, the head of the family mobilizes the labor force available as soon as family members become viable workers. Female workers do not control how that revenue is to be used.

The most immediate effects on women's social development found by Ferchiou was the reduced school enrollment of girls at the primary level where not only was an early drop out rate noted, but a growing lack of female enrollment at all has been observed since the implementation of the Sidi Bou Zid irrigated perimeters, as the potential female school population is siphoned off into unsalaried agricultural labor. The implication for a pro-natalist viewpoint among the local population should be examined. These issues and attitudes need to be carefully studied within the zone covered by current and future CTDA agricultural interventions.

By comparison, Salem-Murdock found, in a study of household dynamics on mostly irrigated farms, that as farm units grow larger, employment outside the home on agricultural tasks drops substantially both for adult women and for girls 6-14 years of age, changed very little for adult males, and increased slightly for boys in the 6-14 age group (See Table 1)*.

*/ Ferchiou's findings in Sidi Bou Zid may stem from investments of time required in start-up of irrigated farming. Initially, demands on all family members may increase when irrigated farming begins, related to planting of trees, etc. and may decline somewhat after irrigated agriculture is established, as Salem-Murdock's findings suggest.

Table 1

INTRA-HOUSEHOLD LABOR ALLOCATION BY SOCIAL STRATA
 BY:
 ADULT MALE, ADULT FEMALE, BOYS, AND GIRLS
 IN HOURS PER 14 HOUR SUMMER DAY AMONG 15 HOUSEHOLDS.

SIZE OF HOLDING:	SMALL HOLDERS				MEDIUM HOLDERS				LARGE HOLDERS			
	0-3.9 HA (60%) N=9				4-7.9 HA (20%) N=3				8 HA OR MORE (20%) N=3			
ACTIVITY:	ADULT MALES OVER 15	ADULT FEMALES OVER 15	BOYS 6-14	GIRLS 6-14	ADULT MALES OVER 15	ADULT FEMALES OVER 15	BOYS 6-14	GIRLS 6-14	ADULT MALES OVER 15	ADULT FEMALES OVER 15	BOYS 6-14	GIRLS 6-14
	COOKING	0	1.8	0	0.8	0	1.9	0	0.8	0	2.1	0
COLLECTING FIREWOOD	0	1.2	0.4	0.9	0	0.9	0.5	0.8	0	0.5	0.4	0.
CLEANING	0	2.7	0	2.1	0	2.9	0	2.4	0	3.1	0	1.
WASHING CLOTHES	0	1.3	0	0.9	0	1.4	0	0.9	0	1.7	0	0.
CHILD CARE	0	3.7	0.2	1.1	0	3.5	0.2	1.2	0	3.9	0.5	0.
ANIMAL CARE	0	0.4	2.1	3.1	0	0.2	1.4	2.5	0	0.1	1.7	2.
ARTISAN PROD.	0	0.3	0.2	0.3	0	0.5	0.2	0.2	0	0.5	0	0.
SUBTOTAL INSIDE	0	11.4	2.9	9.2	0	11.3	2.3	8.8	0	11.9	2.6	7.
DRAWING WATER	0	0.2	1.2	1.1	0	0.1	1.3	1.3	0	0.1	1.2	1.
TILLING UNDER TREES	0.9	1.2	1.1	1.7	1.6	0.8	1.6	0.9	1.9	0.5	1.6	1.
PLANTING	0.3	0.1	0.2	0.1	0.4	0	0.2	0	0.6	0	0.2	
WATERING	3.1	0.6	1.8	1.7	3.4	0	2.3	1.1	3.8	0	2.3	1.
WEEDING	1.1	1.2	1.1	0.9	1	0.8	1.2	0.9	1	0.6	1.2	0.
HARVESTING	0.5	0.2	0.3	0.2	0.5	0.2	0.3	0.2	0.4	0.3	0.4	0.
FERTILIZING	0.1	0	0	0	0.1	0	0	0	0.2	0	0	
MARKETING	0.1	0	0.2	0	0.3	0	0.2	0	0.3	0	0.3	
WAGE LABOR	2.9	0	0.3	0	1.5	0	0.3	0	0.9	0	0.1	
SUB-TOTAL OUTSIDE	9	3.5	6.2	5.7	8.8	1.9	7.4	4.4	9.1	1.5	7.3	
TOTAL	9	14.9	9.1	14.9	8.8	13.2	9.7	13.2	9.1	13.4	9.9	12.

SOURCE: MUNEERA SALEM-MURDOCK, HOUSEHOLD DYNAMICS AND THE ORGANIZATION OF PRODUCTION IN CENTRAL TUNISIA, IDA, BINGHAMTON, NEW YORK, NOVEMBER 1985.

On the farms visited for this evaluation girls not in school were involved in agricultural labor along with their mothers. Boys were reportedly in school, but help on the farm during summer vacation. In one family of 7 girls and 2 boys, only one girl was still in primary school. The two oldest girls never went to school at all. The next three quit primary school because so few other girls were attending that they were embarrassed (heshmana) to be surrounded by so many boys and to travel the distance they had to walk to get to school. The sixth girl was still doing well in fifth grade with plans to go on to the lycée but her younger sister had failed third grade and been pulled out. The two little boys were still preschoolers, with their parents planning to send them to school when the time comes. The CTDA extension agent indicated, as did the women, that the older girls had become "virtual technicians" since they did all the greenhouse and perimeter work.

Yet another social issue surrounding the agricultural interventions is the efficacy of agricultural extension. Since so many of the agricultural workers are women, it would be advantageous from a production standpoint to involve women directly in the dissemination of knowledge concerning techniques and strategies so that they will not always be receiving information second hand, and can be brought into the decision-making process of the farm enterprise. One approach that should be emphasized taking into account cultural constraints is to involve more women agricultural extension workers. Where women are not permitted to leave the farm to attend demonstrations far away, field days could be arranged locally. Women social workers do home visits and possibly these animatrices could be given additional agricultural training so that they could combine the purposes of their visits to include both social and agricultural education. A similar pilot program could be started with Family Planning mobile teams. It was quickly recognized by the regional head of Social Affairs in Kasserine, a former social worker himself, that his work in the field was often inhibited by his gender and that when accompanied by a female animatrice his acceptability to the population, and consequent effectiveness, was greatly enhanced. In addition to the gender of the extension worker, it is imperative that the rapport between extension workers and farm laborers be considered with sensitivity, and not as one party being knowledgeable and hence higher in status, and the other an ignorant practitioner of "inferior" traditional methods awaiting the imposition of "correct" ideas.

The option of individual shallow well development versus publicly managed irrigated perimeters may imply certain psychological consequences which have an impact on productivity (apart from the purely technical advantages of precise control over water). The sense of pride and of control of the production process is increased for shallow well owners who control the water supply themselves. Less water is probably wasted than on the public irrigated perimeters where central water management prevails. Possibly greater grass-roots individual and group control of water allocation

in the public irrigated perimeters could reduce the presently perceptible differences in production potential of the two modes of irrigation. The development of Irrigation Committees for the PPIs in the CTDA area is foreseen and was approved at a recent CTDA administrative council meeting.

Concerning agricultural interventions it is recommended that (1) studies be undertaken to assess in-depth the social impact of these projects on women and on female education in particular, (2) female agricultural agents be recruited by CTDA to work with female farm laborers and (3) shallow wells be given priority over irrigated perimeter development, or other cooperative mechanisms be instituted in the perimeters to increase the control farmers have over when and how much water their crops will receive.

D. BENEFICIARY PARTICIPATION -- WUAs

How has the beneficiary population been involved in project planning and implementation? It appears from discussions with local officials that the concept of water user associations (WUAs) aimed at increasing beneficiary participation and financial responsibility in the maintenance of water points is an AID-sponsored idea which has begun to be implemented in the CTDA project area. The proposed tiered organization at several levels of the local and regional administrative structure is geared toward gathering support vertically down through the administrative layers as well as horizontally mobilizing the inputs from various representatives of line ministries involved in the potable water provision. WUAs are an essential part of the Potable Water Institutions Project. The initial steps have already been taken--100 WUAs have been formed, and some of them are becoming functional. These appear to be more successful so far in some of the Kasserine delegations and considerably less well received in the CTDA delegations located in Siliana governorate. This is partly due to the fact that many of the Siliana water points are springs or equipped with manual pumps and, therefore, their maintenance is not a need felt by the population--the water will continue to run whether they contribute or not. In addition, the Health infrastructure in Siliana has not been supportive of the program and in fact appeared rather hostile towards CTDA activities in the more southern delegations of their governorate.

Some of the problems encountered in the establishment of the WUAs have included the following:

- o Resistance to the formation of WUAs. When this was encountered, the consultant in charge of organizing them was able to get support from the governor to stop the supply of free fuel. Once the pumps ceased to function the need to organize in order to buy fuel prevailed and the WUAs were formed. Resistance is due to the historical availability of free water and to the fact that water points have been part of the public

domain and therefore have not fallen within the area of private responsibility.

- o There is animosity between different family groups in choosing the pump guard and in the use of water.
- o Some water points have several pipelines coming out and extending for varying distances. Those drawing water from the end have lower pressure, and those in the middle of the pipeline have to walk further to get water than some of those at the end, causing friction about where the pipeline will stop.
- o Uncertainties as to the legal status of the WUAs led to resistance in some areas. Although this situation is acceptable in Kasserine (the governor is supportive) it is blocking the WUAs in Gafsa Nord and Sened where the *délégués* do not want to proceed pending resolution of this issue. Once they have a legal conformation, the local WUAs will eventually have control over their own budget and projects without fear that the money will go to other funds or purposes. Initially, however, funds will be maintained by delegation-level committees.

At a visit to a water point with a WUA which has been functioning for about six months, some of the issues facing the WUA were raised. This water point receives its water from the capping of an old Roman spring and a well drilled nearby which had been used for irrigation for many years. The people already had a long history of maintaining their water point and are a homogeneous group of 43 related households (one tribal group) using the point in winter within a 4 km radius requiring a 2 hour round trip from the outer fringes. In summer, the users swell to 300 households including some transhumant herders moving through the area. The nucleus of the WUA is formed from local hamlet officials including those from the health room, school, the *omdah*, the Destourian party official and other respected elders in the winter population. They formed their own water user fee policy of charges based on what the water was to be used for (home consumption, size of herds, etc.) with leeway for those who are unable to pay. Currently families are paying 1.500-2.000TD per month for home consumption which is perceived as affordable but they do not feel they can add more should deepening of the well be needed. Their collection receipts and costs are carefully recorded and cover the price of pump fuel, oil and small repairs but do not always cover the work of the pump guardian who may need to pump for ten hours per night in summer (two hours daily in winter) to ensure an adequate supply. The villagers noted with some pride that the school teacher had brought the children over to clean up the water point.

Future improvements to WUAs were suggested by the consultant in charge of their organization and include:

- o A WUA office to be constructed next to the water point itself;
- o Expansion of the role of WUAs to include various development projects emanating from the felt needs of the population;
- o A local delegate selected by the WUA who would act as liaison between the local association and the delegation and governorate administrative levels and
- o The formation of maintenance brigades in each delegation who would be on call to respond rapidly to technical problems. Finally, it was noted that it may be easier to form a WUA before a water point is created so that a working organization can take over responsibility for hygiene and maintenance as soon as the point is functioning.

E. NEED FOR INSTITUTIONALIZATION OF SOCIO-ECONOMIC DATA COLLECTION

In assessing the socio-economic impact of the CTDA on the beneficiary population of Central Tunisia, the need for in-depth baseline statistical data as well as comparable data to be collected at regular intervals for planning, monitoring and evaluation is evident. The production of health statistics in particular appears to have slowed down considerably compared to those available ten years ago at the national level. Attempts to locate regional morbidity data in Kasserine governorate proved futile as did later attempts to procure the same from the Health Office at USAID/Tunis. Evidently, regular preparation of statistical reports by the Ministry of Public Health has all but ceased with the personnel reportedly overwhelmed with piles of data yet to be processed. Hence, a comparative analysis of morbidity data for Kasserine governorate over the past ten years could not be undertaken. Other data recently collected by the CTDA and still being processed were not yet available for use in impact assessment.

Although governorate and delegation-level data are available from the 1984 Census population and housing conditions and will soon be available on consumption patterns, changes in the administrative boundaries of governorates and delegations and of the area covered by CTDA itself make any ten-year comparison of the beneficiary population problematic.

It is recommended that a base sample population of households in the CTDA zone be selected which would then be followed at regular intervals throughout the life of the project. (This presents the problem of the Hawthorne effect, however.) Some of these households could become a subsample for more in-depth analyses of particular issues. Should CTDA's area of mandate be expanded to include two or three entire governorates (or conversely reduced to

a single governorate) comparative statistics at least at the governorate level would be more readily available to assess the future socio-economic impact of a redefined CTDA project area.

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ANNEX E

INSTITUTIONAL ANALYSIS

INTRODUCTION

This annex is designed to provide additional background on a number of the issues concerned with institutional and organizational effectiveness discussed in the main text of the report, particularly in Chapters III and IV. Rather than discussing each issue in more depth, we have selected several issues that merit greater attention than treatment in the main text could allow. Technical assistance and training will be reviewed first in this section. Subsequently, an analysis of the questionnaire results pertaining to CTDA's organization is included, followed by an analysis of key aspects of USAID/CTDA relationships.

A. TECHNICAL ASSISTANCE

Since 1979/80, a considerable amount of technical assistance (TA) has been provided to various units of the CTDA -- and to other GOT agencies -- under the CTRD Project. A good deal of this TA has been provided by expatriate experts, primarily from U.S. universities, including Cornell, Wisconsin, and Oregon State University. At present, long-term TA is being provided under a pre-existing cooperative agreement between AID/Washington and a consortium composed of Clark University and the Institute for Development Anthropology (IDA).

In addition, for the past three years, there has been provision for long-term resident Tunisian TA, funded under the Area Development subproject. This TA has been in the area of planning, and has been provided by two different experts. The present expert, made available on a release-time basis from the Ministry of Plan, has several more months of assistance to provide under his present contract.

Short-term TA has also been provided, and will continue to be provided, to the CTDA under a variety of subprojects and contractual arrangements, including by Tunisian consulting firms.

1. Area Development Subproject

After the CTRD evaluation of 1981, USAID/Tunis provided the services of Dr. Richard Roberts, Jr. to identify assistance and training needs of the CTDA in the areas of organization and management. As the Tunisian AID project manager noted in discussions, Dr. Roberts and the TA specialists subsequently provided "were very cordially received by the then-PDG of the CTDA, whereas the former long-term institutional TA had been

regarded essentially as inappropriate for CTDA needs; the 1981 evaluators were perceived as being antagonistic from the outset."

The types of short-term TA and related on the job training called for included:

- o Project monitoring and management training, emphasizing the design of action or implementation plans (tableau de bord) for each project or program element.
- o The next recommendation was short-term TA for evaluation of project proposals, training or retraining of staff in project planning, including developing team work between CTDA staff and staff of other organizations intervening in the region, to produce a stock of "bankable" projects.
- o Through role playing and various other approaches to training, TA was to be provided to enhance the CTDA's analytic and project management capability. Various other organizations' staffs were to be integrated into these proposed seminars.
- o Assistance was also proposed for the DAAF in pursuing its objective of developing a coherent administrative system which would facilitate implementation activities while at the same time providing for effective financial monitoring and for internal audits.
- o TA for purchase of the necessary software for micro-computer utilization was also recommended, to facilitate the development of a data bank.
- o TA was suggested to assist the CTDA in revising its organization chart so as to separate programming responsibilities and those for studies and information generation from responsibilities for preparation, implementation or monitoring of non-agricultural projects.
- o This was to be followed by the preparation and implementation of an internal information management system.
- o In addition, serious consideration was recommended of modifications in the personnel policy of the CTDA so as to attract and maintain high quality staff.

Roberts' needs assessment and recommendations, as may be seen, were oriented toward general CTDA management systems, and especially toward functions that were being assumed by the Planning Direction. The management, systems development, and computerized information system recommendations were to some extent implemented. However, these were not, in turn, necessarily reinforced under the other "technical" subprojects either through

TA or training. For example, during the present evaluation, one weakness that emerged was in the area of effective work planning. The Extension Advisor from OSU indicated that Cooperative Extension in Oregon had developed a simple and effective system for work planning which could, with some modifications, probably be tailored to the needs of all of the CTDA Directions, and certainly to the Extension service. This had not been broached, however, perhaps largely because there is no real venue for such CTDA-wide suggestions to be made by a TA specialist housed in one Direction, and involved in implementing one subproject.

Similarly, the new IDA TA specialists who are responsible for on-the-job training of their counterparts and other CTDA staff in project identification, design, monitoring and evaluation, do not have an easy way of exerting influence or making suggestions outside the Planning Direction in which they are placed. This is less the case for the Tunisian Resident Advisor, even though he is assigned to Planning, partly because of his seniority in the GOT and partly because he has been providing TA to the CTDA for over a year, and has come to be trusted. In fact, one suggestion made by the CTDA was that his services should be extended and that he should be moved from one Direction to another so that each one would benefit from his advice and skills.

Under the present PDG, there is apparently a greater openness toward innovations in management than was the case under the former PDG. A management consultant provided under the CTDA's World Bank Irrigated Perimeters project has been able to conduct a participatory diagnostic consultancy, develop a new management system -- financial and substantive -- and this system has been adopted by the PDG. Similarly, a consultant provided under the same project has been involved in designing a baseline data collection effort and a monitoring and evaluation system which may be generalized to other project activities. Acceptance of each of these systems, however, seems to be a matter of the PDG helping his staff to get used to the new approaches, and particularly, breaking old habits in terms of lack of inter-relationships and information flow within the CTDA as a whole. To the extent the present PDG has a delegative approach to management, which is a clear asset to the organization, he may at the same time not be exerting sufficient oversight for the effective adoption of new systems and behaviors.

It may be noted that, as the CTDA becomes less and less AID-dependent, it will receive TA from other donor sources, as well as financing and attendant implementation responsibilities from other GOT programs and entities. The role of AID-financed TA becomes, therefore, more complex, as interaction has to take place not only with all relevant CTDA staff, but also with other providers of TA, where scopes of work may be duplicative, as is somewhat the case presently with project monitoring and evaluation.

Similarly, administration and management approaches can be modified within the CTDA, but it will still remain a dependent of the Ministry of Agriculture, and thus of the GOT, and it cannot unilaterally change all of its systems. Even if the recommendations for modification in its personnel statute and "tutelle" arrangements made in this report are adopted, it cannot totally divorce itself from institutional custom and practice à la Tunisienne. Therefore, short-term TA and training, in order to be cost-effective and integrated into the on-going activities of the CTDA must be carefully tailored, and where possible, involve Tunisian as well as expatriate TA.

Short-term TA has also recently been provided by IDA for particular beneficiary impact studies, one a study of household dynamics and the organization of production, and the other, an analysis of employment generated by CTDA projects. Each of these was carried out by an Arabic-speaking expatriate researcher, and each researcher had a relatively short time to carry out research in the field and subsequent analysis. In both instances, two Tunisian research assistants were employed from outside the CTDA.

While the studies provide useful information, they have not had a training impact on members of the CTDA staff who are, theoretically at least, responsible for carrying out studies of this and other sorts. One of the key weaknesses discussed elsewhere in this report (Chapter IV and Annex B) is the lack of appropriate baseline data collection and socio-economic data collection and analysis. The presence of these two experienced researchers in the CTDA region should, we believe, have been designed to have a training impact both for study design, data collection and data analysis, even though most of the data in these two instances are qualitative, not quantitative.

For the long-term resident TA, this training aspect is also crucial. This is not the first evaluation to stress the importance of this aspect as part of the TA specialist's function in an organizational context. Examples of really effective counterpart training by expatriate advisors are unfortunately few, although many such advisors have done very well in doing the work themselves.

2. Rural Extension and Outreach

The situation with regard to TA provided under the Rural Extension and Outreach project by Oregon State University seems to be in some ways typical of this common problem. Some of the advisors, including the chief of party, have been able over several years to establish relationships of trust and confidence with their counterparts at the central and sub-division levels of the CTDA. At the same time, those who were charged with technical innovations, e.g., cost-effective and water-saving irrigation techniques, have been able to develop successful interventions,

while effectively training at least one counterpart. Others whose scopes of work are more institutional than technical may have a harder time demonstrating results, since such results are not concrete in the same way.

Changes in the way in which extension is organized and carried out have, indeed, eventuated as a result of TA provided under this subproject. The development and dissemination of improved technical messages has, to a certain degree, taken place. This is true despite the fact that the last two years of data from the related Dryland Farming Systems subprojects have never come back to Tunisia from OSU, so that there is little to base new messages on. Some aspects of the project as designed have, however, gone begging, including the component that was intended to reach women farmers more effectively through the development of messages or packages of themes addressed specifically to women. The fact that women and girls carry out a great deal of agricultural work, and are involved in all of the new horticultural activities on irrigated perimeters makes this project weakness particularly relevant.

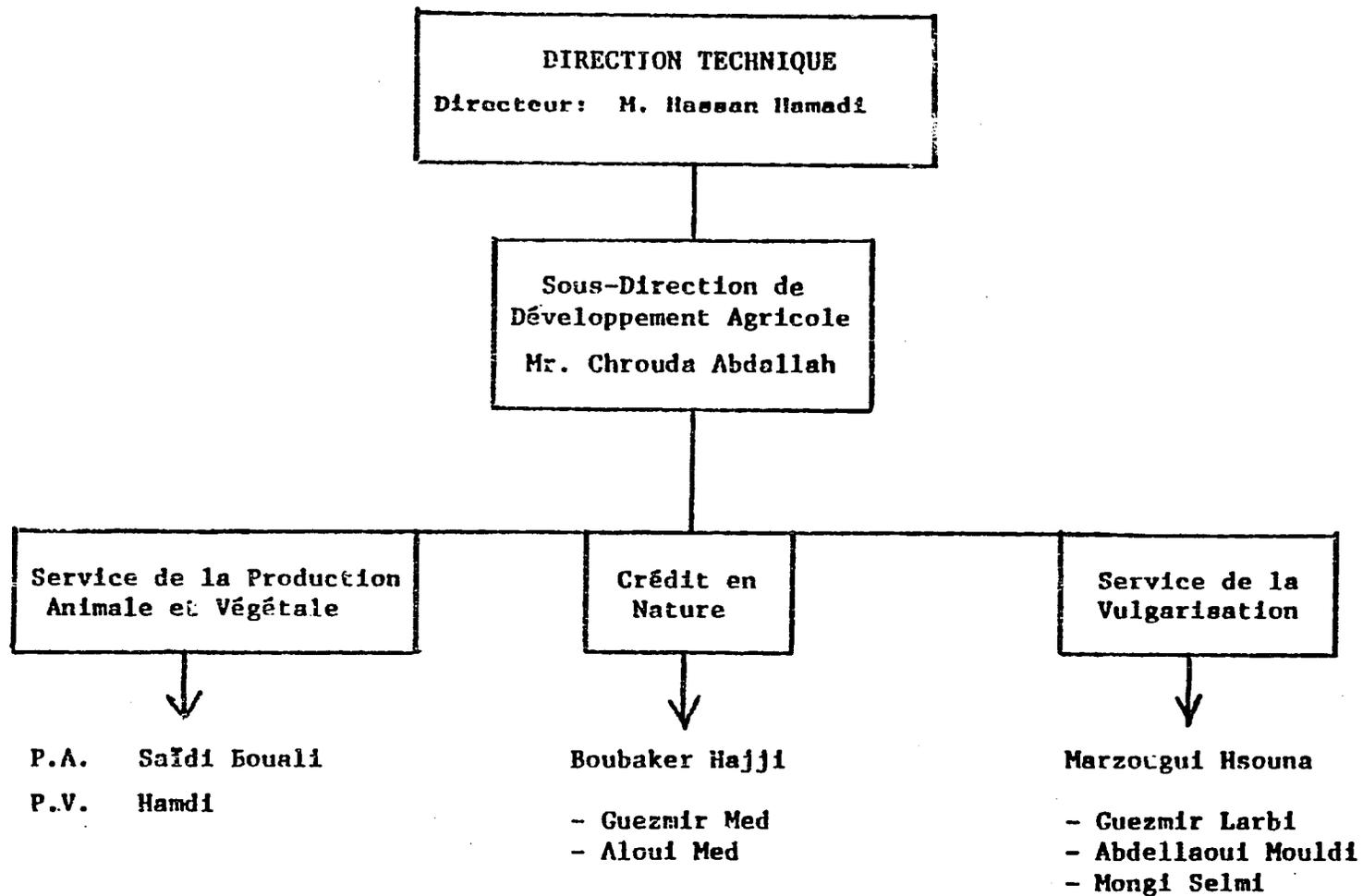
An additional project element that was not pursued under this subproject was the naming of a head of extension and the associated creation of a separate Extension Direction. While there is a titular head of the extension service, this service is still under the Agriculture Direction, with its head reporting to the Director of Agriculture (see Figure 7). Whether the TA specialists could have moved this key institutional change along during the life of the project or not is difficult to determine, even with benefit of hindsight. However, it is worth noting that the organizational/management TA and training that was provided by other institutions under the Area Development Subproject could have been accessed to assist in this had it been tried. Similarly, the World Bank consultant prepared a new organization chart for the CTDA which has been accepted. It is not clear, however, whether he was encouraged to contact the U.S. expatriate TA funded under the AID subprojects or not, and vice versa.

3. Recommended TA for a Farm Management Economics Component

TA is recommended for a new farm management/micro-economics capacity building activity in Extension. A Tunisian agricultural economist, US/UK-trained in farm management economics with some experience since his training, should be hired as a Resident Advisor. The task will be to develop the methodology for a regular survey of a sample of farms in the CTDA area and for the storage and analysis of these data. Since the intention of the survey is to develop a time series, his tenure at CTDA should be for at least two years and preferably three. At the same time the Extension activity should be upgraded to an Extension Directorate level.

Figure 1

Organization Chart of
Extension Service Support Unit



Two assistant agricultural economists should be hired who would assist with the preparation of the surveys and the training of the interviewers (who would initially be subdivision staff, mainly extension agents) and initial analysis of results. These staff members would probably be of the educational level of the current Service de Production Végétale cadre, i.e., baccalaureate plus two years at an Ecole Supérieure d'Agriculture, with some specialization in agricultural economics. It would be ideal if these staff had practical agricultural experience. Additionally, some clerical assistance would be required to do data extraction and input into the computer.

The agricultural economist's role would be to integrate the CTDA data collection frame with that of other services already concerned with this work in agriculture. This task will have been made easier by the data assembly in cooperation with other services which the Planning Division of CTDA recently undertook for the 7th Plan.

The agricultural economist would also assist in evaluating technical proposals before they were extended to farmers and in assessing/surveying the markets for crops which are being grown in Central Tunisia. In this, the cooperation of the Resident Advisor who is currently working in the Planning Division would be solicited. In fact, it is to be hoped that these would be close working relationships between ESSU and the Planning Division since the output should be complementary as regards special studies and the socio-economic aspects.

Once trained, the two adjoints techniques should be able to continue the routine farm management surveys with specialized inputs for analysis, interpretation and special studies.

4. Dryland Farming Systems Research

Long-term TA provided under the Dryland Farming Systems Project to the Ecole Supérieure d'Agriculture at Le Kef (ESAK) had been terminated by the time this evaluation was carried out. Thus, it is difficult for this team to assess its impact. To the extent that Le Kef has been unable since the TA specialist departed to prepare or disseminate its research reports on time, despite repeated requests from the CTDA, institutionalization of project elements seems to have been poor. The problem of analysis of research results at Oregon State, mentioned above, continues to exist and should be rectified immediately, with USAID/Tunis exerting whatever leverage is necessary before the subproject is allowed to terminate in September.

Problems of inappropriate equipment and vehicles procured under this project were raised with some passion during our discussions at Le Kef. If at all possible, USAID/Tunis should see whether there is a way to dispose of this equipment by sale so that more

appropriate equipment--particularly at least one vehicle and better meteorological equipment--could be purchased locally or from Europe. To the extent that inappropriate choices were made by OSU TA specialists, the TA can be faulted. But to the extent that the problem was unwaived "buy American" regulations and poor project design, AID must be held responsible rather than the TA contractor. The fact that heavy equipment was brought in for on-farm trials seems to have been part of the basis for the selection of inappropriate vehicles to pull it, thus increasing gas consumption and overall vehicle expense. Whether this choice results from contractor or AID management decision making is beyond the scope of this annex to determine.

5. Range Management

To date, the US TA provided under the Range Development subproject appears to have been very satisfactory as judged by the OEP counterpart Director and his staff. Oregon State University has this TA contract also. However, there appear to have been difficulties from the outset in coordination and interaction between these TA specialists and their OSU colleagues providing TA under other subprojects. Discussions indicate that this is usually attributed to schisms in organizational responsibilities back at the OSU home campus, between the Office of International Programs and the Range Management Department. While we are aware that such cleavages frequently exist at US land grant universities, we also believe that such an institution, when operating three separate but substantively related contracts with one AID Mission, and in one host-country region, should be able to overcome internal divisions of this kind.

As is often the case with Title XII contracts with AID, some of the TA specialists under these three contracts are not really OSU faculty, so that they have no institutional loyalties to bring to project implementation and management, nor do they have institutional clout within the university to improve home-office support. This seems to be the case here, and has probably exacerbated the intra-OSU management problems. As we noted in the main body of this report, we recommend that all the parties involved meet to review the various management and coordination problems among the various OSU contracts, particularly as these affect institutional strengthening in the CTDA. Based on these results, USAID should take appropriate steps either to modify existing contracts or to seek new contractor assistance. This becomes particularly urgent if the Rural Extension and Outreach subproject is to be extended again, as we are also recommending.

6. CTDA Utilization of Expatriate TA

Pat Demongeot, the "father" of the CTRD project, prepared in 1982 an extremely valuable evaluation paper on the project, which was published by AID in 1983 as "The Central Tunisia Rural Development

Project: Lessons of Experience". While he goes into the history of the TA provided under the Area Development subproject in great and useful detail, he says very little about TA provided under the other subprojects. However, he makes an important point about the utilization of short-term versus long-term TA where there are a variety of technical areas to be covered, as well as an institutional strengthening objective:

"When an IRD project's principal objective is to build up a broadly-based institutional capacity for managing development and when technical expertise in a variety of fields (potable water development, agriculture, health, etc.) is needed, it makes sense to rely on short-term consultants for technical expertise and on the resident advisor(s) for project management skills and a good understanding of institutional development processes. When, however, a particular expertise (e.g., regional planning) is a central element of technical assistance, it is important that the principal resident advisor shares this expertise. Otherwise, it is difficult for the TA team to share... a 'common approach' to project implementation" (p. 42).

This observation suggests what might be an improvement in utilization of the disparate long and short-term advisors being provided by various contractors under differing arrangements and subprojects to the CTDA. Presently, TA advisors tend to be compartmentalized in the respective Directions in which they are working. Some feel, indeed, as though they are being used to fill in vacancies in the CTDA organization chart rather than as advisors and on-the-job trainers. The exception, de facto, is the Tunisian resident advisor who is provided under the overarching Area Development Subproject. What might, then, be useful would be if this individual were given the responsibility of designing a system by which there would be meetings between and among the TA advisors based on concrete decision-making requirements that affect more than one Direction--e.g., the creation of and improvements in the data bank, the utilization of the new implementation plan system, improved utilization of computer technology, the development and application of the project monitoring and evaluation system, and the like.

This would not mean that the Tunisian Resident Advisor would have any supervisory authority over the other advisors, but rather that he would serve as a facilitator for improved communication among, and utilization of, the other advisors as well as himself.

Such meetings or seminars would have to be based on real topics, mutually agreed to by the Direction heads, and the PDG if necessary, so that key CTDA staff would be willing to participate, and see it as in their interest to do so. Such seminars would be of benefit in organizational development terms, but would also have a de facto training function, which is part of the scopes of

work of all of the TA advisors. In some cases, e.g., for the monitoring and evaluation system and the "tableau de bord", such seminars should include subdivision heads and field personnel. In others, they might be restricted to TA staff and Direction heads, or even to subsets of several Division heads and their service heads (e.g., Planning and AHA, or AHA and Agriculture, or Agriculture and DAAF).

Generation of such a meeting/seminar system under the guidance of the Resident Tunisian Advisor could be the product of a meeting of all concerned parties with the PDG on the subject of improved TA utilization. If this were the case, it would have his stamp of approval, and would likely be taken more seriously. He could also then participate in those meetings or seminars that involve issues over which he has ultimate decision-making authority, and/or about which he is particularly concerned and which affect the whole organization, such as documentation and information utilization.

B. TRAINING

Since the beginning of the CTRD Project, a considerable amount of long and short-term training has been provided under the various subprojects -- in Tunisia, in the U.S. and in third countries. Table C 1 indicates, for example, the training provided under the Rural Extension and Outreach Project, which seems to have been more extensive than for any other subproject except Range Management.

The Range Management subproject has provided for long-term participant training in the U.S., which is still on-going. Three persons were to depart for long-term training in June, 1984. Four additional persons were to receive B.S.-level training, of two years each, two to depart in 1985, and two in 1986. These individuals were to major in range science with minors in agricultural mechanics, agronomy, seed production and range utilization. Three additional persons were scheduled for M.S. degrees, two in 1985 and one in 1986. These too would study range science, with minors in seed production, range improvement, range management and utilization. Five persons a year were to go for short-term training in 1985, 1986 and 1987.

Under the Area Development subproject, training was initially to be provided at the CTDA by the various University of Wisconsin and Cornell University TA specialists. This was begun, but after a few training sessions, the CTDA staff who were supposed to be benefiting from the training apparently objected to the training program provided, and the training seminars on regional planning were discontinued. Training sessions on the use of micro-computers for carrying out and analyzing a macro-social inventory to generate baseline data were somewhat more successful, and it is still possible to talk about this experience with some of the CTDA staff who participated. The system of data collection

and analysis, however, was scrapped. Subsequent additional training in use of micro-computers was provided by a non-U.S. trainer and is said to have had better results. This was part of a training package provided through a Tunisian consulting firm, following Roberts' recommendations after the 1981 evaluation.

Dryland Farming Systems Research also provided long-term participant training in the U.S., and a significant number of these participants are still teaching and doing research at El Kef. Two plant breeders have been involved in the development of improved barley varieties and other improved plant varieties that will in time be of considerable benefit to the region. While they bemoan the fact that the project did not provide for research lab equipment as well as equipment for field trials, they seem to be carrying on research activities, and should be receiving additional operating funds under the PL 480 program, Title I.

The new Potable Water Institutions project will provide training in Tunisia for various persons involved in maintenance of well-drilling equipment through the use of long-term TA advisors. Short-term iterative training will be provided by a local organizations specialist to the four Tunisian social scientists to be hired for the "self-management unit", to be established in CTDA under this project. There will also be some short-term, iterative health education training. Unspecified short-term TA of up to 37 months is envisioned perhaps to include health education, action-research and group formation skills of staff in the "self-management unit" or for other purposes.

One feature of the training provided under the CTRD which has seemed quite striking to the evaluation team is the failure to send any participant for training in agricultural economics, farm management, or a similar field or discipline. While the team is aware of the number of such participants sent in the past under other projects, including the Minnesota project with the Planning Direction of the MOA, it is also aware that such individuals have primarily been promoted out of technical positions in the GOT, have left the government, and/or left the country. To the U.S.-trained members of the team, at least, the failure of an organization as broad ranging as the CTDA to have any senior agricultural economics expertise represented on its staff is a critical gap which should be filled as quickly as possible.

Consideration should be given to ways in which one of the existing U.S. or U.K.-trained agricultural economists might be persuaded to come to the CTDA for two or three years as outlined in the TA section above. If this is not possible, other means will have to be explored, including the provision of short-term TA from the U.S. to set up the farm management survey system, and to return to monitor progress from time to time. Part of the requirement for the success of this system is, however, training of the two adjoints techniques mentioned above, as well as of the subdivision

heads and their extension agents, who will have to do the data collection. While farm management surveys in themselves are not very complex, the ability to ask the questions of the farmer properly, patiently, and in a way that will provoke reasonably accurate answers is a skill that takes some time to develop. Since, as some members of the team noted, extension agents generally are used to telling farmers what to do, rather than to listening to them, this can be a real problem in an extension service that is starting to carry out a system of this kind.

If short-term training in data analysis is to be provided under this survey component, it is also recommended that such training be made available to various members of the staff of the DPE who may not, necessarily, have had much recent training in quantitative data analysis techniques. Similarly, some thought should be given to finding appropriate software to facilitate putting these data into the CTDA data bank using the Apple computers CTDA presently has.

A number of the recommendations included in the body of this report have training implications, especially those that involve data gathering and analysis of various kinds, including that just discussed. The ways in which this training can best be provided -- both in terms of appropriateness of content and method and in terms of cost-effectiveness -- are less easy to identify during an evaluation exercise of this kind. Indeed, some of this kind of training is anticipated on-the-job from the two IDA anthropologists working in the DPE. Similarly, some on-the-job training in survey methods for baseline data collection has been provided by the World Bank evaluation consultant.

This evaluation, however, is recommending some significant shifts into areas which no Direction of the CTDA has explored before from a studies or an implementation point of view, especially marketing, agro-enterprise, local organizations (with the exception of the recent work done by a consultant on water user associations), farm management, and the like. We are not recommending these kinds of studies for their own sake, but because they are necessary in order for the CTDA to begin to identify, design and eventually, perhaps, implement activities in these areas. Coincident with such capacity development, there will also be a need for increased capacity in micro-computer hardware, software, and utilization.

We are very much aware of the staffing limitations that the CTDA is currently experiencing and is likely to continue to experience. Even with a new personnel statute, the likelihood of CTDA being able to hire more than a few additional professional staff in the near term is very slim. Thus, we are emphasizing training and re-training for existing staff, which should coincide with some shifts in their present responsibilities away from some of the things they are presently doing. On the whole, we

emphasize that this kind of training should be made available on the job, and in Tunisia if not actually at CTDA, since recommending spending precious staff time away for U.S. or Third Country participant training is not a viable option for the CTDA at this point. In some very limited cases, short-term U.S. training, carefully tailored to the needs of the CTDA staff member, may be advisable. In one case we would recommend long-term participant training, e.g., for the present Director of the DPE.

The consultancy carried out by Dr. Roberts after the 1981 evaluation to determine training and TA needs seems to have been a useful exercise. We recommend that a consultancy be funded, which will look at the training needs of all of the CTDA Directions, at both the subdivision and headquarters staff levels as well as the ways in which needs can most effectively be met in terms of the other recommendations and conclusions of this evaluation.

C. ANALYSIS OF INSTITUTIONAL BEHAVIOR QUESTIONNAIRE

1. Background

CTDA's present management system and institutional behavior were assessed, for the purpose of this evaluation, through interview, participant observation, documentary research, and by the preparation and administration of a questionnaire on intra-and inter-institutional behavior (see Annex G). We have analyzed the results of the questionnaire exercise, which involved all of the subdivision heads and some of the Direction heads, as exhaustively as possible. The results and their analysis permit us to characterize some of the CTDA's internal departments and to present conclusions from two points of view:

- o The general problems of supervising agricultural development activities and the kinds of management behavior required to solve them, as well as the subdivision head's expressed desires for certain improvements in this regard, and;
- o The problems that are specific to certain management activities or operational categories, such as the CTDA's role in development in the region, its relationships with its various partners, and their relative significance in helping the CTDA to realize its development mandate.

The remarks and conclusions presented below concern the second set of problems and observations, and are presented in very summary form.

2. Analytical Breakdown

Our attempt to assess the responsibilities and management styles of the subdivision heads has been achieved, either directly, by asking them what criteria can be legitimately considered as valid bases for assessing their performance, or indirectly, by weighing their answers to a set of specific questions about such factors as motivation, promotion, etc...

For example, question 19 on the factors which motivate improved or increased performance as we have analyzed responses indicates that a key motivational factor is increased authority and responsibility, with increased salary a close second:

	<u>Criterion</u>	<u>For</u>	<u>Against</u>
o	Salary Increase	11	3
o	Easier promotion	8	5
o	Training and Retraining	9	6
o	Delegation of more authority	12	3
o	Rotation to another area	3	12
o	Other (miscellaneous)	4	11

The CTDA's future success would seem to depend largely on the motivation and ability of key staff to do their best work. The organization should, therefore, develop compatibilities between its institutional objectives and the objectives, preferences and needs of its personnel. Improved communication seems to be a key variable in this area. Analysis of expressed needs and preferences of field-level staff, such as those obtained through this questionnaire, can be assessed, and form the basis of a training plan, for example. In such a plan, important subject areas would be:

- o Extension and the management of agricultural enterprises and farm management;
- o Administrative supervision and staff management techniques;
- o Irrigation development and maintenance;
- o Project identification and management techniques;
- o Planning, design, implementation of projects and programs;
- o Information management techniques and tools;
- o Seminar series for continuing education and training, on a variety of relevant subjects.

The significance of training and continuing education is considerable for an organization which is still in a growth and refinement phase, such as the CTDA. This may be especially true to the extent that answers to other questions indicate that staff believe that they are assessed on the basis of personal performance (9) as against overall team performance (9) at least some of the time. Organizational adjustments will be successful

only to the extent that staff are able to accomodate themselves to these adjustments. One clear indication from the questionnaire responses in this regard is that increased decentralization of decision-making would, according to the subdivision heads, be a keen source of motivation. Commentaries by senior staff, however, indicate that what these key field staff really mean is decentralization of budget authority.

The present organization chart of the CTDA, recently revised, shows the various hierarchical levels and identifies the responsibilities of the operational departments (see Figure 3). Analysis of questionnaire results regarding internal management interaction shows that the directions/divisions with which the subdivision heads believe they have the most contact are:

<u>Directions/Divisions</u>	<u>Most</u>	<u>Second Most</u>
General Directorate	7	3
DPE	3	5
Budget	3	2

Those directions/divisions cited as characteristically least contacted, in order of decreasing frequency are:

<u>Directions/Divisions</u>	<u>3rd</u>	<u>4th</u>	<u>5th</u>	<u>6th</u>
AHA	1	1	3	7
Agriculture	1	1	2	9

These responses seem to indicate that, given the tendency toward centralization in the CTDA, the directions with which one would anticipate field staff to have most contact--AHA and Agriculture--are in fact relegated by them to last place in answering the question. If these results are reliable, they would seem to indicate a need for a reorientation of the CTDA's internal management structure and style such that the subdivision heads are more closely integrated into the work of these directions especially with regard to activity planning up front.

The most plausible explanation for the responses given is that, in trying to get guidance on these central matters of irrigation and agricultural extension, credit and the like from HQ, the subdivision heads perceive that responses come from the decision-making level, which is, for them, actually the top--General Directorate or the Director himself. An alternative interpretation is that the irrigation, health, potable water and other activities run by the AHA don't heavily involve the subdivision heads. These responses and their accurate interpretation by those who are involved in decision-making and information flow within the organization should have serious implications for CTDA's future management style, especially as this regards decentralization.

The use of the "tableau de bord", which is still evolving within the CTDA is seen by the respondents as providing a means of:

- o Better activity monitoring--11/14 responses (71%);
- o Guiding subdivision activities--9/14 responses (64%);
- o Facilitating evaluation--9/14 responses (64%);
- o Reporting to HQ--9/14 responses (64%);
- o Communicating with HQ (more two-way)--8/14 (57%).

Methods used for communicating project/program ideas from below, as well as ideas for innovation or change in current activities, are usually institutional rather than personal, e.g., through the Administration authorities such as the Délégués, or through the hierarchy of CTDA itself, which coincides with responses about the involvement of other organisations or entities in CTDA activity identification and implementation:

<u>Other Agency Involved</u>	<u>% of Positive Responses</u>
Delegation	100%
Party Cell	85%
Omdah	80%
Water-User Associations	70%
UNAT	50%

Group and Party meetings remain the main venue for discussions of policy, aid and assistance to beneficiaries, as well as for beneficiary selection and target area definition. When asked how the CTDA's effectiveness could be increased, the following percentages of responses were given regarding better coordination with various entities in the CTDA's institutional environment:

<u>Agency</u>	<u>% of Positive Responses</u>
CRDA	100%
OEP	78%
PDR	71%
UNAT	71%
PSD (Party Cell)	57%
ESAK	42%
MOPH	35%

Answers to other questions, as well as team observation and discussions with these other entities, indicate that communication and coordination can be improved with these and other agencies at the programming, implementation, beneficiary selection and target area identification levels. This is why CTDA, in carrying out its development tasks, should revise certain approaches as is suggested by the following synthesis concerning respondents' views on project/program appropriateness and significance:

The program that best meets the needs of the population is:

PDR	64%
Génie Rural	28%
PDRI	21%
AID	21%

The program that is most beneficial to:

farmers		
PDR (78%)	AID (21%)	PAAF (14%)
CTDA		
AID (43%)	PDR (28%)	PAAF (21%)
the region		
PDR (71%)	AID (28%)	Youth Employment (35%)

The subdivision heads were also asked to indicate which other programs were operating in their respective action areas. The responses follow:

<u>Program</u>	<u>% Responses</u>
Family Gardens	85%
PDR	78%
AID	71%
PAAF	64%
PDRI	50%
Genie Rural	50%
Health	45%
Productive Family	42%
Youth Employment	35%
FDC	7%

The range of programs is perhaps no so vast as it first appears, since all of the above programs can be placed under one of two headings:

- o Agricultural development activities of the type managed by OMVs in other regions, and;
- o Activities designed to improve the quality of life by meeting basic needs.

If we attempt to characterize the proportion of these two types of activities undertaken by the CTDA since its inception, we would estimate that the breakdown is roughly 80% agricultural development and 20% quality of life/basic needs activities.

In future, CTDA should perhaps seek a better balance between productive and non-productive activities, as is indicated elsewhere in this report. Interestingly enough, however, most subdivision heads indicated that they believed that there should

be more attention given to quality of life improving projects and activities rather than less. This would seem to correspond with their favorable responses about the PDR, which is almost a give-away program.

Whichever decisions are made by the CTDA, and supported by USAID, it would be worthwhile if corresponding institutional reorientations and improvements in management could be considered and implemented, involving to the greatest extent possible, implementing field level staff.

D. USAID/CTDA RELATIONSHIPS

Part of the scope of work for the evaluation team was to make recommendations about the types of changes in organizational structure and management practices necessary to improve planning and project design functions. Another part asks the team to recommend, as appropriate for USAID, whether and if so how, to 1) continue to assist CTDA's program, 2) establish the terms and the basis for continued assistance to Central Tunisia over the next five years, and 3) redesign ongoing Project activities.

Various points and recommendations in this regard have been made in the main body of the evaluation report. On the whole, however, we have not yet addressed the matter of the tenor and manageability of USAID/CTDA relationships. Since this question relates to the three questions enumerated above, we feel that some effort should be made to address it here.

1. USAID Management Capacity

As has been mentioned in Chapter II, the CTRD Project and its first three subprojects were designed as a parting gift, or "golden handshake" to the GOT at the time when the AID program was to be phased out (1978-79). The effort was to provide both an overarching planning capability for the newly-created CTDA, and sufficient budget, in the form of the subprojects, to keep this decentralized agency in operation once USAID had pulled out. Thus, the question of USAID's management capacity in Tunisia was probably given less attention than would otherwise have been the case. At the same time, considerable use of AID/Washington cooperative agreements with U.S. universities was built into the project design, so that some AID management backstopping capacity would be automatically provided through those mechanisms.

Over the years since the CTRD Project was initiated, additional subprojects have been added. Contrary to the expectations of the original project design, these additional subprojects have been designed by USAID itself, rather than by CTDA, often using US contractors. This has also been the case for evaluations of these subprojects (e.g., the Range Management evaluation and redesign and the 1983 evaluation of three original subprojects). This, in

turn, has meant that the management responsibilities of USAID, first in the form of the Rural Development Division, and later additionally in the form of a very under-staffed Agriculture Office, have increased incrementally over time. Yet, over the same period, there has been continued talk about a phase-out of the AID program in Tunisia, such that staff ceilings at USAID/Tunis have always been threatened and on the decline.

At the present time, although the USG has decided to increase overall AID program levels for Tunisia, the ceiling on U.S. and FSN staff has essentially been maintained at a very low level. This will, apparently, continue to be the case. Thus, any recommendations from this evaluation that would be very staff-intensive for the AID Mission are likely to be received with considerable reluctance.

To a certain extent, the magnitude of subproject activities is likely to diminish since the Dryland Farming Systems subproject is going to be terminated. The Irrigation subproject is likely to be extended to include Sened and Gafsa Nord, and continued USAID attention will be required to assess improvements in the credit monitoring system. The new Potable Water Institutions project will require some intensive management during start-up, but then should be relatively straight-forward except for the water user associations portion. This evaluation has called for a minimal extension of the present Rural Extension and Outreach project, for one to two years, in order to continue the services of the senior advisor, and to provide for a new and much-needed farm management/micro-economics capacity building activity within the ESSU. A follow-on project may be required later. Range Management has already been revised and extended, but seems to be going along well. (The SCF/CDF Operational Program Grants were not included in our evaluation scope of work, so we cannot comment on them from a management point of view.) The Area Development subproject seems to us to be the appropriate venue for funding some of the additional short-term TA and training activities we have recommended here and throughout the body of the report. Otherwise, at present, it seems to require little USAID management attention except for the Experimental Fund. If our recommendations on that activity are accepted, management intensity should become less of a problem after initial changes are made.

Recently, the Rural Development and Agriculture Divisions of USAID/Tunis were integrated into one ARD Office. To date, however, management responsibility for CTRD subprojects is shared between the former RD staff, who deal primarily with the Area Development subproject and the new Potable Water Institutions project, while a member of the former Agriculture Division manages four other subprojects. It has been suggested by various of the affected AID personnel that it would be managerially advantageous both for USAID and for the CTDA if the present de facto two-track

management system within ARD were formalized, such that technical management would come from whichever officer was most appropriate given the content of a particular subproject, but that "program" (administrative, generalist and financial concerns) management should be centralized for all the subprojects with the former RD staff. So long as such a formalization does not decrease efficiency and face-to-face contacts with CTDA counterparts, it should be all to the good.

2. CTDA and the USAID Agriculture Sector Strategy

The Mission Agriculture Sector Strategy, which is part of the Draft FY 1987 CDSS, includes a proposal for a national-level agriculture sector project.

"To the extent possible, this new effort with its various facets and relationships will be combined into a single project in order to solidify the coordinated approach and to simplify management control and oversight at the USAID level.

"The principal geographic focus will be in Central Tunisia where the experience and developed expertise of CTDA as a coordinating body can be employed to focus on the extension of production systems approaches..." (Draft FY 1987 CDSS).

One real threat to successful relationships with the CTDA in terms of such a national-level unified project is that it would introduce at least one additional level of bureaucracy between USAID and the CTDA, which would make management from both sides more difficult, and would tend to vitiate the good relationships that have been developed between USAID staff and CTDA staff over the past several years.

From a substantive point of view, USAID would be better off reinforcing the substantial gains that have been made in terms of agricultural innovation in the region under the CTRD subprojects by selective redesign and extension of some, and design of others that would restore the balance between emphasis on dryland versus irrigated aspects of the whole farm approach, as well as emphasizing important, and until now under-emphasized, aspects of soil and water conservation and improved water management.

At a more abstract, but equally important level, introducing a single national project and coordinating body placed between USAID and the CTDA goes directly against the GOT decentralizing and deconcentrating trend that USAID has been trying to support since 1976 under the CTRD Project and its predecessor project in Siliana. At a time when there are at least some clear moves on the part of the GOT to reinforce rather than to reduce decentralizing trends, such a move on the part of USAID would be particularly unfortunate, and would send a negative signal. This is particularly true given the GOT emphasis, in part realized, on "regional planning" and "regional development" through the

creation of the COGEDRAT and the funding of the PDRI. Even if USAID does not agree with the scope and funding level of the latter program, to reverse itself on decentralization is at best inconsistent and at worst likely to be detrimental not only to the CTDA -- an agency virtually created through USAID support which has largely succeeded -- but to other decentralized entities for which the GOT has, to some extent, used CTDA as a model.

3. CTDA, USAID and the Ministry of Agriculture

Formally, CTDA comes under the Director of Office de Mise en Valeur et de Périmètres Irrigués within the Ministry of Agriculture. For USAID's purposes, however, contact is either directly with CTDA -- through the PDG or individual Directions depending on the subproject and issue in question -- or through the Direction of International Cooperation at the Tunis MOA headquarters. At various points in this evaluation exercise, the evaluation team came to be aware that relationships between CTDA and International Cooperation within the MOA are strained. This has caused significant delays in a number of respects, most recently for the signature of the last extension of the Oregon State University contract. At the same time, CTDA has support at the Ministry of Plan, in the form of the former PDG, as well as through the present Tunisian Resident Advisor, a senior MOP cadre.

While these informal relationships are often facilitating, and are at any rate typical of the way business is most effectively done in Tunisia by Tunisians, they generally are not appropriate for USAID as a bilateral donor. It, instead, should stick to the channels that it has been given for formal communications with the GOT--in this instance, International Cooperation in the MOA, International Cooperation in MOP and American cooperation in the MFA.

The introduction of a national-level project with the Ministry of Agriculture, which would of necessity have to have some headquarters-level Tunisian counterpart for management purposes, is likely to give the appearance at least of restricted confidence in the counterpart relationships built up over the years between USAID and the CTDA. Thus, it is not merely a question of introducing an additional bureaucratic layer, which may be inefficient in itself. Rather, it is more crucially a question of de-emphasizing decentralization and of risking the good relationships hard-won over the years.

It would seem to us that an artificial integration of CTRD project activities under a national-level umbrella would be a transparent device as far as AID/Washington and the GOT are concerned, and that the Mission can make more than adequate arguments for why assistance to the CTDA should be excepted from such an umbrella activity.

E. RECOMMENDATIONS

That in designing future assistance to Central Tunisia, USAID work carefully to reinforce gains already made, including in the development of the CTDA as a viable design and implementing organization. In order to ensure this outcome USAID should:

1. Maintain the CTRD umbrella project for the next five years, although new subprojects may be added, e.g., for soil and water conservation, farm management economics, marketing strategies and the like;

2. Ensure that such subprojects follow the selection criteria presented in the original CTRD PP, particularly that funds be provided through the CTDA;

3. Involve the CTDA, DPE and other Directions as much as possible in subproject design, as is currently being done for irrigation in Sened;

4. Avoid, therefore, including CTDA assistance under a new national-level agriculture project, so as to avoid introducing new bureaucratic layers which would reduce USAID's emphasis on decentralization and deconcentration and appear to reduce confidence in the CTDA.

5. For subproject implementation, allow various USAID staff to work directly with the appropriate technical staff in CTDA for technical aspects of project management, while "program" management functions should be centralized within the ARD Office to increase efficiency.

6. That the present resident advisor to CTDA be extended for two more years with a review at the end of the first year as to needs beyond two years. His services should be made available as requested by other directorates in addition to planning.

7. TA is recommended for a new farm management/micro-economics capacity building activity in Extension. A Tunisian agricultural economist, US/UK-trained in farm management economics with some experience since his training, should be hired as a Resident Advisor. The task will be to develop the methodology for a regular survey of a sample of farms in the CTDA area and for the storage and analysis of these data. Since the intention of the survey is to develop a time series, his tenure at CTDA should be

for at least two years and preferably three. At the same time the Extension activity should be upgraded to an Extension Directorate level.

8. Similar input perhaps on a consultant basis is needed in evaluation.

ANNEX F

PROPOSED CTDA/USAID AGRICULTURAL STRATEGY

A criticism made of the Central Tunisia Rural Development Project is concerned with the number of subprojects hung onto a central core which have not always appeared totally coherent and which have had rather loose connection with that core.

Historically this may be explained by the uncertainty of continuity of AID assistance to Tunisia and the experimental nature of CTDA itself (see Chapter II). What is needed for the future is a clear commitment to the CTDA on the part of the GOT, and a clear statement of future AID strategy for the region in support of the actions which it has so far funded. Clearly, the planning exercise for the governorate of Kasserine and priorities for action which will be based on rational criteria should form the basis of that strategy. The results of this planning exercise will be available before the end of 1986 with the publication of the 7th Plan. It is perhaps a pity that the delegations of Gafsa and Siliana which are part of the CTDA action zone will not have the same guidelines but there is a planning criterion framework within which proposals for those areas can now be appraised.

Earlier sections discuss the achievements of the Dryland Farming Systems Research subproject, the Rural Extension and Outreach subproject and the Small Holder Irrigation subproject and the Area Development subproject. The Range Management subproject has recently been evaluated and a new Project Paper approved continuing the project funding until 1988.

Within the context of the CTRD concept, the original portfolio of subprojects for agriculture provided a balance of activities to improve the lot of dryland farmers, as well as the development of irrigated agriculture.

The Dryland Farming Systems Research Project Paper foresaw that there would probably not be measurable output in terms of increased production within the time-frame of the project. The capacity of ESAK to conduct research has been reinforced by the institution building element of the subproject, and the fact that INRAT has created a dryland research station at Le Kef holds out the hope that adoptable proposals might flow in the future. When these proposals are available, CTDA will have the capacity to conduct and cooperate in adaptive trials. However, there seem to be higher priorities for funding which will yield earlier results and which use known techniques. Therefore, it would not seem appropriate to continue funding ESAK further than that already proposed under PL 480 Title I.

The Range subproject is effectively no longer a subproject of CTRD. Its coordination with CTDA has been weak throughout. The latest annual report shows that the area of operations in the CTDA zone is 1154.3 hectares out of a total of 4020 hectares (29%). The project is contributing to Central Tunisian development but not in conjunction with CTDA. The project management claims to have a number of rangeland improvement interventions which are showing promise. When these techniques are thoroughly proven they can be the subject of extension packages available to and through CTDA.

The development of irrigated horticulture and arboriculture has progressed apace. All but some 8% of the known water resources of the governorate of Kasserine are now in use, or programmed. It would appear that there is a need to consolidate what has been achieved in irrigated agriculture.

The farmer now practising intensive irrigated agriculture faces a number of problems among which are:

- o The farm family has a large investment -- much of it on credit;
- o The system of agriculture is new to them;
- o The markets for their products are relatively distant;
- o The extension service is in the development stage itself and is unable to offer advice on farm economics or marketing.

For the future, to assist the farm family -- and thus the economy as a whole -- to optimize its return to the investments, the main thrusts should be:

A. EXTENSION

It should be accepted that creating a polyvalent extension service to satisfy the needs of intensive fruit and vegetable producers is a long-term commitment and that the current CTDA extension capability is still some way short of being able to fulfill its role. When the four new Masters graduates return to CTDA the technical capability of the Extension Service Support Unit (ESSU) will be good, provided they define their roles carefully and program their work. The concept of work schedules and reporting is now well accepted both at CTDA headquarters and in the field and should continue to serve the service well. However, the question of mobility should be examined both with regard to ESSU staff as well as field staff.

A further support element which also requires examination is the communications department of ESSU. The evaluation suggests that there has been constant reliance on technical assistance to operate the unit with resultant discontinuity of performance; that there is too much emphasis on "hi-tech" methods of communication;

that the one Tunisian who has worked in the communications unit for some six years has been constantly passed over for training and upgrading; and that the PP intention that there be rural sociology input has been completely ignored. The head of ESSU, the technical director of CTDA, and the current extension advisor should examine the role of the communications unit, its aims, needs and the support which it should be giving to the extension staff in communicating with farmers. Staffing and equipment needs should be identified with a clear program of development of the unit, rather than the past approach. Perhaps the most useful short-term production would be a portable reference manual for field extension agents, given the range of crops and livestock they are faced with.

The technical services still require soil analysis services. Currently in the CTDA area, there is a CRDA laboratory in Kasserine which is capable of doing pH and calcium testing only and which is very overburdened. It was originally envisaged that the ESAK laboratory would service CTDA needs, but apparently the laboratory was not suitably designed or equipped to undertake this service. Proposals under PL 480 funding may alleviate this situation but it is suggested that the CRDA laboratory in Kasserine be included in the PL 480 upgrading program to service Gafsa as well as Kasserine since the Le Kef location will probably still be an impediment to rapid analysis for those areas. One of the CTDA staff is completing his Masters in soil/plant relationships and should be in a position to assist in the interpretation of results.

A major weakness in the CTDA extension service is in the area of agricultural economics. The Project Paper envisaged an agricultural economics input as well as that of a rural sociologist. Neither has been provided, except in the form of one short-term consultant from OSU. For the future development of extension capability in the area of farm management advice, for evaluating proposed technical changes and for future CTDA planning needs, a start should be made on building up a bank of "whole-farm" data based on sample surveys throughout the area, which should include all farming types -- irrigated and dryland. This survey work should be done in conjunction with other services, such as CRDA.

It is not intended that this should be a one-time baseline study, but an ongoing annual measure of the farming systems as practiced by the farm families of the area. Data should be obtained on inputs and outputs for each crop, the cropping patterns by season and area, the labor inputs in terms of time and costs, marketing methods and costs. A stratified, representative sample of the farms in the area will produce an "area farm" as a basis for planning. The accumulation of time-series data will demonstrate the effects of changes in policy, climate, public taste, etc. In parallel, data should be collected on the other elements of farm family life such as off-farm revenue, educational level,

consumption patterns, measures of health, time use on tasks other than farming, etc.

The Farm Management division of CTDA should be part of the ESSU and undertake the farm management advice and technical proposal evaluation; the data base will also be used by the Planning Division for their broader planning needs in conjunction with the sociological analysis capability which they should have.

The need for continued expatriate technical advice on extension methods is probably not a long-term one now that the Masters graduates are on the point of return. In the short term, however, it is considered that the current advisor's help is still needed to assist in setting the course of the ESSU. The advisor has worked in the ESSU for four years, knows the returning trainees and thoroughly understands the CTDA organization. This long-term commitment is what is lacking in so many projects world-wide and should not be lightly terminated.

In summary, CTDA/GOT should examine what assistance AID can provide and a new project be designed to continue support to the farm households of the area. The CTDA/GOT should also investigate ways of divesting CTDA of credit program management so that neither the field extension agents nor the CTDA itself is seen as debt collectors. CTDA should be in a position to help farmers prepare credit applications -- a capability which will be much enhanced by a farm management data bank (this was also proposed in the 1985 evaluation of the credit program).

Similarly, CTDA should progressively withdraw from providing cultivation services and input provision to allow entry of the private sector -- which includes farmer cooperatives -- into these activities.

B. MARKETING

The production of vegetables and fruit in the area has increased rapidly (Tables 1 & 2), and is far outstripping population growth (Table 3). This implies a marketing problem since, although it is probable that dryland farmers turned horticulturalists may have shifted their consumption patterns, the whole of this increase cannot be consumed at home and would scarcely fulfill the development aims if it were.

The irrigated farms are widely scattered throughout the area. There are concentrations of farm families on PPIs but the surface wells are often a long way from good roads and long distances from the nearest town market. Furthermore, the region is a long way removed from the main centers of population and urban demand such as Tunis and Sousse.

Table 1
Vegetable Production 1982-4

Irrigated Area	Total Production (000 ha)	Yield (MT) (000 MT)	Price
Potatoes 137	10.3	132	13.7
Tomatoes 427	18.7	350	18.5
Artichokes -	1.8	12.7	7.4
Green Peppers 171	18.9	113.3	6.1
Melons/ 239 Watermelons	14.5	310	11.9 ¹⁾
Other -	24.8	330	121
<hr/>			
Total	91.7	1248 ⁽²⁾	

(1) Yields for melons-watermelons have dropped recently because the amount planted under dryland conditions has increased from about zero before 1981 to about 13.700 ha. 1984. This is almost the same as the area irrigated.

(2) 1975 total vegetables were 930,000 MT
1982-4 total vegetables were 1,248,000 MT

Fruit Production (000 MT)

	<u>1975-76</u>	<u>1983-84</u>
Olives	669	512.5
Citrus	147	179.0
Wine grapes	112	72.5
Table grapes	22	40.0
Almonds	24.5	39.5
Apricots	27	19.5
Dates	53.5	66
Other	<u>75</u>	<u>144</u>
Total	349	488.5

Total excluding olives for oil and grapes for wine.

Table 2

FRUIT TREES
In Production New and Old Trees
1984-1985

	<u>In Production</u>	<u>Number of Trees Newly planted</u>	<u>Old Trees</u>
Apples and Pears Total	1,266,300	2,287,300	73,200
Center & South	257,600	597,200	3,200
Apricot Total	298,900	65,900	243,000
Center & South	229,200	41,400	7,200
Pomegranate Total	1,241,200	572,400	25,400
Center & South	720,900	347,200	25,100
Table Olives	96,900	318,100	7,200
Oil Olives	2,095,600	226,600	61,300

Table 3
Populations et Ménages

	<u>Pop. 75</u>	<u>Pop. 84</u>	<u>Pop/Sexe</u>		<u>Pop. Par Milieu</u>			<u>Ménages</u>	
			<u>M</u>	<u>F</u>	<u>Urbaine</u>	<u>Rurale</u>	<u>Rural Aggl.</u>	<u>Nbre Ménage</u>	<u>Taille Moy. Ménage</u>
<u>Kasserine.</u>									
Nord	25071	50290	25753	24537	<u>47606</u>	2684	35,2	8897	5,6
Sud	18244	17181	8689	8492	-	17181	19,5	3001	5,7
H. el Frid	11157	11987	6100	5887	-	11987	12,8	2159	5,5
<u>Sbeitla</u>	38051	48536	24730	23806	<u>12022</u>	36514	7,2	8613	5,6
<u>Sbiba</u>	22084	27954	14263	13691	<u>3255</u>	24699	4,2	4812	5,8
Jedliane	10655	11051	5645	5406	-	11051	17,7	2116	5,2
El Ayoun	9553	13483	6833	6650	-	13483	3,8	2475	5,4
Foussana	25099	31409	16119	15290	-	31409	20,8	5926	5,3
<u>Thala</u>	32506	34959	17656	17303	<u>11767</u>	23192	16,2	6317	5,5
Haidra	9347	9750	4757	4993	-	9750	19,2	1705	5,7
B. Abbès	11891	15311	7793	7518	-	15311	10,6	2527	6,0
<u>Feriana</u>	22356	26048	13233	12815	<u>14400</u>	11648	5,3	4505	5,7
<u>Gouvernorat</u>	238499	297959	151571	146388	89050	208909	12,6	53053	5,6

Les villes principales et leurs populations sont soulignées.

Source: CTDA

Currently, farmers are not formed into cooperative groups and, in the main, undertake their own marketing either through a wholesaler in the larger towns -- Kasserine, Gafsa, Siliana -- or display their production at the weekly markets in the towns and villages in the area. There was little opportunity to examine the attitudes of farmers to cooperative marketing, but those who were questioned seemed reluctant to leave selling to someone else. However, as production builds they will be forced to seek outlets for their produce outside the immediate area.

There is clearly a very active network of traders at all levels, wholesale and retail. Visits to regional markets revealed a variety of operators. On the daily markets (Table 4) in Siliana and Foussana for example, standholders bought most of their produce from local wholesalers or intermediaries who brought produce from the Tunis area. On the weekly markets, sellers varied from those who travelled to a different regional market every day, to the small farmer with a few chickens and eggs for sale.

Tunisia is fortunate in having a good network of tarred roads and farmers seem able to hire small pick-up trucks relatively easily. Larger-scale transportation seems to be limited to fodder. No larger truck loads of fruit and vegetables were seen in the course of the evaluation team's brief visit.

The wholesaling function is undertaken by two types of wholesalers, both of whom operate from the municipal wholesale premises in the larger towns. The majority of the few wholesalers met conduct most of their business as commission agents. However, they can also take possession outright, which is clearly to the disadvantage of those of their clients whose produce is on commission. Commission margins appear to be controlled at 3% of the producer price. The second type of wholesaler interviewed was one who bought all his produce outright, paid the municipality a flat sum per year for the rent of the premises, and charged a gross mark-up of 20% over the producer price. As he was anxious to point out (correctly) his collection transport costs and losses on unsold produce resulted in a net margin considerably lower. Being a very dynamic man, who obviously knew the fruit and vegetable trade very well, he had flourished and was the object of deep suspicion, particularly among members of the bureaucracy. He was reputed to have "broken" one cooperative in the region; on the other hand a merchant who generates a lot of trade in the area generates farm-level demand and should be encouraged, not condemned.

The national ceiling retail prices of fruits and vegetables are fixed every two weeks for those products which are considered in limited supply by the Ministry of Economy, Division des Prix in conjunction with a committee of wholesalers and farmers

Table 4

Jours de Marchés

Foussana	Dimanche
Sbeitla	Mercredi
Kasserine	Mardi
Majen Bel Abbas	Samedi
Feriana	Lundi
Sbiba	Vendredi
Thala	Jeudi
Haidra	Mardi
Makthar	Lundi
Kesra	Samedi
Rouhia	Dimanche

Source: CTDA

representatives. The margin permitted to the retailer is 20% above the wholesaler's price, thus effectively determining the wholesale level. Major additional costs are the national agricultural tax (3%) and municipal taxes, which vary from town to town -- 4 % in Siliana, 14% for Kasserine and up to 20% in Tunis (reputedly although an interview with the Direction des Prix at Tunis proved difficult to arrange).

National price rigidities create marketing difficulties for the producer in Central Tunisia. With his extra transport cost, and high taxes in Tunis and Sousse it is difficult for him to compete with the producers of those areas who, in any case, have a more favorable climate. Similarly, low price ceilings imposed during periods of shortage discourage investment in higher production through the use of more inputs or increased area, or storage to spread the marketing period of those products which, in the next few years, will have to be sold out of the area, e.g. hard fruits.

There is currently one (100 ton capacity) cold store at Sbiba owned and run by CTDA. The record of storage in this facility has scarcely been good, with 12 tons stored for 40 days in 1983; 8.350 tons for 60 days in 1984, and 18 tons for 60 days in 1985. The charge for storage is currently D9/ton per month against an estimated running cost of TD25/ton per month -- presumably based on a fairly high utilization rate. There is a privately-run ice and cold storage plant at Gafsa which was closed when visited, but which one of the local wholesalers uses from time to time.

There are processing facilities in Sidi Bou Zid and in Siliana for tomatoes. Farmers were heard to complain of long (two-day) waits at Sidi Bou Zid to discharge their produce and the plant at Siliana has had a chequered history of breakdowns and lack of technical know-how, rental by a private operator who, apparently, lost money and a prospect that this season it will again remain closed.

There are also no national grading or market intelligence systems which would be useful adjuncts given the long distances involved.

In the time available, only a very limited look at the market was possible but the problems identified by Waldstein⁽¹⁾ in 1982 are still apparent and will doubtless get worse. A World Bank consultant has prepared one report and is apparently returning this year. AID should examine his findings as soon as they become available, see what else needs to be done and attempt to remedy the situation which has been apparent for some time but which is becoming more urgent.

(1)A. Waldstein, ST/ARD, 30th March 1982.

Waldstein noted that CTDA has a policy of not entering the marketing system as a trading entity and this was reiterated by the current PDG of CTDA. This position should be maintained. CTDA could be given the capacity to study the market and provide guidance to farmers and market operators. In terms of its role in project identification it could identify possibilities for private entrepreneurs and assist them in credit application preparation, if need be.

The question of post-harvest technology was not examined, but one suspects that the almost universal use of plastic crates for all products may not always be ideal. Harvesting methods, timing and on-farm storage should be studied for incorporation in the extension packages.

CTDA is involved in the promulgation of cooperatives. Three "centres de collecte" have been constructed, and it is planned that these be given to the cooperatives who would then handle agricultural inputs and market farmers' produce. The legal basis for the cooperatives has been established but there are a number of commercial considerations which should be examined by the CTDA Planning Division before farmers are encouraged to embark on creating cooperatives and entering very risky fruit and vegetable marketing activities. The social aspects also require examination since the Tunisian farmer apparently still harbours suspicion of the cooperative movement failure in the 1960s and the Central Tunisian farmers, especially, have no tradition of group action outside the extended family. Furthermore, the means by which a cooperative wishing to trade in fruit and vegetables could find its niche in the established system should be carefully examined in the light of past experience of failed cooperatives.

A CTDA cooperative marketing study should examine:

The potential for input sales in terms of volume expected and potential margins in order to ensure generation of funds sufficient to make a cooperative viable. The effect of competition from CTDA and other government agencies as input suppliers should also be considered.

If the cooperative intends to handle farmers' produce then a careful study should be made of the present national flows of fruit and vegetables. Past studies have shown the produce tends to flow into the Tunis/Sousse wholesalers and that provincial buyers go there from all over the nation to seek supplies. This pattern is a very typical one in many countries where the assembly and redistribution process takes place in one or two main centers. Producers a long way from these centers can be at a severe disadvantage because of transport costs; established patterns are difficult to break and the distant grower cannot do

it on the basis of price. Therefore, the questions of quality and seasonality must be considered to put a superior quality or out-of-season product on the market.

- o The question of management must be examined. In view of the difficulties of entering the market, the trading manager must be someone who knows the trade and has the right connections in it. Such a manager, almost certainly from the private sector, would require a good salary which, initially, the cooperative could scarcely afford. The cooperative study should also examine ways of overcoming the problem of at what point the cooperative should attempt to enter the market, e.g. by using a particular wholesaler on particular markets, by becoming a wholesaler in its own right or by becoming a retailer, for example.
- o The transport needs and costs should also be examined, both cooperative-to-market and farmer-to-cooperative. Storage, grading and packing costs should also be included.

Although this is seen primarily as a cooperative marketing study, various scenarios should be considered, some of which might identify areas for other private sector involvement. It might be that what Central Tunisia needs is an organization strong enough to compete with the existing businesses in Tunis, Sousse, etc. which were established to satisfy old production patterns which have changed, and will continue to change as Central Tunisia horticultural production increases. It may be that a cooperative structure would be inappropriate for this and that a private company would be more appropriate aided, perhaps, by USAID's Private Sector Development and Technology Transfer Project.

C. SOIL AND WATER CONSERVATION

It is estimated that the average amount of water that flows into the sea from Tunisia is 20,000 million cubic meters. It is evident from the appearance of the rivers that with this water goes a great deal of Tunisian soil. In Central Tunisia, and in Kasserine governorate particularly, water and wind erosion is considered to be more severe than elsewhere in the country. The area of land classed as agriculturally useable in the governorate is some 777,427 hectares of which 162,700 hectares (21%) are classed as degraded.

A great deal of the development investment in Central Tunisia has been in irrigation, the provision of potable water and for industry, some of which industry is very water demanding. Table 10 demonstrates the position of the current known water resources for Kasserine governorate, those which are being used and for which plans are already laid out and the quantity still available. This last now amounts to some 8.7% only.

The total area of the governorate is 827,427 hectares, of which 50,000 hectares are classed as non-agricultural and includes mountains, towns and river beds; 151,085 hectares (18%) are forested. However, large areas of open plain, large plantations of fruit trees and many human habitations (urban and rural) are not protected from the almost constant strong winds (very cold in winter and hot in summer).

There is a recognition in the area that various measures could be taken to tackle the problems of water shortage, erosion and improvement of the environment, but means are limited.

The technical departments concerned at the governorate level are:

- o The Arrondissement des Forêts
- o The Arrondissement de la Conservation des Eaux et des Sols, (CES), and
- o The Direction des Ressources en Eau (DRE).

Each has a program of action in its own field, some of which overlap or are complementary. However, with some rationalization it might be that a joint program would be more efficacious.

The forestry department has programs in forest clearing which involve providing people with settlement areas in the forest and the means -- generally additional livestock -- to improve their livelihood; wind-breaks and wood-lots to improve the environment of the people and provide fuel in this denuded landscape; pasture improvement by planting cactus and acacia; and some pure reforestation. It should be emphasized that these actions do not constitute large-scale afforestation.

The CES also has a number of policies whose aims are:

- o Protection of the agricultural perimeters;
- o Groundwater recharge;
- o Protection of dams;
- o Protection of the urban and road infrastructure.

Means of attaining these policy objectives include the creation of terraces -- mechanically where possible when the slope is not too severe, and by hand and in conjunction with tree planting on steep

Table 5

Répartition de l'Exploitation Actuelle des
Ressources Utilisées (environ 73 millions de m3)

Exploitation	Nappes Profondes Etudiées	Nappes Phréatiques	Total
<u>Quantités exploitables par an</u>			
- millions de m3	73,9	26,4	100,3
- nbre de litres/s	2344 l/s	840 l/s	3184 l/s
<u>Quantité effectivement exploitée</u>			
- millions de m3	50,5	22,4	72,9
- nbre de l/s	1602 l/s	710 l/s	2312 l/s
Quantités programmées 18,6 mill. m3 pour projets en cours et pour des nouveaux projets	14,6 mill. m3 463 l/s	 130 l/s	4 mill. m3 593 l/s
<u>Quantité restante</u>	8,8 mill. m3 279 l/s	- -	8,8 mill. m3 279 l/s

slopes, or in stone where there is a lot of stone available; creation of retention barriers of various materials, depending on availability, in the ravines to prevent torrential flooding; sub-soiling to allow better water penetration and retention; and consolidation by tree planting. These measures aim to slow water run-off and allow ground-water recharge or to reduce wind erosion.

The DRE points to the need for further prospecting for water. The Direction has a program of research for further water resources but is handicapped by lack of funds -- for example funding for reconnaissance wells in Kasserine in 1985 allowed for four prospectings; this year the number is one only. For the aquifers which are known and are being exploited there is urgent need to update both the methods and the parameters upon which present methods are based with improved mathematical modelling. The DRE has used CTDA computers to a limited extent but could make greater use of them if better data were obtained. It must also be said that the DRE does not agree with all the actions of CES, as it is claimed that in some cases the water run-off should be permitted to recharge certain aquifers.

These actions should clearly be coordinated and this is a role which CTDA has found itself fulfilling in the planning exercise which it has just done but which may go by default at the execution stage since CTDA is not charged with the job nor can it fund any actions in this field.

What is lacking in the technical departments is the capacity to assess the social and economic impact of their actions. CES and the Arrondissement des Forêts recognize that their actions can mean the temporary displacement of people or at least a deferment of improved production opportunities. As mentioned the Arrondissement des Forêts attempts to augment flock numbers, while CES provides World Food Program (WFP) food aid as temporary assistance. The DRE clearly regards the provision of water for irrigated agriculture as a "good thing" per se, without economic studies to back this up.

1. Future Subproject in Soil and Water Conservation

USAID/GOT should consider the current strategy for dryland agriculture and the role that soil and water conservation can play in improving prospects for dryland farmers as well as assuring future water sources.

A subproject should be designed in which CTDA has a central role in conjunction with Forestry, CES, DRE, and CRDA in soil and water conservation, prospecting and rangeland improvement. CTDA would be responsible for the socio-economic aspects of these actions and executing the parallel programs.

Veillez répondre aussi clairement que possible aux questions qui suivent. Les réponses sont strictement confidentielles et ne seront utilisées qu'à des fins d'analyses pour la présente mission.
Merci pour votre collaboration

I. Appréciation de la Gestion interne

a. Estimez vous que l'effectif du personnel employé est
- suffisant
- insuffisant

Évaluez vos besoins en personnel

Y'a-t-il des postes vacants dans votre subdivision?

Cochez les programmes spécifiques qui interviennent dans votre domaine d'action?

PDR	PAAF	Emploi des jeunes	famille productive
PDR1	AID	FDC	Santé
GR		Autres	Jardins familiaux

Comment évaluez-vous la collaboration avec ces programmes?

(1,2,3 et cetera, en ordre prioritaire, 1 étant le mieux)

Y'a-t-il une coordination :

Dans la programmation des actions
Dans le choix des bénéficiaires
Dans l'implantation des projets

Si il y a des problèmes éventuels veuillez les citer

À votre avis, quelles sont les solutions à ces problèmes

Parmi ces programmes, lequel vous semble le plus approprié aux besoins de la population

le plus facile à réaliser

le plus rentable pour:

l'agriculteur
l'OTC
la région

L'action de l'Office serait plus efficace si vous coordonniez parfaitement avec quel organisme ou service extérieur, ou programme

CRDA	OEP
PDR	École du Kef
UNAT	Cellule destourienne
UNFT	FDC
Santé	Autres

Relations avec les Directions Centrales

Avec quelle direction avez-vous le plus de contact

Classer par ordre d'importance, de 1 à 6,
1 = Moins de relation 6 = maximum de contact

La procédure adoptée pour les contacts est-elle

- formelle (par écrit; réunions programmées; convocations)
- informelle (téléphone; relations personnelles; visites)

La procédure de prise de contact vous permet-elle de résoudre vos problèmes de:

- gestion courante (personnel, crédit en nature, motoculture déplacements, autres)
- collecte de données par les Directions intéressées
- vous informer ou vous donner la possibilité de prendre des décisions
- faciliter l'exécution des projets

L'utilisation du tableau de bord vous permet de

- rendre compte à la Direction Générale de l'activité
- mieux contrôler l'activité
- orienter l'action de la subdivision
- faciliter l'évaluation de la planification de l'activité
- communiquer avec l'autorité centrale (D. Générale)
- situer la position de la subdivision par rapport aux autres dans les divers domaines d'action

Le tableau de bord actuel vous permet-il de mieux suivre votre activité que celui de 1983 (DMI--Claude Salem et John Buck)

Combien de ces individus ou organismes interviennent-ils dans votre travail et pour quoi faire:

- Délégation
- OMDA
- UNAT
- Cellule destourienne
- UNFT
- ONFP
- Santé
- Associations des usagers d'eau
- Coopératives de services
- Autres spécifiques:

Comment canalisez-vous des idées de projet que vous suggérez vous-même; et/ou que vos relations de travail vous communiquent (institutions; bénéficiaires, autrui)

Si, lors de l'exécution d'un des programmes planifiés vous semble inadéquat ou irréalisable quelle que soit la raison; comment réagiriez-vous?

Pouvez-vous avoir la latitude de changer la destination d'un projet ou son affectation; si oui de quelle manière procéderiez-vous

Pensez-vous que votre fonction de subdivisionnaire vous permet-elle d'avoir la possibilité de prendre des décisions à votre niveau sans demander l'avis préalable de la Direction Centrale

oui non quelque fois

Souhaitez-vous un développement de la décentralisation au sein de l'ODTC; si oui, comment

Est-ce que vous avez bénéficié d'une formation pendant votre vie professionnelle à l'ODTC; si oui, quelle formation et ou

lieu sujet de la formation

- stage à Kasserine
- stage ailleurs en Tunisie
- stage aux USA
- stage en France
- Autres

Avez-vous eu l'opportunité de former d'autres; Si oui; combien de fois, en quelle matière, et ou

combien lieu

- séminaires
- stages
- réunions de travail
- autres

D'après votre appréciation, l'apport de cette formation à votre métier a été:

- excellent
- bon
- moyen
- nul
- ne sait pas

Quel type de formation vous serait-il le plus utile pendant les trois prochaines années pour vous faciliter d'améliorer le métier

Comment évaluez-vous la performance (travail réalisé) de vos subordonnés:

- le résultat du travail personnel du subordonné
- le résultat du travail de l'ensemble de l'équipe
- par éléments chiffrés
- absence d'éléments précis, recours à l'appréciation quotidienne du chef
- autre système à proposer que vous utilisez

Comment pensez-vous que la Direction Générale évalue votre activité

- résultat personnel

-autres critères de l'ensemble

Es- vous satisfait du système d'évaluation actuel

Si il n'y a pas de système que proposez-vous

Pensez-vous que tous les autres subdivisionnaires utilisent les mêmes critères d'évaluation que vous

Pensez-vous que pour inciter le personnel à mieux travailler, il faut:

- augmenter le salaire (primes ou autres)
- faciliter la promotion
- donner plus de pouvoir et de responsabilité
- mutation dans une autre région
- lui donner un complément de formation
- autres motivations à détailler sup

Si vous aviez à définir l'objet de l'OOTC, comment le feriez-vous

- développement multi-sectoriel global
- développement du secteur irrigué
- amélioration des conditions de vie (eau potable; pistes; santé, etc;)
- amélioration de culture en sec
- planification globale de toute la région de la Tunisie Centrale (Kasserine, Gafsa, Siliana, Sidi Bouzid, etc)
- Planification et exécution centrale pour le seul gouvernorat de Kasserine
- Coordination des actions de développement au niveau régional au sens strict; Kasserine seulement;
- Coordination des actions de développement au niveau régional au sens large ce qui veut dire; toute la Tunisie Centrale;
- autres conceptions à spécifier, sup

Comment pensez-vous que le partage de tâches et la coordination avec le CRDA devrait se faire

- collaborer sur le même projet
- séparer complètement les domaines d'intervention
- autres formules à spécifier sup

Comment pensez-vous que le rapport ODTG-autres organismes opérant dans le même champs d'action doit être

- d'exclusivité d'intervention
- de complémentarité
- de collaboration étroite

En vu de la vulgarisation spécifiquement, est-ce qu'il devrait avoir

- un seul service réuni de vulgarisation
- plusieurs services étant donné les différentes sortes de cultures
- plusieurs services; mais intégrés au niveau de l'exploitation (l'agriculteur en face d'un seul agent de vulgarisation)
- autres formules à spécifier, sup

Quel est l'organisme le mieux placé (doté en moyens humains; techniques et financiers) le plus apte à faire oeuvre de développement dans la région

- CRDA
- PDR

ODTC
Secteur Privé

Pour l'exécution de l'oeuvre multisectorielle de développement dans la zone d'intervention de l'ODTC, relevant de vous, faut-il penser à la création d'un comité de coordination technique au niveau de la délégation, ou niveau régional

Imaginez que vous aviez à recommander des changements primordiaux dans le rôle et les interventions de l'ODTC; Entre ces changements; il y aurait les possibilités suivantes; marquez-les par ordre de priorité 1,2,3,4,.

-A SUPPRIMER.

- Planification régionale
- Conception de projets
- Évaluation de projets
- Projets multisectoriels
- Vulgarisation
- Projets d'amélioration des conditions de vie
- Motoculture
- Traitements phytosanitaires
- Crédit en nature
- Gestion de l'eau dans les PPIs
- Amenagement des PPIs
- Équipement des PPIs
- Construction d'infrastructure
- Arboriculture en sec
- Arboriculture en irrigué
- Associations des Usagers d'eau
- Coopératives de service
- Fonds expérimental

A AJOUTER

- Agro-industrie (conception; développement; gestion)
- Commercialisation (fruits et cultures maraichères; collecte seulement; prospection des marchés)
- Construction d'infrastructure (pistes, santé, points d'eau)
- Planification au niveau de plusieurs gouvernorats
- Études des projets pour les autres organismes
- Coordination technique (un seul gouvernorat; plusieurs gouvernorats)

- Augmenter le nombre de projets des petits metiers
- Intensifier la vulgarisation
- Développer des démonstrations et expériences en sec et la recherche agronomique
- Amélioration des parcours
- Recherche appliquée agronomique dans des fermes pilotes
- Analyse des sols
- Santé animale
- Suivi et évaluation des projets réalisés par des autres organismes
- Gestion de tous les projets de développement agricole dans
- Un seul gouvernorat
- Dans plusieurs gouvernorats
- Autres

Les obstacles au développement des activités de l'Office

- dans votre subdivision ou région
- sur le plan global de l'Office

Citer les défaillances actuelles de l'Office

L'Office est connu dans la région par :

- la vente d'eau
- le crédit en nature
- la vulgarisation
- l'étude du 7^e Plan
- la construction de pistes
- la construction de centres
- l'eau potable

Pour mieux intégrer les agriculteurs et la population dans les actions de l'Office, quels sont les moyens les plus appropriés à votre avis

Dans la préparation du 7^e Plan, comment êtes-vous impliqués

- présence dans des réunions et des commissions
- collecte des données
- rapports écrits
- participation avec les experts des bureaux d'études
- non-impliqué

Avez-vous des suggestions pour y être plus efficace?

Comment pensez-vous que l'Office doit se développer dans l'avenir.

Merci