COUNTRY REPORT NO. 1

OPPORTUNITIES FOR DEVELOPMENT:

A RECONNAISSANCE OF CENTRAL TUNISIA

UNIVERSITY OF WISCONSIN
MADISON

REGIONAL PLANNING AND AREA DEVELOPMENT PROJECT
INTERNATIONAL STUDIES AND PROGRAMS

COUNTRY REPORT NO. 1

September, 1979

OPPORTUNITIES FOR DEVELOPMENT:
A RECONNAISSANCE OF CENTRAL TUNISIA

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INTRODUCTION

The University of Wisconsin Regional Planning and Area Development Project has contracted to provide technical consulting and training to the Office de Developpment de la Tunisie Central (ODTC). This consulting, on regional planning for area development, is specifically concerned with the "sketch plan" approach to planning. This approach is characterized by short lead times, flexibility, and an action orientation. In addition it proceeds

simultaneously with several different types of activities.

The principal, initial activity of the sketch plan process is the reconnaissance, and its purposes are as follows:

1. "A fresh view:" People often become so used to a setting that they overlook important problems or ignore possible solutions. One should look at an area as if it were being seen for the first time noting its important characteristics, assets, and difficulties.
2. "A first exposure:" The reconnaissance provides a quick, not detailed, glance at an area. For a small or medium sized area the time involved is modest.
3. "A general survey:" The reconnaissance should be used to identify salient facts and problems that will need to be addressed in the future, as well as provide an overview of the region's social, economic and physical environment.
4. "A catalyst:" The reconnaissance should not only benefit the reconnaissance planning team, but should stimulate local officials and others who have done prior work in the area to rethink their conceptions of the areas' problems and help them discover the gaps in their perceptions and information as well as the gaps in the reconnaissance.

In Central Tunisia the Project, in conjunction with the ODTC, decided to undertake such a reconnaissance in June and July of 1979. Specifically it was intended that this reconnaissance mission would 1) identify actual needs which will lead to experimental projects; 2) identify specific subjects which need in-depth investigation, and 3) provide the basis for be-

ginning regional planning in the area by identifying the social, economic, physical, and institutional opportunities and constraints in the region.

Specifically the following subjects were to be analyzed:

1. Planning: analysis of institutional capacities for development, design of appropriate planning methodologies for regional development, analysis of existing data sources, and design of a regional information system.

2. Natural Resource Management: water utilization and management, and soil conservation and erosion control.

3. Settlement Patterns and Land Tenure: constraints affecting resource and infrastructure utilization, and social service delivery.

4. The Local Economic System: investment and other public and private input decisions, and questions of productivity, profitability and marketing.

To undertake this analysis an interdisciplinary team of regional planners, anthropologists, agricultural economists and natural resource specialists was created composed of the following individuals from the University of Wisconsin-Madison.

A. Reconnaissance of the institutional context.

Mr. George Deikun, Regional Planning and Area Development Project
Mr. Michael Hoffman, Regional Planning and Area Development Project
Professor Leo Jakobson, Chief of Mission, Co-Director of the Regional Planning and Area Development Project

B. Reconnaissance of natural resource management.

Professor Steven Born, Chairperson, Department of Urban and Regional Planning
Professor Wilford Gardner, Department of Soils
Ms. Mary Ellen Vollbrecht, Regional Planning and Area Development Project

C. Reconnaissance of settlement patterns and land tenure

Dr. Concepcion Lee, Regional Planning and Area Development Project
Professor Aidan Southall, Department of Anthropology

D Reconnaissance of the local economic system

Ms. Laurie Cohen, Regional Planning and Area Development Project
Dr. Diane Miracle, Regional Planning and Area Development Project
Professor Marvin Miracle, Department of Agricultural Economics

Taken as a whole then this reconnaissance was to set out the basis of the sketch plan approach which consists of: actual projects whose effect and impact can be evaluated; a continuing process of selecting currently important issues for detailed examination; and the provision of a spatially presented sketch plan, which would be the framework for integrated area development.

II. THE SETTLEMENT PATTERN AND LAND TENURE RECONNAISSANCE

A. Introduction

This section presents a brief sketch of the important elements of population, social organization and land settlement patterns for the Central Tunisian area. The information incorporated here was taken from the following documents:

1. Projet de developpement rural integré, Tunisie Centrale, Rapport General 1974, Tunis.

2. Population Census of Tunisia (Récensement Général de la Population, 1975)

3. Nicholas Hopkins-Social Soundness Analysis of the Drylands and Irrigation Components of the Proposed Central Tunisia Rural Development Program (USAID, 1978)

4. Giancarlo Castelli Gattinara and Laroussi Daoud. Aspects socio-économiques et culturels des populations de la steppe tunisienne face à un programme de développement (FAO-Sida, rapport technique no. 50-8).

5. Habib Attia, Mutations de la Société et de l'espace dans les hautes steppes. No date, Tunis. (these de 3eme cycle polycopie)

6. CNEA, Monographie de Hababsa, étude socio-économique d'un secteur rural, Tunis 1978.

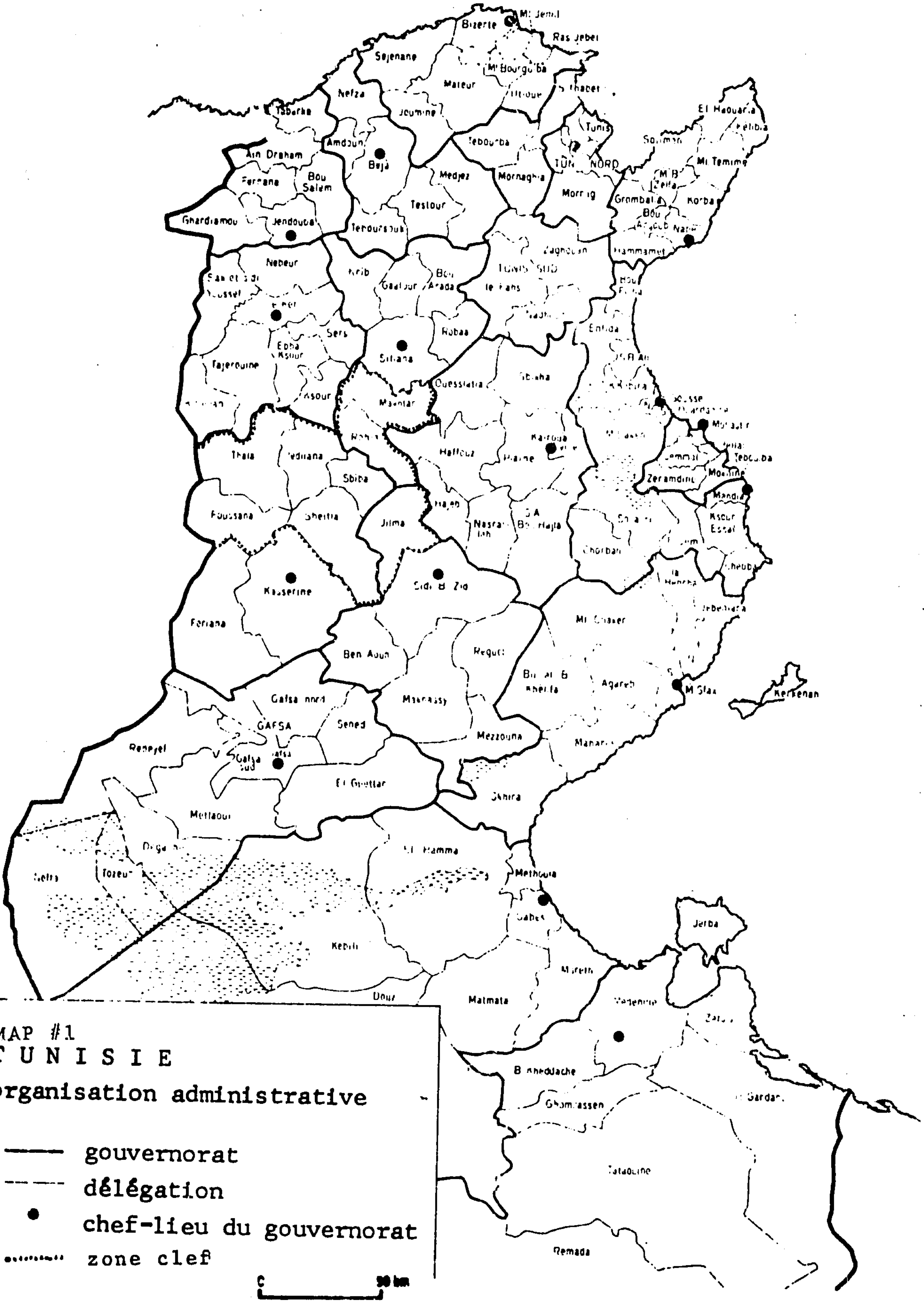
7. Concepción Lee, Nomads, Farmers and Migrant Labor in Southern Tunisia (PhD Disertation, Anthropology, University of Wisconsin 1979)

Wherever possible this information was supplemented by observations made during the brief reconnaissance mission.

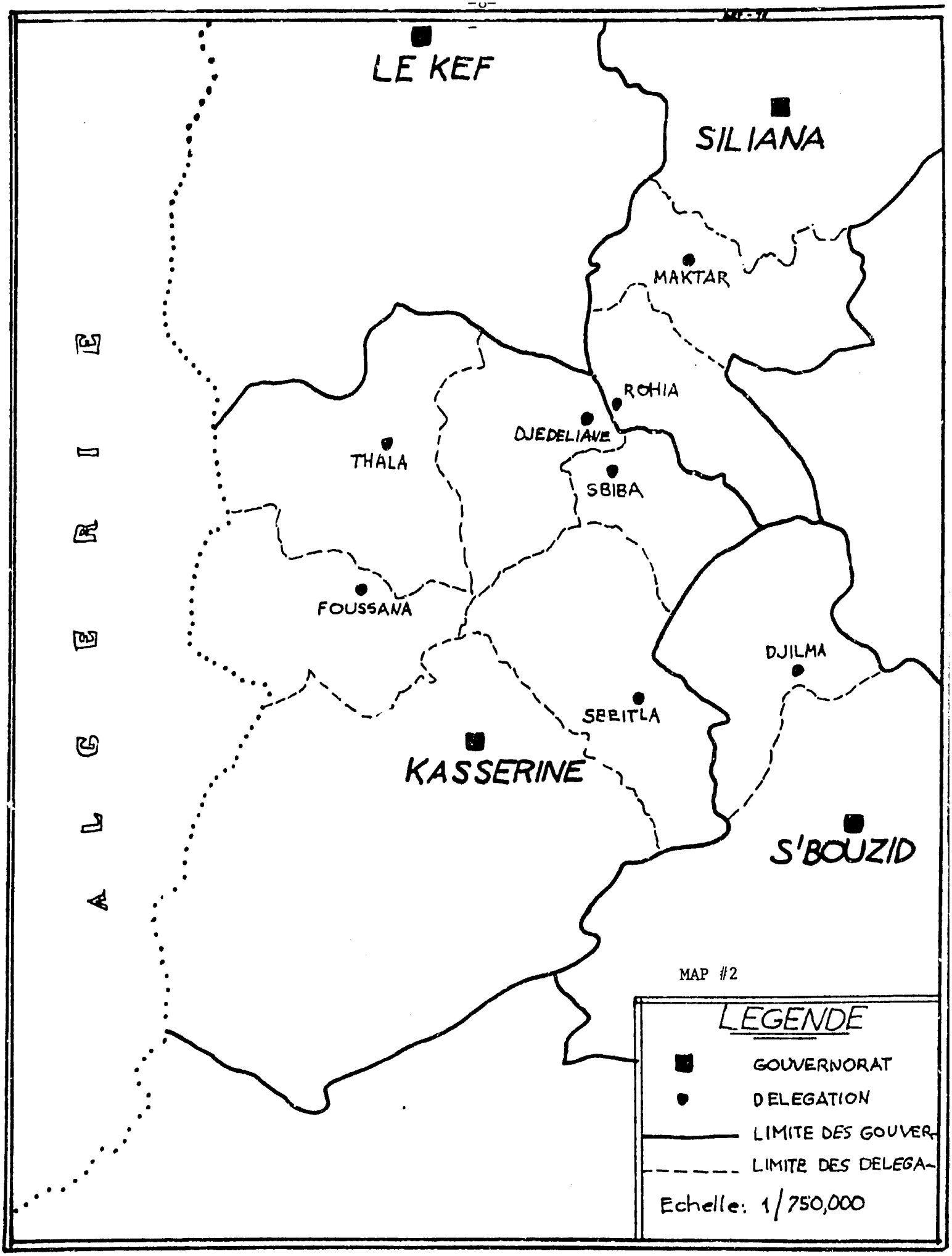
B. The Region

The total surface area of the AID Target Area in Central Tunisia is 673,750 hectares. This surface, extending over most of the Gouvernorat of Kasserine, a part of Siliana, and a part of Sidi Bou Zid includes eight delegations and a total of 80 administrative sectors (see Maps 1 and 2 on following pages). The delegations in Kasserine form the largest area and the single delegation of Djilma, in Sidi Bou Zid, the smallest. The surface of each of these delegations is as follows:

GOUVERNORAT	DELEGATION	SURFACE IN HA.
Kasserine	Thala	122,900
	Foussana	83,500
	Sbiba	45,000
	Djedliane	72,700
	Sbeitla	110,200
Siliana	Makthar	82,400
	Rohia	62,600
Sidi Bou Zid	Djilma	94,400



MAP #1
T U N I S I E
organisation administrative


LE KEF
SILIANA
MAKTAR
ROHIA
DJEDELIANE
THALA
SBIBA
FOUSSANA
DJILMA
SBEITLA
KASSERINE
S'BOUZID
ALGERIE
MAP #2
LEGENDE
GOUVERNORAT
DELEGATION
LIMITE DES GOUVER-
LIMITE DES DELEGA-
Echelle: 1/750,000

The region covered in these delegations has a varied topography and agricultural potential. The Harmajna and Haidra plains north of Thala are prime agricultural lands (dry land cereal). The area of Ain Jedour and Tioucha in Djedliane by contrast, is forested and hilly. Makthar and Rohia offer altitude contrasts and have important oueds and basins. They are important for cereal production and livestock maintenance. Foussana in its northern area is similarly important while its southern area is more desertic. Finally the steppic environment prevails around Sbeitla and Djilma.

C. Demographic Characteristics

The population of this area is 227,983 distributed over 41,448 households (Population Census, 1975). Of this population, 85% lives dispersed over the countryside and 15% lives either in municipalities (Thala, Sbiba, Sbeitla, Makthar and Rohia) or in small urban agglomerations (villages). But the distribution of population shows a wide range of variation in the eight delegations. The delegation of Makthar for example, has a total of 72 villages which accounts for 29% of its population (excluding the commune of Makthar). In contrast the other six delegations in the Gouvernorat of Kasserine and Sidi Bou Zid have a total of 52 small villages which only comprise 4.26% of the population of these delegations.

The size of the agglomerations also varies, ranging from 2,104 in the village of La Kesra to only 34 people in the village of Naima (delegation of Makthar). While most communes are accessible by major roads some of the smaller agglomerations are isolated and in some cases cannot be located on existing maps. Table I summarizes the population distribution of the entire project area.

POPULATION PROFILE OF CENTRAL TUNISIAN AREA (1)

Table 1

Delegations	# sectors	Population	Pop.Agglom.(a)	% agglom.	Pop.Dispersed	% disp.	Villages	Communes
Makthar	12	40,385	18,056	44	22,329	55	72	1
Rohia	6	17,040	4,564	26	12,476	73	21	1
Foussana	9	25,099	1,939	7	23,160	93	11	0
Thala	16	41,852	11,277	26	30,575	73	4	1
Djedliane	10	21,847	621	3	21,226	97	2	0
Sbiba	7	22,017	2,350	10	19,667	89	4	1
Sbeitla	11	38,049	8,159	21	29,890	78	1	1
Djilma	9	28,875	1,930	6	26,945	93	10	0

(1) Population figure used is that given in 1975 census for resident population
(a) Includes the communal population

The average household is composed of 5.5 people and the total number of households is given at 44,000. Of this population 48% is under age 15. The census figures reveal a larger number of dwellings than households. This is due in part to the government sponsored campaign to construct popular lodgings and in some areas to abandonment of dwellings by families leaving the area. These new government sponsored lodgings however, are concentrated along the main roads and rarely touch the more remote rural areas where the more traditional types of dwellings survive.

The data available on lodgings reveals that most homes in the project zone remain rudimentary. 58% of the lodgings in rural areas have only one room and 86% less than two (one room plus a gourbi). Only 20% of the homes have a kitchen and 15% only have a separate bathroom. Electricity is limited to 8% of the total number of lodgings in the project zone. In addition, access to some form of piped potable water is largely limited to the agglomerated areas. In Siliana, for example, 69% of the households have no access to either piped water or public fountains. It is worse in Sidi Bou Zid where 83% of the households have no water or immediate access to a public fountain. Kasserine is only sightly better since only 71% of the households have no immediate access to water. This means that for a substantial portion of the population water is limited to wells (questionable water quality) built around the house, reservoirs built near the lodgings, or a trip of two to five kilometers to the nearest water source.

D. Social Organization

The social organization of the people of Central Tunisia remains kinship-based. There are names, such as Majeur, or Freshish, or Zlass, that remain on the maps and even in the consciousness of some of the people and

identify them with ancestors or with old common land claims. But the functional importance of some of these so-called confederations, is today practically non-existent. It is more relevant to consider the continuing existence and creation of collectivities (a legal entity established to legitimize land claims) since these are representative of groups of people living in the area today and exploiting large tracts of land. We have only partial data on the collectivities in the project area. In Foussana three collectivities exist today: Bnaana, Mraouna and Baasa. In Thala we know of only two: Uthmania and Bou Ali. The Hababsa monograph outlines only one. We have no adequate information on collectivities in the gouvernorat of Siliana and the delegation of Djilma in Sidi Bou Zid.

At a more practical level we can state that the family remains the most important unit of agricultural production. Extended families (composed of a couple and their married sons and unmarried daughters) continue to predominate in the area. Links with other families, most often also kinfolk, are established through intermarriage. Proximity to kin establishes forms of mutual aid in activities ranging from agricultural production to house building and recruitment of laborers for employment in those areas and times when labor needs exist. It is important to stress the dynamic aspect of the domestic cycle as part of an adaptation to the resources available in the area. The labor capacity and needs of a nuclear family are not the same as those of an extended family with many sons. As in other parts of Tunisia where resources are limited, often the sons move out and become wage earners to supplement the family's needs and agricultural revenues. This "excess" labor available to a family can be seasonally employed elsewhere, or may migrate definitely out of the region. But in a family where such wage earners exist, the potential

for change, either through intensification of agriculture or through new investments made possible with cash incomes, is much greater than for those families which lack this option. It was hoped that during the course of our mission this dynamic aspect, and the strategies associated with the different stages of the domestic cycle, could be better explored. We know, from data available for other areas of Tunisia that this becomes crucial in determining the future economic potential of families. Data available for migration and cash wages in the project zone are insufficient to yield a picture of the importance of such labor for families in the eight delegations. Diagrams I and II illustrate the operation of the agricultural cycle and family based relations of production in general. It remains to be seen what the significance of this model is for the Central Tunisia region.

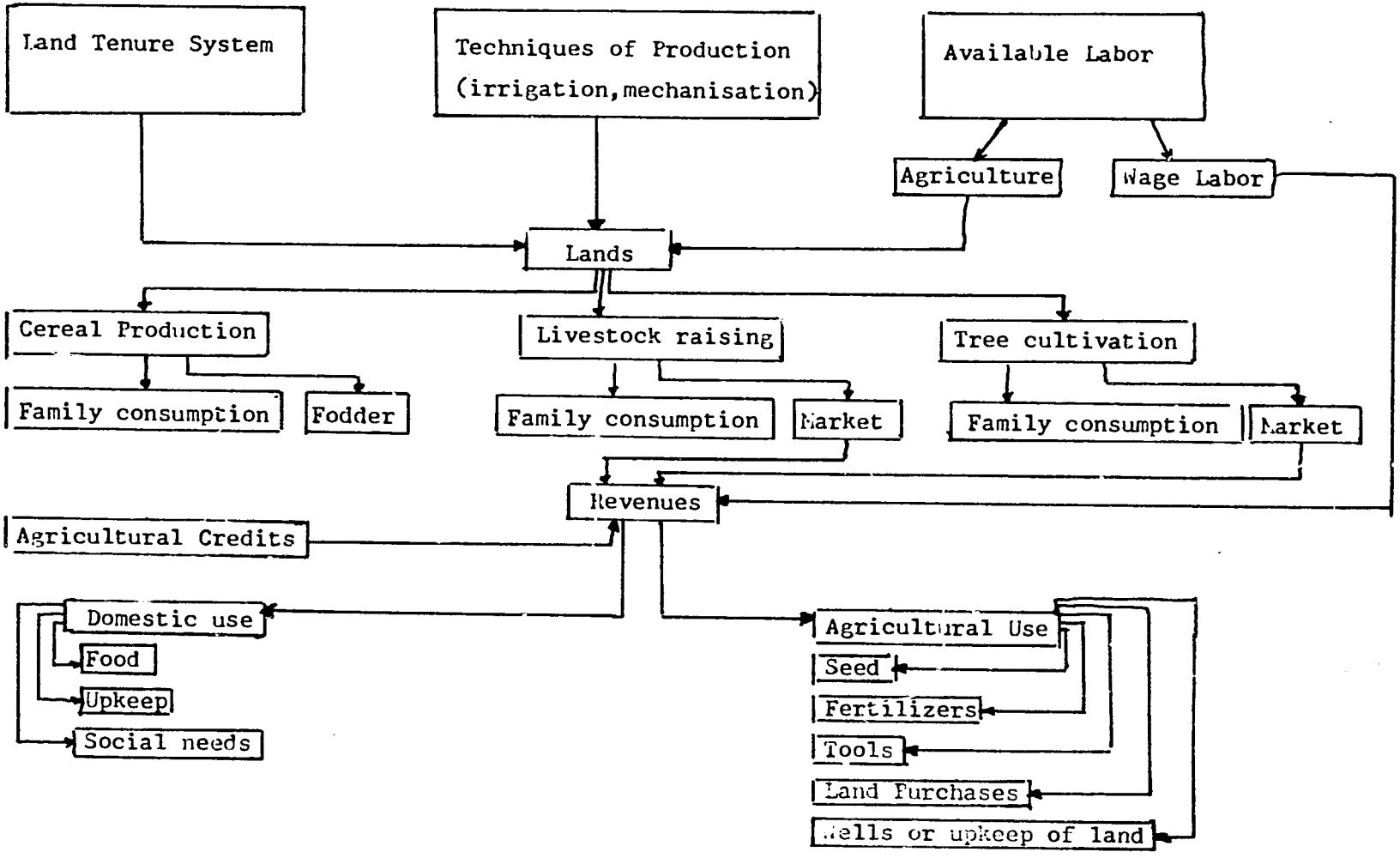
E. Land Tenure

The land tenure system is linked to the social organization of the people in Tunisia as well as to their history. It is thus artificial to separate the aspects of social organization, land tenure and economic base. While the collectivities and families have been mentioned as units in land exploitation and agricultural production it is necessary to say more about the economic base of the people and their utilization of land before attempting a synthesis of what is observable in the area today.

The Central Tunisian area has traditionally been one where nomadism prevailed. Previous to colonial implantation the plains were used for range lands and agriculture combined. As in other parts of Tunisia the French colonial period began a process of sedentarization with a concomitant change in social and economic structures. The results of this economic change were a progressive impoverishment of the people with a

DIAGRAM 1

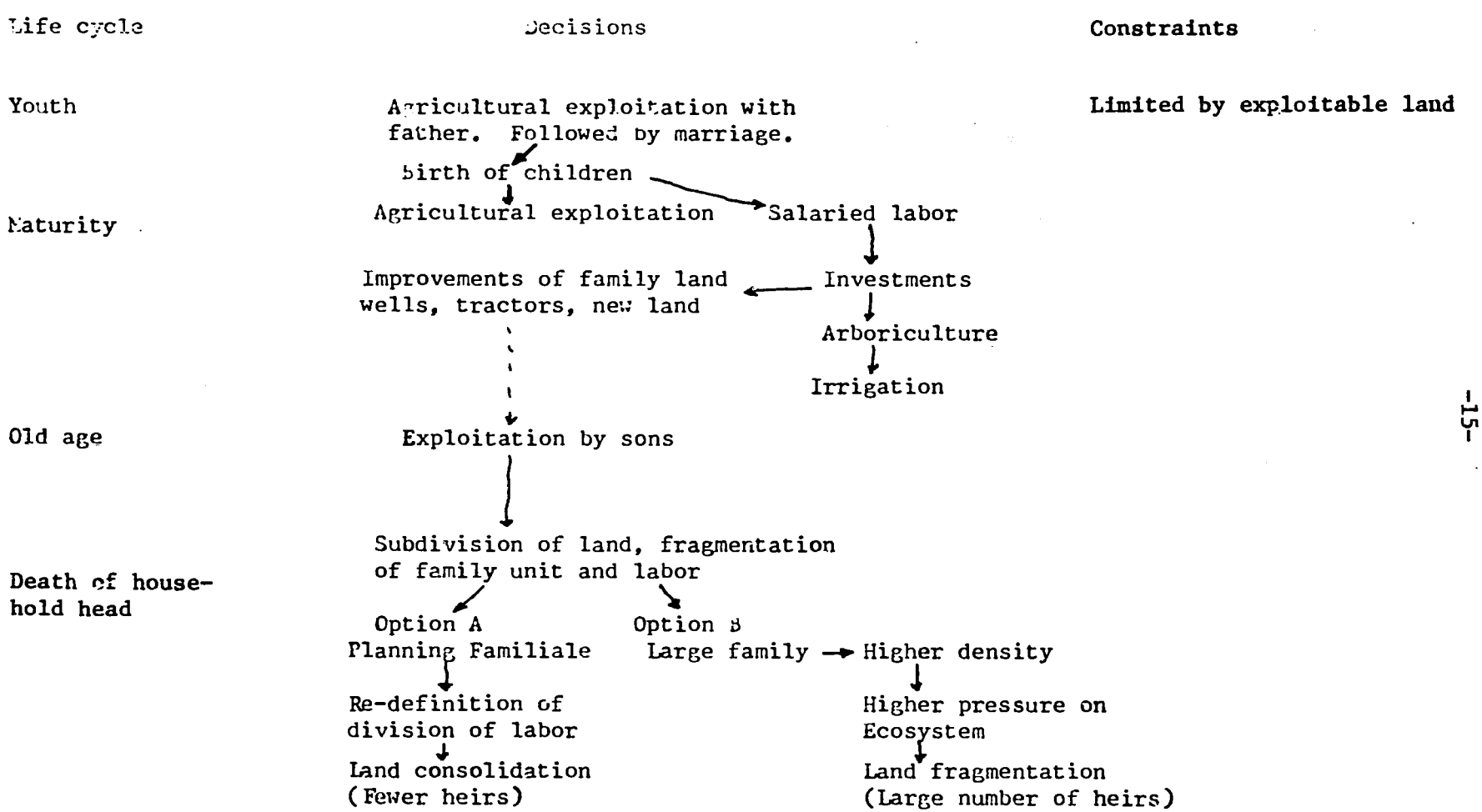
RELATIONS OF PRODUCTION



(Southall and Lee)

DIAGRAM 2

FAMILY CYCLE MODEL



(Southall and Lee)

loss of their lands and mobility, and the introduction of new economic alternatives.

The old economic base, mixed agriculture with livestock raising, continues today for most of the rural population. But land fragmentation has resulted in a progressive diminution of the plots of land held by individual families. This fragmentation is a direct result of sedentarization and a trend for privatization of land which is a new phenomenon in the country.

Traditional systems of land tenure divided the land into areas that were communally exploited by people with common kinship links. These groups of people (clans) held claims to areas of lands based on their continuous use of it. Other lands were held in religious trusteeships (Habous) or belonged to religious brotherhoods. Privately held land was limited to a small percentage of the exploitable area or held by the state. This meant that the people as a whole had access and use of lands to fit their needs. In those areas where agriculture was pursued, plots of land were allocated to families and often the plot became associated with a single family after years of habitual use. But there were few actual property titles and customary right prevailed. The areas of lands used by various kin groups were known to their neighbors. In the case of a conflict, land could be gotten through "razzias" on neighbors, which consisted of appropriating animals and women until eventually the stronger group gained new territory or the intruder was forced to old boundaries. With a change in mobility and a French desire to regulate land and fix people on it, the economic base began to change and with it the basic units of production. A large agnatic group decreased in importance and smaller family groups

became more important. Livestock decreased in importance and cereal and arboriculture increased.

Legal provisions early in this century established the legal entity known as the "collectivity" to legitimize land claims and guarantee continued rights of usufruct though not de jure ownership of the land. This legislation (1918) also provided for the creation of an advisory council from among the members of the collectivity to insure that any land transaction was legitimate and fair. The same legislation allowed however, for a plot of land to be considered as private land if it had been utilized and made productive by the same individual for a period of over five years. Thereafter this "owner" could freely sell the land.

In the Central Tunisian area the collective lands are only a fraction of the total surface. Large amounts of land are utilized but are in an undefined or irregular legal state designated as "Terres Collectives d'Extrème Indivision". In these lands, before any titles can be issued the "collectivity" must be created. Thus in effect, calling into legal existence an entity composed of people who may in reality be unrelated but accidentally living in the same area of land. When this civil person - the collectivity - and its elected council (Conseil de Gestion) are created, the lands pass into the category of collective lands and an inventory and auditing of lands is begun which culminates in the issuance of titles to individual plots of land. The consequence of this privatization is more sedentarization and with it a different use of land. In most cases, since privatization leads to access to agricultural credit, it has led to greater emphasis on arboriculture. But regardless of whether the land is communal or private the people living on it and exploiting it must make constant adjustments and subdivisions. In the case of private

land this continuing partition among the heirs leads to fragmentation of land. This becomes of great significance in the case of irrigated lands.

The traditional (kuranic) patterns of inheritance divide the different sorts of land among all heirs to insure an equitable distribution of resources among the members of one family. Thus for instance, a man having range lands, irrigated lands, and dry agricultural lands, will divide each of them into lots and give portions of each type of land to his heirs. But since the irrigated land tends to be only a small portion of the total land holdings and the most sought after, this would make these parcels of land very small and eventually economically unviable unless the heirs of one man combined their resources and continued to exploit them together at the death of the father. This problem of traditional structures of inheritance and plots of irrigated land has been brought out by Hopkins as an example where social organization and traditional inheritance patterns must be re-adjusted or new alternatives sought before the already small plots on irrigated perimeters become subdivided and useless. Diagram III is a synopsis of the various classifications of lands since the Pre-Colonial period and the transformations these lands have experienced to date.

Data on land tenure for the project zone indicates the distribution of collective, private and "terres d'extrème indivision" as follows:

Collective lands	102,000Ha
Terres d'Extrème Indiv.	163,000Ha
Private (titled)	13,100Ha
Cultivated Domanial	21,700Ha
State Domanial (forested)	112,700Ha
Uncultivable	16,500Ha

(Rapport Général, p. 25, vol I)

DIAGRAM III

LAND CLASSIFICATION

LEGAL REFERENT		TIME PERIOD
ISLAMIC LAW	Dead lands → Living lands; Public lands; Melk (private); Habous: Private, Public, Mixed	Pre-1881
Law 1881 Law of 1895, 96 Law of 1901 (land Commission)	DOMANIAL LANDS: Public, Private; COLLECTIVE LANDS; optional land registration	1881-1956
Law of 1918, 1935, 1957, 1964, 1971	DOMANIAL LANDS: Enzel or Kirdar leases (create real property rights); Abolition of Habous: Private lands registry Required	1956 - date
	Redistribution and intitulation of collective lands. "Group" administration, supervision. Elected Management Councils: Use, dispose and enjoy property	
	TERRES D'EXTREME INDIVISION	
	COLLECTIVE LANDS	

The surface given in the source cited above is lower than that in the publication of the Projet de développement rural intégré. This discrepancy must be noted since the estimates given in the former report will be consistently lower than those figures collected by the various officials of the Service Foncière of the CRDA (Commissariat Régional de Développement Agricole).

Since we have no information on the various surveying techniques used by each of these reports one can assume that the information gathered by the local CRDA in each gouvernorat may be more reliable since it reflects actual surfaces the agents are dealing with for land titulation and cadastral surveys. The CRDA however, can offer only approximations unless they have done the cadastral surveys. While aerial photographs exist for most of the country which could give more precise information about the surfaces in each gouvernorat, the data is most often compiled and calculated from existing maps drafted during the Protectorate period. Given these strictures this report includes land surfaces calculated and transmitted to us by the Service Foncière unless otherwise indicated. The overall surface for each delegation has been given so it need not be repeated here. The various types of lands we obtained information for are the following:

	Kasserine	Siliana*	Sidi Bou Zid
Total surface in Ha.	654,700	145,000	740,000
Collective lands	156,000		316,000
Domanial lands	700		46,000
Terres d'Extrème Indiv.	262,000		117,000
Ex Habous	6,000		63,000
Certified lands (old titles and contracts)	30,000		40,977

(Information from CRDA Kasserine and Sidi Bou Zid)

*We lack at this time similar statistics from the Gouvernorat of Siliana.

Collective lands under the tutelage of the Conseil de Gestion may be de facto considered as private lands by the individuals who have traditionally made use of them. Even the pasture areas in collective lands are tacitly recognized as being private. The legal provisions for subdivision of collective lands gives rise to legal titles though these are in principle not supposed to give absolute right of ownership to a plot of land. De facto, the individuals exploiting the land and rendering it productive for a period of at least seven years enjoy rights of ownership. This is seen as a mechanism to render the land productive by giving individuals access to official credits. In other lands, the only legal title that gives uncontested rights of ownership is a "blue title", and these exist primarily for lands which have been surveyed and inventoried by the offices involved in land reform.

The status of the "terres collectives d'extrême indivision" is the most difficult since these are lands that have been traditionally used by the people but where only customary right or old "Arab titles" legalized the occupation of the land. In order for these lands to be regularized the state requires that they be classified as "collective lands" before any auditing and surveying of land can take place.

This information was given to us by M. Smati (Affaires Fonciers - Kasserine) and stems from the legal situation which provides for the "collectivity" as a whole to be responsible and representative (personne morale) when dealing with land affairs. By creating this collectivity, then, the government can direct its unified efforts to a single entity rather than having to deal with individual requests and audits in those lands which are traditionally exploited collectively. (Application of Title III, law of 1971.)

The former habous lands have been given to the designated heirs and occupants of the land in the case of private habous. Most formerly public habous have been transformed into state domanial lands subject to re-distribution to the people of the region by the authorities.

F. General Economic Base

The agricultural profile of the region shows a general over-utilization of the land currently exploited. In the two zones (Northern Zone I and Southern Zone II) covered by the Rapport Général the potential and actual utilization shows the following:

POTENTIAL UTILIZATION		UTILIZATION NOW	
Dry land cereal and irrigated	27.300	dry land agriculture	9.700
Annual cultures	21.100	irrigated cultures	2.000
		cereals	59.100
Pastures		Pastures	
good pasture land	64.600	fallow and overgrown	58.600
medium quality pastures	15.400	alfa pastures	10.100
		shrub pastures	15.300
Lands to be protected	97.800	domanial forests	60.400
		non-agricultural	11.000

Source Rapport Général, p. 11.

The main crops in the dry land farming areas are wheat and barley, some oats, olives, almonds, fruit trees, cactus and spineless cactus. Livestock production is also significant.

The Rapport Général indicates that 90% of the population is dependent on agriculture. Livestock estimates for the area are given in the same report at 1,000,000 head (sheep and goats predominate followed by camels and cattle). This figure must be taken as a rough approximation given

periodic fluctuations due to precipitation, fodder reserves, and government subsidies (food supplements for animals). Very few families in the project zone can afford to keep large flocks of animals. The average flock size, based on personal knowledge and limited reconnaissance ranges from 10-40 animals.

The data on land tenure reveals that the largest proportion of farmers in the project area have under 20Ha and occupy about half the agricultural land in the region.

Size of exploitations	Zone I	Zone II
under 5Ha	35% - 10% SAU	12% - 2% SAU *
5-20Ha	52% - 45%	60% - 40%
20-50Ha	10% - 23%	25% - 40%
over 50Ha	3% - 22%	3% - 18%

(* Utilizable agricultural surface)

Zone I - Northern area of target zone

Zone II - Southern area of target zone

The combination of cereals, tree cultivation and livestock production predominates in the northern project zone. The Rapport Général indicates that most of these lands have at least 50% of their surfaces in continuous agricultural production (no fallow) and tree plantings are limited to young trees. The southern project zone in contrast shows more feeble agricultural yields and older tree orchards. In this zone there is also a greater concentration of capital intensive agriculture with more extensive use of mechanical equipment and wage labor.

The strongest contrast exists between the dry land agricultural areas and those surfaces where irrigation has been implemented. In those

areas where state intervention has resulted in the creation of new irrigated lands, the available land has been divided into 4Ha plots. The people inhabiting the area have first rights over the plots and where land was expropriated for perimeter use the landowners were paid 20D/Ha for it.

The problems associated with the exploitation of these irrigated lands revolve, as has been indicated, around the issues of further land partitioning. At the administrative level problems of communication arise between the farmers and the officials. Water allocation, lack of technical advisory expertise and supplies available are constant complaints. Hopkins indicates in his report that a mutual distrust exists, each side blaming the other for poor relations and tensions. Part of this problem is related to credit availability and distribution and misuse of credit by farmers and politicians. Stopping the flow of credit where loans have not been repaid is no solution since it precludes on a permanent basis further prospects for liquidation of debts by the farmers.

These general issues point to an overall lack of sociological understanding on the part of the officials who seemingly have neglected a thorough examination of the operation of family labor utilization, resources and goals. The study of adaptive strategies, risk minimization and decision-making by the farmers in the project zone is of more than theoretical interest. Castelli points out that the people seem to be more interested in maintaining a certain quality of life than in money. He stresses their preference for simple technology, family organization of labor and a subsistence approach. Hopkins indicates that even as people find themselves increasingly tied to a money economy they are still not used

to calculating in monetary terms. He indicates: "the absence of any conception of income and profit shows eloquently how forms of production change more quickly than the personality of the people."

This is more than simple anthropological opinion. It is substantiated by studies where allocation of resources show traditional forms of social organization aimed at minimizing risks by optimizing labor and yet keeping culturally valued ties active.

The threshold of land tenancy viability for a household is calculated at 25Ha, with operations of 40Ha establishing an adequate survival margin based on the calculation of the Rapport Général and the Hababsa Survey. But given the figures for land tenure available we can generalize and say that over 50% of the population involved in agriculture has less than the minimum amount of land to insure subsistence. In Hababsa, for instance 60% have less than 40Ha and only 19% have over 40Ha. The collectivity of Bnana in the delegation of Foussana has only 5% of the farmers with an adequate amount of land while 95% have less than the minimum amount of 40Ha after collective lands have been divided and distributed. In Thala approximately 200 farmers have over 30Ha while 7,000 have under this amount to exploit. This means that most of the population in the project zone is considerably under the national average income for rural families (TD 603). The entire area depends on their agricultural production for subsistence (self-consumption). For those farmers having less than 5Ha of exploitable land, even optimum years with good agriculture yields are insufficient to insure survival.

A comparison of agricultural revenues gathered in the Rapport Général, which must be taken as approximations and somewhat out of date indicate

that a 14Ha plot produces the equivalent of 200 Dinars a year giving an average per capita income of 40 Dinars. The Hababsa survey, more up to date and based on more carefully conducted surveys puts agricultural revenues as follows:

Farmers with less than 10Ha	TD 23	annual per capita income
10 - 25Ha	TD 84	" " " "
25 - 40Ha	TD 108	" " " "
over 40Ha	TD 304	" " " "

The per capita income for the whole Hababsa region is 18D in addition to agricultural production. This does not take into account the depletion of any potential surpluses that could be accumulated and which must be used in bad agricultural years.

Given the structure of agricultural revenues, the families must rely on extra-agricultural sources of income. The Rapport Général indicates that for Zone I these revenues amount to TD 230 a year, by far more significant than agricultural income. For Zone II the extra-agricultural revenue is estimated to TD 140 a year. These cash wages are more vital to the small producer than they are to the families with more resources and flexibility. But even with these extra sources of revenue the area as a whole is considerably under the national average. 30% of the people in the gouvernorat of Kasserine and 22% in Sidi Bou Zid have an annual per capita income of less than TD 50 contrasted to 16% for the rest of Tunisia.

Given these conditions, the extra-agricultural sources for revenue become an essential part of the survival strategy. Hopkins indicates that

these revenues are utilized to supplement agricultural income, produce a small capital reserve, or in a few cases, acquire land or technical inputs for agriculture. Hopkins sees migrant labor as the most essential component in pushing families into a better off economic category with a combined pool of family members. This means in effect a continuation of traditional forms of social structure where the males in one family pool agricultural revenues and cash resources under the direction of a pater familias. This form of organization constitutes an optimum support system that is activated differently at various periods during the year and in periods of economic hardship.

Agricultural intensification and more efficient exploitation of land is a partial solution to the problems in the region, and some which must be placed in the context of the total resources of the ecosystem of the Central Tunisian region. In this respect the efficient operation of extension agents and their integration into the CTDA is essential and must be analyzed and operationalized in the context of Tunisian bureaucratic institutions. The Rapport Général indicates a need for more emphasis on decentralized control. Hopkins, Castelli and Attia indicate a need for increased participation at the local levels and an increased awareness on the part of the people of their role in improving their living conditions.

What is evident in Tunisia today is a series of economic plans and development programs created by the centralized ministries and agencies involved in development efforts which are characterized by a single-component causal chain. Problems are not dealt with in an integrated and systemic fashion. Moreover careful analysis of the various projects does

not show an analytic framework which stresses long term benefits but rather one which justifies short term expenditures. This is most obvious in the cases of "demonstration" projects in the project zone where a myriad of small projects are outlined and their expenses justified, but which in the end do little for the region as a whole and benefit only a very small portion of the population.

These projects in most cases form the basis for activating the mechanism of land reform. Thus, in Foussana, new collectivities are to be formed in what are today Terres d'Extrême Indivision because the government has designated some of these lands for irrigated perimeters. This is not to denigrate or minimize the need for such interventions, but rather to indicate the ad-hoc problem designation and solution which reflects a centralized planning and control mechanism rather than a community defined and generated set of solutions to pressing needs that would eventually be better accepted with less social conflict. This point is made in the Hababsa survey as well, indicating that the institutions that exist today are in need of more dynamism and representativeness. The study points to the need for establishing new institutions based on consensus rather than on centralized power - institutions that would reflect the participation of all people in the region rather than a few privileged farmers and that would benefit the most underprivileged.

G. Data Gaps

The information that has been compiled in this report gives an overall understanding of the characteristics of social organization, land tenure and economy of the people in the central region. While we have a general grasp of the operation of the main factors and constraints associated

with production and subsistence in the area, specific details as to the operation of the following would lend more depth and a better understanding of the society and economy in this area:

1. Information of the location and resources of specific small villages indicated in the census.
2. Distribution and utilization of land surrounding small villages and larger urban agglomerations.
3. Utilization of migrant labor in relation to existing small industry, commercial establishments, and service opportunities in the area. (Data for commercial establishments is only aggregated at the delegation level and we have no information about the manner in which supplies are obtained by the more isolated segments of the rural population and the micro-systems of credit which exist at the village levels.)
4. Specific information about local entrepreneurs and their spheres of influence. This is of importance to villages as far as providing local sources of employment and for establishing wider networks outside the villages.
5. Specific information and policy statements regarding construction of public housing, their mode of "allocation" to members of local communities and the response of the people to these campaigns, their impact and effectiveness remains - to the casual observer - to be less than positive. This aspect of public housing remains an item of further in-depth exploration because of its important social and economic potential.
6. Information about the education and preparation of extension agents and their mode of operation in rural areas: timing of

extension services, nature of information disseminated, context of information campaigns, feedback between farmers and extension agents. This item includes CRDA officials associated with Production Animale et Vegétale as well as members of the Service Foncière and the Service de Prets. This information would fill important gaps in the data base regarding the possibility of institutionalizing new agricultural practices, commercialization and provisioning of agricultural products, and a better understanding of the processes of land intitulation and accessibility of the people to credit structures as well as an understanding of the limitations of the systems of credit currently available.

The gaps of information outlined here could be filled more or less easily with a continued period of access to information in the field. While some of the existing reports give some detail about the points above, there is a lack of emphasis of the dynamics of innovation and institutionalization of change. The items listed here will be vital to later stages in the planning process.

III. THE NATURAL RESOURCE MANAGEMENT RECONNAISSANCE

A. Introduction

This section represents a summary of the findings of the Natural Resources Management Reconnaissance whose objectives were as follows:

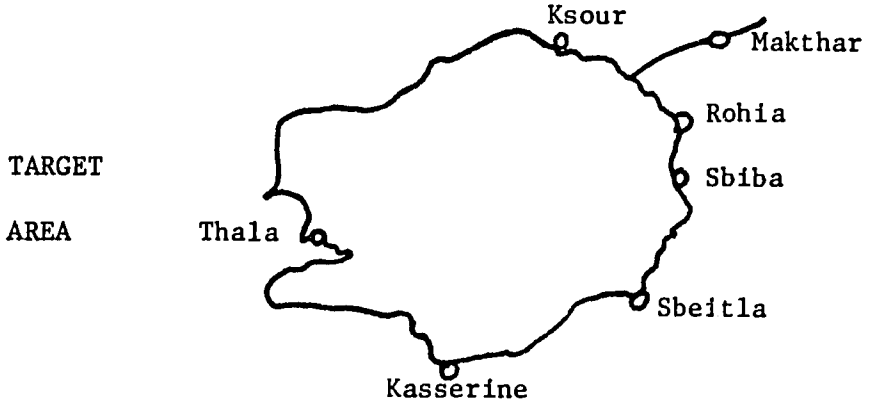
1. To assess existing practices and problems in soil and water resources management along with the nature and effectiveness of past interventions.

2. To assess the soil and water resources information base for use in planning.
3. To assess the existing technical capacity to support ODTC efforts in regional planning.

This evaluation is based on interviews, a reconnaissance tour of the region, document analysis and personal impressions.

B. Water and Soil Resources Management-Practices and Problems

Field observations of the water and soil resource situation were made on one-day tours of the eight-delegation AID target area and the 22-delegation ODTC region as well as follow-up visits to some areas. The maps below show the route taken and points that were of interest to the resources team.



overgrazing linked to erosion

cactus cultivation for animal feed

vertical plowing on hillsides

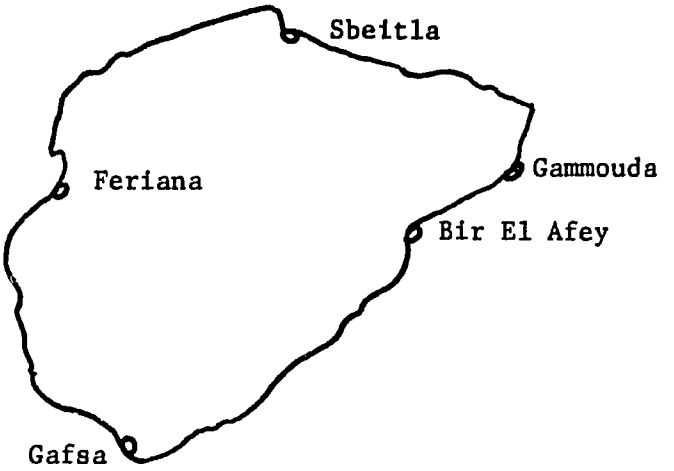
oil production SW of Sbiba

irrigated perimeter of Sbiba

iron and phosphate production on NW border of region

shallow well irrigation at Foussana

OPERATIONAL AREA



hand harvesting alfa crop

tree crops in irrigated perimeter at Gammouda

dryland farming methods

Sfax water supply pipelines

ODTC office at Sbeitla

In general, land and water management practices are poor throughout Central Tunisia. There is substantial room for improvement in both large-scale resource management programs and on-farm resource use. Although our assessment of the natural resource base and of current management practices is based on a brief reconnaissance, we feel that the types of observations made below lead to a reasonable and valid representation of the resource management situation of Central Tunisia.

In the area of soil conservation, reforestation has been attempted on some eroded slopes, but often without terracing to aid the process. Overgrazing and subsequent wind erosion continue to be a widespread problem. There are many remedies which could help to prevent and repair erosion damage if properly used.

Many farmers continue to plow vertically on hillsides, encouraging runoff and erosion. Crop spacing, especially of tree crops, varied widely throughout the region. Optimum crop spacing could have significant effects on production. Increased agricultural production could be achieved along with natural resource conservation through some simple changes in agricultural practices.

Our visit to a farm in Foussana irrigated by a shallow well revealed a lack of on-farm water management which could be readily improved by extension. The farmer stated that he pumped water six hours every other day. This high rate of water use may be dangerous as well as wasteful in view of the salinity situation in the area. Some wells have salinities as high as 1.9 grams/liter (1990 parts per million) with many in the range of 0.4 to 1.1 g/l.

Water of this quality could reduce yields of salt-sensitive plants and, if irrigation is not managed properly, could result in an accumulation of salts in the root zone sufficient to harm even salt tolerant plants. Salt accumulation may take several years to show up but would be disastrous for the farmers involved.

Weed control is an example of a simple practice which seems to be ignored. Poor weed control may have contributed to the unusually high water use on the farm near Foussana. Weed control was poor even in the irrigated perimeter at Sbiba where extension efforts are intensive.

C. Institutional Capacity for Resource Management and Planning

The natural resources team gained impressions of the institutional capacity and character from visits with officials of the following agencies:

National

Office d'Elevage et Paturage
Directorate des Forets
Bureau du Plan, Ministere d'Agriculture
Division des Sols, Direction des Ressources en Eau et du Sol
Centre National d'Etudes Agricoles
Direction de l'Enseignement de la Recherche et de la Vulgarisation

Regional

Commissariat Regionale du Developpement Agricole
Division des Ressoureces en Eau et du Sol
Office du Developpement de la Tunisie Centrale
Office d'Elevage et Paturage

Much of the existing resource management capability is housed with the Ministry of Agriculture.

Good project management capability exists in the Office d'Elevage et Paturage (OEP) and we were impressed by overall project plans. OEP

appears ready to expand some of its programs into Central Tunisia. Expertise was not apparent at the regional level and the extension personnel in the regional office seemed unsure of technical information. They also mentioned a problem of understaffing. AID advisors to this project confirmed our impressions but added that reorganization was underway.

The Centre Nationale d'Etudes Agricoles (CNEA) appears to possess good technical capacity. Of the 60 staff members, 30 are professionals in disciplines related to the development of rural agriculture, particularly economics. CNEA has offered personnel as well as training programs for ODTC. A small computer (HP8945) is housed in the Centre's offices.

The Bureau du Plan in the Ministry of Agriculture has done extensive survey research throughout Tunisia, but data is available only on the national level. This agency proposes the capital budget for the Ministry of Agriculture. It is currently tracking the progress of the ODTC with an interest in promoting further assistance.

The Commissariat Régional du Developpement Agricole is the regional coordinator for all Ministry of Agriculture services. The Commissariat has 90 technical staff members for the gouvernorats of Kasserine and Sidi Bou Zid, with an engineer from at least some of its divisions in each delegation. In addition to a strong technical base, the CRDA has close ties with the gouvernorat commissions as well as with the governor's office.

The Direction des Ressources en Eau et du Sol (DRES) has separate soil and water divisions. The Division des Sols exists only at the national

level. Aside from the problems of reproduction and availability of maps, the technical base for soil information seemed sound. We were highly impressed with DRES at the regional level. The levels of training and competency of the staff seemed particularly high. The working conditions reflected efficiency. Strong technical competence was evident from the completeness of the monitoring system, the basic investigation program and the project approval system.

The Direction de l'Enseignement, de la Recherche, et de la Vulgarisation was created in a recent reorganization. Its programs are new and its responsibilities diverse so that a visit with the Assistant Director yielded little actual information on the workings of the institution. The working conditions and the written documents reflected a high degree of organization and innovation for a new agency.

Overall, the programs and personnel of the agencies appear sufficient to provide most of the resource management information and expertise needed for a planning effort. The adequacy of the staffs of all agencies for increased project loads could not be determined, but strain seems likely in some cases. Inadequate staff might be a potential source of difficulty which the ODTC must consider in its role as project manager.

Although we were not able to visit the offices of the Société Nationale (SONEDE) or the Genie Rural (office within the CRDA), these agencies appear to have valuable technical capabilities. Future missions should include visits to these offices.

The institution of greatest concern, the ODTC, is a new organization with limited staff. Its technical capabilities are also limited. In building an effective resources planning program, attention must be given to two areas of capability. First, a regional planning agency must have the technical staff to gather and assess resource data. An understanding of the process of inventorying natural resources is needed. The technicians must be able to integrate resource data for use in planning. Secondly, staff members must be thoroughly acquainted with and able to use the relationships among the line agencies and between those agencies and the ODTC.

The first and principal step in building this capacity is skillful staffing. Technical resource specialists must have administrative and coordinative skills as well as substantive knowledge. The specialists have four important job functions:

1. Project management for the existing contracts.
2. Collection and assessment of technical information and related long-range resource planning activities.
3. Coordination
4. Performance of special studies.

Since the first major AID supported interventions, the dryland farming and small holder irrigation, will be related to natural resources, at least two specialists should be added immediately in water management, agriculture and extension. We cannot overstate the importance of high quality personnel to the ultimate success of the planning program. One of our greatest concerns is the prospect for a successful recruitment for these positions.

D. Information and Data Base

Time did not permit us to examine the full array of data necessary. It appears that sufficient information exists for initiating a natural resources inventory as a basis for planning in Central Tunisia. Although we could not closely examine the data collection and management procedures, the natural resources data base appears well established. Soils, surface and ground water, topography, climate and vegetation are well mapped and monitored. For example, the water-resource related information for the Central Tunisia region available from DRES (and displayed on 1/50,000 topographic maps, and larger scales where appropriate for particular studies) include:

1. Climatic data.
2. Surface water quantity and quality data.
3. Ground water quantity and quality maps and data for both shallow and deep aquifer systems, as well as springs.
4. Water-resource studies of individual basins in the region.
5. Special technical studies with regard to development activities.
6. An ongoing water resource monitoring program.
7. Information regarding the location of all wells, springs, etc. within the region; this information base is kept current through a regulatory process for new wells.
8. An accessible computer modeling capability which permits testing the hydrologic impacts of various water development proposals, e.g., a proposed high-capacity well.

Special studies and historical trend information are maintained by the DRES

office in Tunis.

Soil survey information also exists but is less accessible. A yearly Bulletin des Sols is published with a map on a scale of 1:500,000. Maps exist at working scales (1:20,000 and 1:50,000) but must be used at the Division of Soils offices in Tunis . Copies of air photos are available upon request. Data on the physical properties of soils may be very limited. Again, this is a first impression and validation of the exact quality of data would require close examination of the data collection and processing activities. ORSTOM (Office de la Recherche Scientifique et Technique d'Outre-Mer) and CRGR (Centre de la Recherche de Genie Rurale) are other known sources of specialized soil studies.

E. Research Capability

Much of the success of the ODTC activities, particularly in the early phases, will depend directly on the success of the agricultural interventions. Improved agricultural practices can only be achieved through the development of an adequate applied research capability within Tunisia. The challenge is threefold: (1) to develop, with the assistance of a sub-contracting American university, the package of tillage and management practices which will improve grain and other crop yields; (2) to train additional planning, evaluation and research personnel who will be in position to function as University of Wisconsin advisors withdraw; and (3) to train the needed extension workers so that the actual transfer of knowledge into practice will take place.

Research in the natural resources area is done by branches of the Ministry of Agriculture as well as a few independent institutions.

For those institutions under the Ministry of Agriculture, the Conseil Superieure de la Recherche chooses the major areas of inquiry which appear in the National Plan. A committee of the Direction de l'Enseignement, de la Recherche et de la Vulgarisation elaborates on the major areas to produce a national research program. Research is carried out at three research institutes and ten post-secondary agricultural institutes.

The three major research institutes are located in Tunis. Although the institutes maintain field stations throughout the country, it has been difficult to keep them staffed and the research done there has necessarily been rudimentary.

The staffing problem appears to extend to the post-secondary agricultural education institutes as well. Research programs vary widely between the institutes according to the interest and expertise of the staff. Our visit to the Institut des Grandes Cultures at Le Kef reflected these problems. This Institute is not really a research institute at present. It is true that it is conducting useful trials of barley varieties and beginning a modest breeding program. However it has essentially no laboratories, no equipment, no library, no research program and no permanent staff outside of the Director. The present barley breeding program at Le Kef functions because it requires only simple experimental plots which can be planted and harvested by hand. Fertility experiments will add a degree of complexity though much of the activity can still be carried out with simple tools. However, the necessary tillage and water management experiments, though similar to research done routinely in

many countries, will require a substantial increase in research capability.

Some simple and workable mechanism must be found for providing overall direction to the development of the Institute. This must meet the needs of the University and the government system under which it operates and also be responsive to the requirements of the Central Tunisia Development Program. Perhaps a permanent advisory board meeting at regular intervals with representatives nominated by the University of Wisconsin, other contractors, representatives of concerned Tunisian agencies, and research program leaders with an ODTC technical staff member as executive secretary might serve this purpose. At very modest cost (travel and expenses) a permanent set of U.S. advisors of the highest quality and with considerable field experience could be assembled. No matter how the planning function is organized, it is imperative that Le Kef be adequately supported, not only financially, but with the necessary scientific supervision. If Le Kef is given the lead role in soil and water management, including agronomic practices and plant breeding, and receives a steady infusion of intellectual capital from the U.S. and international agencies, the hiring and retention of high quality employees should be easier. If the facilities and intellectual climate are good, the desire to move to Tunis at the earliest opportunity should be lessened.

The long-range assistance program for Le Kef should solve some of the applied research problems of cereals culture, but we remain concerned that there appears to be no overall plan for the augmentation of applied research on a national scale.

The independent research institutes conducting resources-related research

in Tunisia are the Office de la Recherche Scientifique et Technique de l'Outre-Mer (ORSTOM) and the Centre National de la Recherche Scientifique (CNRS)-both French institutions. ORSTOM maintains an office in Tunis (38 Avenue Charles Nicolle) with a full-time director (Mr. Robert LeFevre). ORSTOM negotiates agreements with the Ministry of Agriculture for three types of research projects: long-term research done by ORSTOM personnel; long-term research done by Tunisian service personnel assisted by ORSTOM researchers; and short-term special studies done by ORSTOM personnel in conjunction with Tunisian personnel. The ORSTOM bibliographies we obtained indicate a broad scope of research with an emphasis on soil studies. The research is done wholly in Tunisian facilities. The ORSTOM office includes a library but no laboratories.

CNRS (dealing with natural resources) does not maintain an office in Tunisia. Its main offices are in Paris. Although we were not able to talk with CNRS officials or learn about their current research in Tunisia, their sizable bibliography indicates past research in soil and water resources including important basic information.

F. Agricultural Extension

The success of ODTC activities in the early stages will depend on the agricultural interventions. Improved agricultural production and conservation of natural resources in turn depend on the transfer of technology into practice. Extension must reach farmers to help them make use of new research and development efforts. Effective extension programs must in turn be linked to applied research as well as to the educational system.

Limited resources have forced the adoption of a very broad concept of extension. The importance of education is often underemphasized in the agent's attempt to carry out a myriad of other responsibilities. The extension agent is responsible for credit studies for farmers receiving loans, administration of the distribution of seed, fertilizer and equipment and the design of complete farm management plans for many of his clients. Education takes time which the agents generally do not have. At this time,therefore, it is more practical to deliver prepared plans for cultivation, planting, fertilizer application and overall management, leaving little to the farmer's discretion and adding little to his understanding.

The general extension strategy is designed to overcome a wariness of government as well as a resistance to change. The extension agents work first with the more progressive or respected community members in hopes that others will follow their lead. Demonstration plots are often located on such farmers' lands and on-farm information days are held there. On-site education is sometimes supplemented by publicity or informative materials from the Direction de l'Enseignement de la Recherche et de la Vulgarisation in Tunis. The information effort is just getting underway, providing films for loan as well as producing informative spots for the mass media.

The system of extension programs is sizable and should be workable, but some deep-rooted problems hinder its effectiveness. The older Tunisian farmers are not yet accustomed to investing in advance in order to increase production later. The people of Central Tunisia have been subsistence farmers for so long that commercialization is a difficult task. For example,

the farmers in the irrigated perimeter at Sbiba have just begun to sell their surplus milk at the local market. Selling milk is contrary to long-standing tradition, preferring to give it away.

A strong adherence to tradition causes some of the extension agents to view the small farmers as ignorant of sound farming practices or unable to understand them. Although we are not certain how widespread this attitude is, it could be a definite hindrance to the education effort. This negative attitude may be a part of the reason why the extension agents tend to deliver complete farm management packages and why many of the farmers refuse to follow them or follow them only partially. The farmers may resent the small part they play in the design of their own farm plans.

Some farmers have an equally negative view of the extension agent. A farm visit near Hassi El Fered, Kasserine gouvernorat, revealed that local people felt that extension personnel from the city who visited only occasionally could not understand their situation well enough to help them. Although the farm we visited was irrigated by a shallow well, all of the large tomato plants were wilted beyond recovery. The local officials who guided us attributed this farmer's failure to his ignorance of good farming practices. They felt that government agents were not helping the illiterate local farmers.

The extension effort is also hampered by a general lack of infrastructure such as roads and telephones. Poor infrastructure hampers the agent in reaching the farmer as well as making it difficult for the farmer to market his produce. It is difficult to motivate farmers to increase production when they cannot reach the market to sell or find facilities to store their

produce. Finally, lack of equipment such as cars and tractors for both agent and client use, and difficulty in repairing existing equipment was a common complaint of both extension agents and program administrators.

There is little provision for formal extension training in the agricultural education curriculum at either the secondary or advanced levels.

During the fourth year of secondary school, a unit on rural development considers extension, but lectures and program content differ between schools depending upon the expertise of the instructor.

At the école supérieure level, extension receives varied treatment as well. Each institute builds its own curriculum, so the amount of extension training at this level could not be determined. It appears that most knowledge of extension techniques is gained by experience. The agents' technical backgrounds vary from two to four years of college to high school level agricultural education.

There is very little coordination between the research institutes and extension programs. Research institute personnel may participate in seminars or information days, but this seems to be the extent of the interaction. Research personnel have little part in the training of extension agents. Perhaps for this reason there seems to be little translation of research results into extendable technology packages. Many programs, such as OEP's Projet Integré d'Elevage, include their own field trials and procure their own yield data to use as the basis of their extension programs. The importance of coordination can be seen in the extension question as in no other development issue.

The Direction de l'Enseignement de la Recherche et de la Vulgarisation has the formal responsibility for extension. The sous-direction of the Vulgarisation et du Recyclage is charged with conceiving the methods of extending new technologies. The sous-direction is organized into two services: Service des Etudes et Editions (Studies and Publication), and Service de l'Information et du Recyclage (Information and Continuing Education). Etudes et Editions is establishing an information center and acquiring the equipment needed for publication of documents.

Information et Recyclage makes use of the mass media for extension purposes and coordinates the continuing education of professionals. Illustrative of the sous-direction activities is the summary of 1978 activities, the first year after reorganization, as shown below:

Documents	17 published
TV spots	15 hours
Videotapes	60 programs
Radio spots	70 hours total (6 hours-daily, 12 hours-weekly)
Films-16mm	26 users/12 gouvernorats
Film -strips	22 users/10 gouvernorats
International Seminars	17 users/10 gouvernorats

The services of the sous-direction are available to any Ministry of Agriculture agency. Their annual program is made up in collaboration with the other agencies and remains flexible to accomodate their needs. It is up to the agents at the regional and local levels to incorporate DERV services into their extension programs and make their needs known to the officials in Tunis.

At the regional level, extension programs are housed in the services of the CRDA, the development offices such as ODTC (formerly under OMVVM), and agencies such as OEP and the Office des Cereales.

Extension is the largest activity of the ODTC office in the irrigated perimeter at Sbiba. Eight agents serve the 591 farmers within the perimeter. Each agent is responsible for about 72 farmers. The duties of the extension agents include on-farm consultation, credit studies, distribution of seed and fertilizers, provision of farm machinery from the ODTC supply, organization of demonstration plots and information days.

However, despite the emphasis on extension at Sbiba, it seems that simple practices such as weed control and optimum crop spacing are being ignored by the farmers.

Currently, extension outside of the irrigated perimeter is the responsibility of the various services under CRDA. Their activities include consultation with farmers, demonstration plots and information days.

The extension branch of the Service de Production Vegétale was particularly affected by the 1978 reorganization of the Ministry of Agriculture. As a result it is by far the largest of the extension programs and has now added extension agents in some of the local CFPA's. According to the Chef d'Arrondissement, the local extension program is slated for expansion.

The largest and most advanced extension program is OEP's Projet Intégré d'Elevage. OEP is nearing the end of a ten year program of integrated livestock development in Northern Tunisia which included staff training and extension. In an effort to copy U.S. extension methods, American experts were brought in with six specialties--dairy, sheep, dry and irrigated forage, farm management and forestry production. In 1978, the activities of this program included:

3500 small demonstration plots
173 livestock demonstrations
45 field days
35,000+ farm visits

Staff to carry out these activities included 3 technical engineers at each of the 17 regional offices (one in each gouvernorat except Kasserine). The Central Staff is composed of six teams in the six area specialties. One U.S. expert and at least one Tunisian counterpart make up the individual teams. Field staff are visited by a central staff team at least once a month to review their records and aid in trouble-shooting. Twice yearly the field staff participates in an intensive two week training program conducted by the Central Staff. A record-keeping system introduced by the Americans documents not only the agents' activities, but also the progress of farm production in the region.

American participation in Projet Intégré is scheduled to end in September of 1981 but both Tunisian and American officials foresee extension of the project, with continued U.S. involvement, into Central Tunisia.

The Office des Céréales, another semi-autonomous agency under the Ministry of Agriculture, recently completed the extension component of the Tunisian Wheat Program in conjunction with CIMMYT. CIMMYT officials continue to make periodic evaluation visits to Tunisia. Very little data was available in Tunisia about this program, but since it is in the evaluation stage, one should be able to gather more information on the program in the near future.

G. The Planning Framework

The planning framework presented here for the natural resources aspect of ODTC planning has two principal objectives: (1) to establish ODTC as a

primary information center; and (2) to develop a strong technical analytical competency both within and accessible to ODTC. To realize objective (1) we envision a framework of inventories and maps which are the foundation of long-range resources planning. This framework element will be the basis for assessing the feasibility of proposed interventions, in the context of a "sketch planning" process. The information center concept applies to more than just hard data and information. As a product of its coordinative activities, ODTC should become a repository of information regarding various activities and a directory regarding the location and capabilities of particular experts in the region.

Attaining objective (1) is complementary to attaining objective (2). The staffing and work activity of ODTC resources personnel must result in a strong resource-analysis and planning competence, with mechanisms for accessing specialized skills not directly within ODTC as necessary. This analytical capacity will be needed in, and will be strengthened during, the development of the natural resources planning program. It could also be utlilzed frequently in short-term, high priority special studies needed by ODTC for imminent decision-making. The proposed natural resources inventory and planning system is well established elsewhere and thoroughly described in the planning and technical literature of the last decade. Basically, the system is a hierarchy of maps, starting with the traditional maps prepared by particular specialists (geologic, soil and groundwater maps, etc.), and ending with a presentation of resource factors derived from the basic maps that indicate the feasibility of particular interventions.

For example, the second generation soils maps might group soil types by soil salinity or erodability rather than soil series. The third generation maps might translate these soil factors into a map of areas that cannot be readily cultivated, etc. These specific-use maps can then be combined with their counterparts for water, climate, etc... to produce composite map sets. These sets provide a regional view regarding the suitability of the ODTC jurisdiction for any particular use from a natural resources perspective. Proposed interventions based on socio-economic-political-administrative grounds can then be related to the resources of the area proposed for intervention. Of course, specialized studies will generally be necessary prior to final decision-making.

It might be added that the extensive communication and collaboration necessary to the development of this system have the potential for significantly strengthening the coordination efforts of the planning agency.

H. Coordination: Problems and Opportunities*

It has been indicated above that the requisite natural resource technical information exists, and that there is technical expertise available within the region to interpret and manipulate this information in support of the ODTC planning program. Both sources of information and expertise are scattered among many parties. This fragmentation, which exists in all nations to varying degrees, presents both problems and opportunities for the ODTC planning effort. The ODTC response to this division of information, capacity, and authority among the assorted agencies and levels of government,

*The remarks in this section are broadly applicable to the planning effort in its entirety, and are not limited to the natural resources area.

under the heading of COORDINATION, will strongly influence the potential for successful planning. Stated another way, inter-agency and inter-governmental policy and activity coordination are a critical feature of a results-oriented planning program.

"Coordination" is the process by which mutually harmonious objectives are identified and pursued by parties at interest. Coordination involves 1) communication, i.e., the exchange of information, and 2) conflict resolution, where differences exist among parties. Successfully carrying out these coordination functions, will be among the most difficult tasks for ODTC and its staff.

In the ODTC context, this means establishing a continuous process and an institutional network involving related organizations and their specific technical specialists. Institutional agreements must be reached for sharing needed data and information systematically, and for quickly and readily accessing relevant reports, or technical opinions and expertise. We want to also stress the importance of <u>informal</u> communications which take place among professional peers...within the region, within the nation, with professional colleagues and research institutions, and elsewhere in the world. Many studies have shown the importance of this informal communication system in achieving effective coordination.

Coordinative arrangements and efforts should be undertaken at several levels:

- among ODTC staff and professional groupings
- among ODTC and "sister" Ministry of Agriculture agencies
- between ODTC and other ministeries (perhaps at the national as well

as regional administrative level)

- between ODTC and relevant research institutions.

Finally, there must be good coordination between ODTC and American and other subcontractors to assure an effective advisory relationship.

I. A Critique of the Proposed Interventions to be Financed by A.I.D.-Tunisia

1. Small Holder Irrigation

The small holder irrigation project anticipates the improvement of about 300 existing shallow wells, the construction of about 200 new shallow wells, the development of about 100 springs and three new irrigated perimeters based on four existing (but not operating) deep wells. As is discussed elsewhere in this report, the technical data on soils and ground water seem to be adequate for the planning phase of this project. Implementation in some areas may require additional data on water quality and soils. Small holder irrigation is viewed as a matter of capital investment in the well development and the simple delivery system. The technical assistance phase is modest though not trivial. The water or irrigation experts will be brought in for about one month during the irrigation season and another month during the winter. In consultation with the ODTC technical staff, an agreement will be made on what practices should be introduced into the irrigated perimeters through the Extension Program. Our cursory inspection of the irrigated perimeters indicates that current water scheduling is far from optimum. For the consultants to be of maximum assistance, they must be able to do at least a crude water budget for some of the irrigated

fields. The amount of water applied per unit area should be determined and an estimate made of deep percolation. The equipment needed is simple but should be arranged for in advance with the consultants. The experts' findings would then be used as a basis for a second year of tests which would presumably consist of modifying irrigation schedules and subsequent crop water use and yields.

We concur in the proposal's position on flood irrigation. Once the irrigation program is worked out with the ODTC staff, fertility practices and weed control should be included as part of the management package. Each of these inputs has economic as well as labor and training implications. In order that the U.W. team continue to be aware of the planning activities in all sectors and thus carry out its responsibility to ODTC, it is important that there be a clearly established process for coordination between U.W. and other U.S. contractors.

We have one serious reservation about the assumptions in the small holder irrigation proposal. Salinity is given little consideration as a potential problem. It is especially important for the Foussana irrigated perimeter extensions. In view of the high salt content of some of the wells (both deep and shallow) the project plans may be too optimistic. The salinity situation is detailed in the Practices and Problems section of this paper. The appropriate experts in the Direction des Ressources en Eau et du Sol should be consulted before the plan is implemented. We also urge that at

least one of the irrigation experts brought in be fully conversant with salinity problems.

The subproject paper concludes that massive technical assistance in the irrigated agricultural sector is not warranted based on the assumption that suitable practices can be conceived and implemented in a short while. Although it is true that massive intervention is not necessary, it has been learned through sad experience that if irrigated agriculture in arid regions is to be permanent, even on a small scale, then permanent technical capability is mandatory. Long-term staffing of the Tunisian research organizations must include irrigation experts with knowledge of salinity. There are sufficient areas of saline soils in Tunisia to justify this conclusion.

2. Dryland Farming

The dryland farming project is much more extensive in scope than the irrigation subproject because the acreage involved is much greater and because the technical difficulties are much more intractable. In essence, the project's objective is to develop a package of management practices and a repertoire of grain varieties to improve yields over a wide area with a minimum of technical assistance and monetary investment. As documented earlier in this paper, some simple improvements in management practices could yield great improvements.

The proposed technical interventions are straightforward, but the

strengthening of the research station at Le Kef with U.S. scientists is urgently needed to ensure sufficient experience. The recommended distribution of U.S. experts seems reasonable at this time but the contracting university should have the option to modify it as they come to understand the problems involved. However, since water management is so crucial this expertise should be specified from the start. An expert in soil-plant-water relationships is vital to this project in order to ascertain why a given combination of varieties and management practices produces a given effect on yields. This case is an example of the need for coordination between long-term staffing plans for the Institute at Le Kef and proposed interventions. The alternative is a steady stream of foreign advisors with no one in place to act on their advice.

It is essential that the ODTC technical staff be able to interact with experts such as those at Le Kef so that the scientific information can be used effectively in the planning program. Without this capability, the agricultural interventions are certain to fail since they cannot be implemented by the scientists.

The research program at Le Kef could be greatly promoted through involvement in the International Atomic Energy Agency/FAO Joint Division of Atomic Energy in Agriculture program related to water and fertilizer use in arid countries. It would seem highly advisable that Tunisian officials contact FAO to join this program with the work to be done at Le Kef. Adequate staff for the Institute should be recruited immediately, but if the contracting U.S.

university is not chosen in time to advise on this issue, the Wisconsin team is prepared to assist.

In conclusion, the objectives and approach of the small holder irrigation and dryland farming projects seem well conceived. With reasonable planning and implementation they can certainly lead to significant increases in agricultural yields. The exact details of the project should be left flexible enough that the contracting university can be of maximum assistance. There should be frequent consultation between ODTC, U.W. and the contracting university to ensure a common goal and united approach.

3. Potable Water

We have reviewed the subproject paper and the technical analysis by Louis Berger International. (We understand that the potable water subproject paper is being redrafted.) We agree fully with the water development technology recommended by the latter paper. The intervention should move ahead as soon as possible. No single technology can provide a unique solution. There is sufficient information and technical expertise to begin. Early testing of simple adaptations will indicate their utility in the Tunisian context. At this point further economic analysis will produce little information. The decision to move ahead is a political response to the "felt needs" of the people.

IV. THE LOCAL ECONOMIC SYSTEM RECONNAISSANCE

A. Introduction

The objectives of this reconnaissance effort were to investigate the following:

1. The manner in which the agricultural system of Central Tunisia operates at the household, village, and regional level.

2. The local economic system, particularly problems of productivity, profitability, marketing, and unemployment in an attempt to determine the decision-making context in which farmers, non-farm entrepreneurs,and those providing assistance operate--with an

emphasis on the poorer members of society.

3. The potential of existing and proposed projects within the region.

The conclusions and recommendations are based on interviews with a number of farmers, government officials in service and research organizations, private entrepreneurs and agricultural specialists; analysis of available statistics, documents, and reports; and on visits to on-going projects in the region.

Some of the subjects discussed in this section have already been discussed in sections II, and III, particularly issues of social organization and agricultural extension. In this section these earlier comments are elaborated from an economic viewpoint. Nevertheless, these observations should be related to the support system model developed in section II. This model shows the relationship of the economic system, social organization, and cultural tradition and presents an approach to an integrated understanding of conditions in Central Tunisia.

B. Agricultural Base of the Central Region

Within the eight delegations of the present project area, the small-mixed farm with dry-land crops, irrigated fields and a livestock component comprises the basic unit of production. Agricultural production consists mainly of grains (wheat and barley), tree crops (olives, almonds, apricots, figs, apples, pears, peaches and pistachio), cactus (for fruit and fodder), various vegetables (principally from the irrigated areas), cattle, sheep, goats, poultry, camels, donkeys, mules, and horses. In addition, in many areas farmers may also be involved in apiculture, in hunting, or in collecting either alfa or

rosemary. Farming is practiced on both dry and irrigated lands while agricultural producers in the irrigated areas may have land within the irrigated public permmeters or alternatively they may have access to a shallow well on or near their individual land holdings.

1. Irrigated Public Perimeters

The agricultural economics team visited two irrigated perimeters in the region, Sbiba and Djilma, both of which are presently administered by the ODTC. These perimeters principally produce apricots, apples, peaches, olives, pistachios and vegetable garden crops. In addition, there has been a major extension effort to introduce an improved dairy cattle breed (pie noir) at both perimeters as well as the promotion of poultry production.

The irrigated public perimeters throughout the central region were established to accomplish the following objectives: sedentarize farmers; find better ways of using existing water resources; teach irrigation techniques to farmers; and introduce new crops, new varieties, and new agricultural practices through extension agents. Presently, the government provides water to farmers owning land within the irrigated zones at only one-sixth to one-third its cost. At the same time, it furnishes various other subsidized inputs (e.g., fertilizers, seed, plows or tractor services, improved livestock and barns.)

The initial goals of the irrigated perimeters have only nominally been achieved in that surplus garden vegetables for market sale are produced, new and improved tree crop varieties have been planted, and some instruction in irrigation techniques in farming has been provided. On the other hand, and much

more importantly, a variety of new problems have been introduced with serious consequences for future agricultural production in the region. Since water is so heavily subsidized, many farmers use it wastefully and fail to do weeding and other needed water management and conservation practices. Farmers are constantly petitioning délégues, and governors for additional water supply allotments. At present the ODTC staff responsible for extension,are so busy keeping water flowing in the irrigated perimeters that they have little time to provide other assistance and advice to farmers. Other agricultural inputs are often not available when needed or at a higher price than farmers were quoted when they placed their orders.

Farmers have become so dependent on government services that when a bottleneck occurs in the supply of inputs they are said to make little effort to locate items needed and sometimes leave fields unplanted. In addition, there are significant irrigable acreages that are not cultivated because of land tenure problems.

The irrigated perimeters have received substantial attention from the gover ment both in terms of an intensive extension effort and subsidized farm inputs. However, only a very small proportion of the population has benefite from this government intervention. It is interesting to note that the aver farm income is only about half that achieved by farmers irrigating from the own wells outside the perimeter. At this juncture, the role of the irrigat public perimeters should be carefully reviewed in order to determine their future contribution within the agricultural sector.

2. Shallow-Well Agriculture

The agricultural economics team visited farming operations which practiced both irrigated and dry land farming in the delegations of Djilma, Sbeitla, Foussana and Djedlianne. A common path for individual eco-

nomic improvement, especially in the last few years, has been to convert savings into shallow wells, commonly six to ten meters deep which often irrigate three or four hectares. While farmers continue producing grain crops, as well as planting olive and almond trees in the dryland areas, they can expand their production to include vegetables and fruit trees (apricots, apples, peaches, plums, etc.,) in the irrigated areas.

With profits from such acreages farmers often dig one or more additional wells, buy a pickup truck or tractor (which appears to give high returns partly because of imperfections in marketing), or build a house in town for rental income. Commonly farmers pool funds with relatives and start with only a fourth of a well then gradually expand. However, lacking the means to get started by group action, a healthy and enterprising farmer in a zone with a suitably shallow water table can dig the well in his spare time and initially draw the water by hand or animal power and save the profits from the relatively small areas that can be irrigated in that manner until a sufficient sum has been accumulated to buy a pump.

Shallow well farmers are said to be open to innovations and to have conspicuously high rates of savings when compared to farmers on irrigated perimeters. On the other hand, they are said to commonly build their wells inadequately hence are unable to deepen them if the water table falls, as it has in some parts of Sidi Bouzid.

Although this is a sector of demonstrated enterprise and rapid growth,

it may soon result in serious resource management problems parallel in origin to the problem of overgrazing unless future plans and policies provide for adequate mechanisms to regulate water use.

3. Dryland Agriculture

The majority of the population practices dryland agriculture. This mode of production is characterized by greater variations in enterprise problems and potentials than irrigated agriculture. Thus far, we have had time to survey only a few of the delegations, Djilma, Djedliane and Makthar, but our brief exposure suggests that in the dryland farming region there are areas that have large and relatively productive acreages of wheat and barley in addition to cattle and sheep raising. On the other hand, there are some areas heavily dependent on income from livestock production, sheep and goats, harvesting of alfa and remittances from migrant labor as plantings of wheat, barley and tree crops are insignificant. In areas where alfa is not available, there is the alternative of cactus plantings and certain tree crops (olive oil, almond and pistachios). Furthermore, there are farmers who also collect rosemary for oil distillation or practice apiculture for honey production.

Water availability differs greatly amongst dryland farmers. In certain regions water is fetched once or twice daily by a family member entailing a thirty five kilometer round trip each time while other regions must purchase potable drinking water at least seasonally.

Added to this sort of variation in farming enterprises and water availability, there are great differences in the degree of isolation, in the potential for developing surface wells, in the extent to which there is fragmentation of land-holdings, in the severity of overgrazing, and in the variation in soils, rainfall, frost, and erosion. To the present, needs of the dryland farmers have hardly been determined or addressed as most government assistance and public projects have focused on the irrigated areas. Low-cost interventions yielding short-run economic benefits should be encouraged in the dryland agricultural areas.

4. Research and Extension Services within the Agricultural Sector

On-going research and extension services have not effectively reached the bulk of the agricultural producers. In addition to inadequate numbers of extension agents and a lack of vehicles and physical infrastructure, there are a number of other problems.

There has been relatively little research in problems of raising farm income levels, except in irrigated agriculture and even that is incomplete and of uneven quality. Identification of constraints found at the farm level and how they vary from area to area has received scant attention. For some aspects in the production of certain crops, there are results available for various innovations under experiment station conditions, but no systematic work on the particular agronomic and economic conditions confronting the small farmer has been undertaken.

When there is difficulty in getting the experiment station interventions extended to farms, there is a tendency to explain it as a result of the "mentality" of the farmer. We were constantly told that the populations of Central Tunisia were only recently nomads, therefore, crop production is new to them and they need to be taught agricultural practices. It may not be insignificant that where farmers have received the most intensive extension effort (in the irrigated perimeters) farm income levels fall far below that achieved by farmers practicing irrigated agriculture outside the perimeter. Similarly the reluctance of farmers to buy pure bred cattle (and their tendency to sell the cattle they are provided and invest in sheep) is attributed to their nomad "mentality". There is,however, good market price evidence to indicate that sheep yield a higher rate of return on meat production than do cattle. Based on field investigations coupled with an analysis of existing literature; it is our impression that extension workers are poorly trained and lack an understanding of the true problems confronting the agricultural producers.

5. Resource Constraints Entailed in Agricultural Expansion

The hazards of rapidly changing the technical capacity of a region are especially pronounced in semiarid areas such as Central Tunisia where the balance between population and resource use is fragile and where the increasing pressures on water and arable land are already being felt.

Until recently the difficulty and expense of obtaining water has

served to "naturally" ration it in many areas. Either the initial expense of well digging or the onerous task of transporting water have restricted its use. Now, however, many more farmers have the means to finance well digging or (for those in the irrigated perimeters) have access to irrigation water at prices much below the cost of otherwise supplying it. I either case the true value or scarcity of water is not being reflected in its cost to the user.

At this juncture it appears from our observations and from fragmentary statistics on wells in the FAO study of Sidi Bouzid that surface wells are increasing in number at an accelerating rate. In the short run this phenomena augurs well for farmers and reflects a dynamism readily apparent in Central Tunisia. A principal way for a farmer to expand production possibilities, reduce dependence on variable rainfall, and increase income is by developing a surface well. Pooling resources or selling a flock of sheep are only two of perhaps many ways farmers manage to self-finance surface wells. Therefore, even without additional interventions which aid farmers in digging wells or which provide low-interest loans for pumps, there is likely to be an expanded use of water for irrigation purposes in the coming years. Without adequate rules or institutions to regulate the use and distribution of an increasingly scarce resource, the negative impact on the environment or on the distribution of income among the population may be substantial. In some cases where a spring or other water source is held in common, traditional rules govern the distribution of water that is tying water rights to land rights with irrigation water apportioned according to the amount of land held. In other areas, however, it appears that institutions have yet to be developed and water

is still a "free good" for those with the means to tap the source.

In many areas pressures on pasture land are also acute. This is exacerbated by the fact that the rules and rights governing the use of land are no more clear and enforceable than those for water.

Semiarid regions are susceptable to a problem where a commonly-held resource, such as grazing land or water, deteriorates if enforceable rules are not developed to govern its use. In additional work in the region, highest priority should be given to study of institutional changes needed concerning rights to water and pastures to keep pace with the many technical changes occurring either naturally or induced by government interventions.

C. Priority Areas for Expanding the Economic Base

The agricultural sector provides the foundation for the economy of the central region of Tunisia. Expansion of tree crop plantings, improvement of livestock production, and increased processing of fruits and vegetables represent the areas of intervention most likely to generate increased income earnings for both farmers practicing dryland and irrigated agriculture. The critical element in strengthening the economic base rests with the establishment of an efficient market structure capable of integrating collection, processing and distribution of agricultural produce. Small growth centers must be identified to provide processing facilities and storage and market infrastructure. Overall market performance will determine the economic returns received by the farmer from increased agricultural production as well as

total costs paid by the farmer for agricultural inputs and consumer items.

1. Financing Farm-level Interventions

New agricultural activities will only be implemented if the farmer can amass savings from surplus production or generate credit from formal or informal financial arrangements. Initial investigation of the project area and target population provided an insight into the variety of credit systems presently operating.

a. Formal Credit

Formal credit for agricultural needs can be obtained from a variety of agencies, including the Banque Nationale de Tunisie, which has a comprehensive credit program, theoretically intended to serve the bulk of the population. The B.N.T. which was established in 1959 provides agricultural credit in four different forms: 1) seasonal credit with a six month repayment period at a six percent rate of interest; 2) short-term credit with a one to two year repayment period at a six percent rate of interst; 3)medium-term credit with a two to seven year repayment period at a four percent rate of interest; and 4)long-term credit for a period exceeding seven years at a four percent rate of interest. Seasonal and short-term credit comprises the bulk of the credit provided by the B.N.T. and is used basically to purchase seedlings and other agricultural inputs used in the production of cereals and vegetable crops. In obtaining seasonal and short-term credit, a farmer does not have to furnish legal title to his property as long as the ommdah will verify the amount of land the man

cultivates. Medium and long-term credit is much more difficult to obtain as few farmers hold the legal title to their land which is required. Farmers generally solicit this type of credit in order to purchase equipment for wells, agricultural machinery or to provide capital needed to undertake the establishment of an orchard. To assure that the loans are not diverted to uses other than those stated in the application, the B.N.T. issues vouchers for the amount of the loan which are negotiable at various government-operated supply centers, e.g. Office des Cereales for obtaining wheat or barley seed.

The Projet Alimentaire Mondiale (P.A.M.) has a credit program designed to reach the poorer dryland farmers. P.A.M. loans (which are partly grants--only 60% must be repaid) can be used for two purposes: 1) to increase forage crop production with a five year period of repayment or 2) to introduce tree crop production with a ten year period of repayment. Almost all recent loans are used for forage crops as the short-term economic yields are high for increased livestock production, and tree crop plantings often entail a five to ten year gestation period before the producer receives the first economic returns.

While P.A.M.'s credit program only reaches a restricted number of farmers, the B.N.T. credit program is designed to be much more comprehensive in its coverage. In addition, credit is provided to agricultural producers from a number of other sources including the Office du Développement de Tunisie Centrale (O.D.T.C.) and Fonds Spécial pour le développement agricole (F.O.S.D.A.).

At present the formal credit system appears to have a number of problems. Default rates are high - often thirty percent or more, but there seems to be considerable variation from program to program. Interest rates are subsidized with the result that credit is rationed not by its cost but by other arrangements which tend to channel it to those who are politically powerful so that current credit programs seem to help mainly the larger farmers. There are unnecessary delays between loan application and approval and an excessive amount of red tape, much of which is designed to force the farmer to use the credit provided for specific purposes and not others. (Nevertheless, it is reported that farmers commonly manage to circumvent such regulations.)

The literature suggests and observations of this region confirm the fact that few of the small farmers have much contact with banks. But this does not mean that they have no means of saving, obtaining credit, or that they are unable to amass resources sufficient to make significant investments at times. Almost all farm commodities - except the most perishable and even these can often be processed to reduce perishability - can be sold at different times in the cycle of maturation, harvest, or storage. We found numerous crops being sold before maturity at prices under those expected at harvest time. This form of sale provides the farmer with a form of credit -- early payment on a crop not fully "produced" -- with the difference between harvest time prices and the price received by the farmer as a type of interest on the "loan". Similarly we found instances where farmers sold most of their wheat substantially after harvest time (in the month of December) to take advantage of the seasonal price rise in wheat. Thus

wheat may be held as a store of value or an appreciating asset. Perhaps the commodities most easily kept as a store of value are livestock and cactus -- both of which can be harvested at almost any time in the life cycle. And,we found instances where both sheep and cactus had been held and then cashed in for a major investment -- in both cases for a surface well. The rapid growth of surface wells in recent years suggests that many farmers can themselves finance innovations when they perceive the return to be high.

There also appears to be a great deal of informal (non-market) exchange of products and services. Payment-in-kind is found for a wide variety of activities. Much of the wheat and barley is harvested by families who receive one-tenth of the crop, plus pasture for their animals during harvest, as payment. Olive oil processing commonly is paid for by giving the mill ten percent of the oil extracted. Many farmers sharecrop, one party providing the land (and sometimes water or other inputs) while the other party provides all the labor and receives one-half of the harvest. Land also may be acquired by investing labor --one party provides the land, the other plants tree crops and cares for them until they are bearing and at that time receives half of the developed orchard in payment. In addition, farmers may exchange parcels of land or days of labor.

Furthermore, financial needs of farmers are often satisfied partially by sources of income derived outside of their own crop and animal production. A large proportion of farmers either work from time to time as casual laborers in agriculture, in Tunisian urban centers, or

abroad (mainly in Libya and in France) and many have sons in such employment who send them remittances. In many areas farmers can also pull alfa in the winter (the slack agricultural season) to augment their incomes. It was reported that a family with two people working can earn TD 2 a day harvesting alfa with the maximum annual income earned from alfa averaging around TD 200, a sum which is approximately one-fourth of the annual income of farmers in irrigated perimeters. Spinning and weaving of wool, basketmaking, and collecting rosemary and sagebrush (in mountainous areas) provide additional sources of income. Cottage distilleries operate on a sporadic basis to process the rosemary and sagebrush into oil.

Since farmers obtain income and financing from a wide variety of sources ranging from formal bank loans to remittances and the sale of crops, the need for credit and the extent of informal credit sources varies from area to area. Thus potential local savings and the nature of the informal local credit system need to be carefully investigated before a credit component is included in any specific intervention. Furthermore, the appropriateness of the credit component will be a crucial factor in the farmer's willingness to undertake new agricultural activities or expand existing agricultural operations.

2. Livestock

Improvements in livestock production would touch a large proportion of the population as practically all farm families have either sheep and goats or work animals and many have some cattle or poultry.

Yet, to date relatively little attention has been given to livestock and much of that is confined to irrigated areas, where farmers are already relatively well off.

Efforts to improve goats, the most efficient meat and milk animal in the desert areas and also in some of the more humid mountainous areas, are practically non-existent. This may be the result of concerns that such efforts might put more pressure on pastures which already are overgrazed. Thus, among government officials one encounters the belief that while interventions involving goats might indeed reach many of the poorest farmers for whom little is now being done, the cost in terms of further damage to pastures and forest already under stress would be excessive. Clearly the answer depends on the nature of the intervention. Priority should be given to exploring the potential for genetic improvement of goat herds and the probable impacts that would result. The only INRAT (Institute National de la Recherche Agricole de la Tunisie) research station serving the region (located at Ousseltia) added a small flock of milk goats to its operation in 1978. It does not seem to have yet developed a serious research program.

Sheep are also widely found throughout the project area hence related interventions would have a similar potential for reaching the poorest farmers. In addition, sheep are thought to be less likely than goats to contribute to overgrazing. INRAT does have a program for selling Barbary rams at a subsidized price to selected farmers, but they seem to know very little about the ways Barbary sheep are superior to local breeds. Like most other people involved in research and extension ser-

vices in the region, the INRAT officials are pushing their interventions largely as a matter of faith with little grasp of precisely how farmers will be affected. INRAT sold about 100 Barbary rams in 1977, but many, perhaps most of them went to farmers in the Kairouan Gouvernourat and to others not part of the target area population.

In addition, the Makthar area has a sheep dipping program to reduce the frequency of mange. No one could give us any substantive evidence regarding the extent to which farmers benefit from the program. However, it is said to be popular with local herders.

At present, the research effort for all types of livestock is alleged to be limited to the sheep research mentioned earlier at Ousseltia. Extension services consist of four poorly trained livestock extension agents at Kairouan who last year were able to work with only 100 farmers around Kairouan. Several small programs to introduce pure bred cattle and promote poultry production in some of the irrigated perimeters have been undertaken.

There are efforts to improve pastures and feed. In the more arid zones pasture efforts are mainly confined to planting cactus, atriplex, and acacia. Elsewhere there are at least plans to improve grasses. So far there has been no plan implementation. The Office de Elèvage et Paturage (OEP) experience in pasture improvement and feed production is limited to the more humid areas of northern Tunisia. They seem to know little yet about the problems associated with extending their efforts to Central Tunisia. Their feed production program has concentrated on efforts to get northern Tunisian farmers to grow irrigated

alfalfa in the winter and they claim some success. In Central Tunisia no one we talked to had a good understanding of why farmers in irrigated agriculture often leave much of their irrigable land idle in the winter even though there is plenty of water to irrigate their entire holdings. OEP is trying to convince farmers to grow forage crops on land not used for winter vegetables. Farmer reluctance may involve labor constraints or lack of adequate incentives given current costs and returns. This question deserves high priority in investigations planned this fall since it appears there is considerable unused capacity for forage production in winter months.

With improved feed supplies and further expansion of exotic dairy cattle breeds, milk production could be substantially increased and imports reduced. However, a better understanding of marketing problems will be needed and alternative practices implemented before production increases can be fully transmitted to consumers. We are told that where milk production has been increased, deterioration of roads in the rainy season, and the failure of milk buyers to collect milk regularly even when roads are easily passable, result in significant amounts of milk being wasted (poured on the ground) or fed to dogs. Because pigs are taboo and poultry production is rudimentary in most areas, farmers do not have a ready means of converting sporadic surpluses of milk into meat.

Efforts to develop poultry production have thus far been limited to parts of the FAO project in Sidi Bouzid. Introduction of better poultry would seem to deserve high priority in the list of topics for further investigation because it is an innovation within the

means of even the poorest farmers and one which would seem to be feasible for dry land and irrigated agriculture alike.

A sizeable percentage of dryland farmers have no draft animals but the existing data are insufficient to determine the reason for this or the probable impact of interventions to help farmers obtain draft animals.

Cactus

Cactus is an important crop throughout the region and one of the main resources of the drier areas. Cactus leaves (or rackets) are fed to livestock or sold to other farmers short of fodder. (There are two types --spiny and spineless cactus. Camels can eat the spiny rackets directly but the needles must be burned off and the rackets chopped up before they can be consumed by other livestock. All livestock can eat spineless cactus as it grows.) The literature and our own field investigations provide examples of farmers selling cactus to obtain funds needed for farm inprovements such as digging shallow wells or equipping wells already dug with pumps. In times of drought, such as 1977, cactus is said to have provided the margin needed to enable flocks and herds to survive in most areas of Central Tunisia.

Cactus fruit is eaten and is fairly important in the diet seasonally. It is sold in markets as distant as Tunis. In addition, spiny cactus is planted to fence off areas throughout the region.

3. Tree Crops

Tree crop production entails an initial investment of capital which does not yield a return until several years later, but does provide a

permanent source of income when trees begin to bear. Within the central region of Tunisia, olive (for oil), almond, fig, local varieties of apple, and pistachio trees are cultivated largely in the dryland areas while apricot, apple (Golden Delicious), peach, cherry, plum and olive (table) trees are grown in the irrigated areas. (See Table II on the following page.) Perennial fruit crops represent an excellent source of income for producers but as plantings increase market impacts must be considered. In projecting supply levels, total production is a function of hectares cultivated and tree yield which is dependent upon the age of the tree, the nature of the individual tree's production cycle, the degree of maintenance of the tree crop as well as weather conditions. The length of the gestation period differs greatly among tree crops. For example, an olive tree does not come into full production until fifteen years after planting while an apricot tree begins bearing fruit after four years and will be in full production within seven years. Furthermore, the degree of maintenance of tree crops over the years can have a considerable effect on yields. For example, two farmers residing in the irrigated public perimeter of Oum Laadum (Djilma Delegation) had the same number of olive trees of the same age. The farmer taking better care of his trees harvested 49 quintals of olives receiving TD 370 but the second farmer harvested only seven quintals of olives (worth only TD 56) the same year.

In expanding the cultivation of tree crops, attention should be focused on the introduction of varieties with a good market potential; on development and diversification of the processing operations for

TABLE II

TREE CROP PRODUCTION

TREE CROPS	TIME OF YEAR PLANTED	MONTH HARVESTED	# OF YEARS UNTIL BEAR 1ST FRUIT CROP	# OF YEARS UNTIL COME INTO FULL PRODUCTION	NATURE OF AGRICULTURAL CULTIV. DRYLAND OR IRRIGATED
Olive Table Oil	December - beginning of March	Dec. - Feb.	5 - 7	13 - 15	Irrigated Dryland
Apricot	December - beginning of March	June	4	6 - 7	Dryland and Irrigated
Apple Local Gold.Del.	December - beginning of March	July Aug.	4	6 - 7	Dryland Irrigated
Peach	December - beginning of March	Aug.	4	6 - 7	Irrigated
Pear	December - beginning of March	late July/ Aug.	6	8 - 9	Irrigated
Cherry*	December - beginning of March	late June/ July	6	8 - 9	Irrigated
Plum*	December - beginning of March	late July	4 - 5	7 - 9	Irrigated
Almond	December - beginning of March	May/ June	4	6 - 8	Dryland
Pistachio	December - beginning of March	Aug.	12	14 - 15	Dryland
Fig**	December - beginning of March	late Aug.	7	9 - 10	Dryland

* Cherry and plum trees are cultivated in dryland areas in Makthar and Tnala regions.

** Some areas fig trees are cultivated within irrigated zones.

perishable fruits; provision of adequate storage facilities; and careful monitoring of both domestic and foreign demand.

In past years the price of olive oil has fluctuated considerably but with new market outlets in other Arab countries the price has stabilized at a somewhat higher level. As olive oil can be stored for approximately five years without having a detrimental effect on quality, expanding storage facilities can afford processors the opportunity to restrain market supplies when there is a glut thereby stabilizing the price level. Recently there has been increased attention given to planting table olive varieties which have similar agronomic and production requirements as oil varieties, with the exception that table olive varieties require higher annual rainfall. Hence, they must be irrigated in most of the central region. In any event, diversification by substituting table olives for oil varieties in future plantings will not only reduce potential olive oil supplies, but may provide producers access to an additional market outlet not now available. Finally, additional research on the use of olive pulp as a livestock feed should be further considered.

Apricot trees are widely planted throughout Central Tunisia. For the most part, producers either harvest the trees themselves and sell the fruits directly in markets or they sell the fruit while still on the trees, slightly before maturity but at a lower price, to a merchant who harvests, transports, and markets the fruit. Last year sales to processing plants were down because prices offered were fixed at a very low level by the government with a large differen-

tial between the market price and the price offered by the processing plant. Farmers will only increase production of apricots when they are assured of outlet providing a reasonable price.

One interesting intervention may be an apricot drying component in fruit processing plants. At present farmers home-dry apricots only for use as a condiment with red pepper in the preparation of stews. Improved drying methods, whether at the farm level or in processing plants, could provide diversification in use of apricots and perhaps establish dried apricots as an export.

Apples are grown on a somewhat limited scale and yield a small apple of poor quality, for the most part. Recently, the Golden Delicious variety has been planted in Sbiba, Thala and Foussana. If the initial yield from these trees is promising increased planting throughout the irrigated areas (and perhaps in the relatively humid mountainous dry land areas) should be undertaken.

Demand for almonds tends to remain high throughout the year. They can be stored over a long period which reduces the necessity of immediate shelling and consumption of the crop. Introduction of mechanized shelling at the Gammoudi processing plant at Sidi Bou Zid would allow for further diversification in processing activities. This activity would provide employment in slack months, and probably would reduce overall operating costs. The plant manager appears to be interested in expanding the seasonal operations to encompass almond crushing, as this activity can be carried out on an annual basis.

Pistachio trees yield a high value product (recently pistachio nuts were retailing for TD 3.5 per kilo in Tunis). One farmer in an area where we did field work is said to have sold the nuts from 40 trees for TD 800 this year, an amount about equal to the average annual income of the irrigated perimeter farmers in Sidi Bou Zid gouvernorat. A major problem in increasing pistachio production is the need for a specific number of male trees surrounding female trees in order to obtain adequate pollination. This is difficult to regulate at the time the seedlings are planted.

In summary, increased tree crop production may be a means to augment income levels of both farmers and processing plants if market channels are improved, processing operations are expanded and diversified, government price policy is changed, and promising new varieties are introduced.

4. Marketing

Within each delegation center there is a main weekly market where producers from surrounding areas come to sell and buy livestock, agricultural products, and a variety of household goods (see Table III on the next page).. Throughout the remainder of the week, a permanent market operates on a smaller scale in some of the larger delegation centers. At the large weekly markets both producers and merchants act as buyers and sellers while at the smaller daily market, merchants tend to be the principal sellers. In addition, small weekly markets are held in most of the sectors within each delegation.

TABLE III

MARKET DAYS WITHIN THE CENTRAL TUNISIA TARGET REGION

Delegation	Market Day
Foussana	Sunday
Thala	Thursday
Sbiba	Friday
Sbeitla	Wednesday
Djedliane	not ascertained
Djilma	Tuesday
Rohia	Saturday
Makthar	Monday

MARKET DAYS OF OTHER CENTERS WITHIN OR NEAR THE TARGET REGION

Center	Market Day	
Ben Abbes	Saturday	
Breka	Monday	(Djedliane Delegation)
Essabella	Monday	(Djilma Delegation)
Feriana	Monday	
Hababsa	Wednesday	
Hajeb el Aouin	Tuesday	(Djilma Delegation)
Hassi El Ferid	Saturday	(Kasserine Delegation)
Kairouan	Sunday	
Kasserine	Tuesday	
Lahat	Sunday	(Between Hababsa and Hajeb El Aouin)
Sidi Bouzid	Saturday	Main market day
	Friday	Camels and other beasts of burden
	Sunday	Cattle

An individual producer has several alternatives regarding the manner in which he markets his produce. He can market his goods directly at a market in his region which perhaps entails either leaving his home a day before the market is held in order to transport his goods in carts or on animals or renting a truck the morning of the market day. It is unlikely that he has definite price information other than that which he has heard from relatives or neighbors. Alternatively, the producer may sell his produce at the farm gate to a merchant broker who then transports and markets it. As travelling merchants seem to be few, a farmer in a remote area probably has little bargaining power in terms of determining the price he receives for his goods.

There are two widely reported marketing arrangements for tree crops which involve purchase of a crop before harvest. In one arrangement a farmer with a sizeable crop of olives or apricots sells the fruit slightly before maturity, perhaps one or two weeks before harvest time to a merchant who hires workers to harvest the fruit and who then transports and sells it directly in the markets. We encountered one such case in Sbiba where a merchant had purchased the fruit from 140 apricot trees for TD 1,600 in late June. The other arrangement involves selling the tree crop on the tree as a form of credit for the producer. If a farmer is badly in need of credit he often seeks a merchant to purchase his first crop long before harvest time. The farmer is said to receive approximately 40 percent of the total payment at the time of sale and the balance after the merchant has harvested and marketed the fruit. In addition, the price paid is said to be substantially below what the farmer would have received had the need for credit not

forced him to sell the crop well before it was ripe.

The bulk of the agricultural produce is marketed fresh because processing facilities are limited in number and largely uneconomical due to government price policy. The largest processing operation is the Gammoudi plant in Sidi Bou Zid established in 1975. All the processing activities are conducted on a seasonal basis, apricots in May and June; tomatoes from July 15 to August 15; peppers from August 15 to the beginning of December; and carrots during the month of February.

Other than the drying of hot peppers, there appears to be very little home drying of fruits and vegetables. Several small private oil crushing plants operate in the region, but the bulk of the olives are crushed in the large plants in Sousse and Sfax operated by l'Office de l'Huile.

Produce is stored on the farm in a variety of ways either to satisfy domestic needs throughout the year or to obtain higher prices when market prices increase seasonally. Grain is stored in underground pits, hermetically sealed, hence storage losses should be nonexistant or very low. However, one official suggested that losses in some areas may be as high as twenty percent. This is a topic that needs investigation at the farm level. Farmers store olive oil in large earthern jars in their homes. Unharvested cactus acts as a means of storage in that the crop can be left unharvested as long as needed, then harvested for domestic use or sale to those who are short of

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fodder. Fodder, whether cactus or other kinds, can also be stored in a sense by feeding it to sheep, fattening them for later sale (e.g. just before the holiday of Al Aid, the period when the demand for mutton is said to peak).

There are few large storage facilities acting as collection and distribution centers within the region, although there are some, operated by l'Office des Cereales and l'Office de l'Huile, for grains and olive oil, respectively.

It appears that individual producers, particularly the smaller ones, confront innumerable constraints in obtaining competitive prices for their agricultural products. Lack of adequate price information may be an important factor. Small farmers reported that they rely largely on price information gained from their visits to local markets and on advice of neighbors and friends. Larger producers appear often to have contacts in distant markets with whom they regularly exchange information. Most farmers have radios and listen to agricultural broadcasts. Communication of price information by radio would allow them to discover which markets provide the highest returns and might assist them in production decisions as well.

Another problem farmers frequently face, especially for fruit and vegetable crops, is a wide fluctuation in prices from one season to the next. In 1978, for example, onions sold for 5 millimes/kilo in Sbiba, causing farmers to greatly reduce 1979 plantings. Plantings were so reduced that in 1979 the price of onions skyrocketed to 100 millimes/kilo. Analysis of appropriate measures to reduce year to

year and intrayear price fluctuations is greatly needed. The establishment of realistic floor prices for essential commodities might be considered.

In many areas the lack of an adequate road and transport system reduces farmers' access to market centers and forces many of them to conduct their market transactions with one or two market intermediaries who visit their farms. Since very few farmers own trucks or tractors and trailers, they either load their goods on a cart to be pulled to market by a draft animal or must rent a vehicle. Costs for renting a truck appear to be excessively high in some of the more remote areas and differ greatly depending upon the distance covered and conditions of the road. One merchant quoted a rate from Hassi El Fered to Essebella (about 80 kms. of which 35-40 kms. are on a very rough dirt road) as TD 14 and from Essebella to Tunis (about 240 kms. on a paved road) as TD 18.

Credit arrangements may further reduce competition among crop buyers. Some of the farmers we interviewed seemed to have borrowed money from merchants before harvest on the condition that the buyer had sole rights to the crop at harvest. The practice of paying an advance on unharvested crops, discussed earlier, has a similar effect.

There are a variety of interventions which would improve marketing. One such intervention would be the establishment of collection centers throughout the region, as is being tried in parts of Sidi Bou Zid. Similarly, warehouses, including cold storage facilities for milk and other perishable commodities, might be constructed at some of the lar-

ger markets in order to provide farmers a better place to store their goods. At present the perishability of many goods produced in the region forces farmers to sell immediately regardless of the prevailing price. The three large warehouses now under construction in the Sidi Bou Zid marketplace might serve as a model for the entire region.

Provision of facilities for processing of fruits and vegetables more widely would allow for product diversification, less seasonality, and possibly access to new markets, such as markets abroad. However, commercial processing facilities will have to provide producers an attractive price or farmers will continue to sell their produce elsewhere thereby curtailing the amount of raw materials available for processing plants, a problem that has afflicted some of the existing plants in recent years. The Gammoudi processing facility buys all fruits and vegetables from producers at a fixed price set by the government which i adjusted annually. In 1975, its first year of operation, farmers received 45 millimes/kilo for apricots and the following year the price was lowered to 15 millimes/kilo. In the short run the producer is hurt by such extreme downward adjustments, but in the long run the processing plant may be forced to close down because of inadequate supplies of raw materials. The processing capacity of the Gammoudi plant is quite large, but presently it is not fully utilized. If purchase prices of raw materials were competitive with actual market prices, it could provide an alternative market outlet for producers in Sidi Bou Zid, Djilma, Sbiba, Djedliane, Rohia, Sbeitla and Kasserine. Study is needed of an intervention that would establish buying contracts between processing plants and collection centers in order to assure a sufficient flow of raw materials.

In summary, the present market structure is poorly developed and does not adequately serve the needs of the agricultural producers. The development of an efficient market network with strategically located market centers is essential to both augment farm income levels and improve income distribution throughout Central Tunisia.

D. The Data Base and Data Gaps

Statistics on crop production, yields, areas planted, rainfall, etc., are available by delegation. Discussions with Ministry of Agriculture officials in Tunis revealed that they consider the possible margin of error so large that they do not attempt commodity analyses that require disaggregation of agricultural output data beyond the regional level. At the national level they think that errors may be sufficiently offsetting that one has fairly reliable totals. For economic characteristics of agriculture below the delegation level, the only detailed information for dryland agriculture is that contained in the survey of Hababsa. The area of Hababsa appears atypical of some other parts of the region. However, the report suggests that it is prototypical for other areas which possess four common characteristics: lack of road access, topographic and natural resource similiarity and a scattered settlement structure. For irrigated agriculture, the only farm-level data are those contained in the FAO studies of Sidi Bou Zid. The FAO studies, themselves, report that farmers commonly overestimate their acreage either to impress the investigators that they are "progressive" and hard working, therefore worthy of government assistance, or out of ignorance. Because of the way taxes are collected farmers seem typically to underestimate the size of their livestock herds.

For technical considerations, e.g. the amount of water required per hectare per crop, the FAO studies may be fairly reliable, and they do provide a starting point for much of the data required to predict the impact of agricultural interventions. For the limited areas covered they contain information on such matters as the size of holdings, family size and age, crops grown, and estimated farm and non-farm income. However, they contain little data on seasonal labor needs -- typically a critical constraint in many Third World countries-- prices received for crops at different market locations; amounts of crops stored, home processed, consumed, and marketed; or savings and loans.

The largest gap is data on farm-level characteristics for dryland agriculture. As noted, except for the sample survey of Hababsa, there is nothing available on this for the dryland areas. For irrigated agriculture, there is considerably greater quantity of data but the majority of this is on technical aspects of agriculture, and as with the dryland study, existing data is for only one area which may not be representative of irrigated agriculture throughout the central region.

E. Possible Interventions

1. Marketing

Imperfections in the existing market structure require immediate attention in order to improve overall market performance. In developing the physical infrastructure to improve market efficiency, the focus should rest with establishing a well-coordinated market network allowing small regional centers to emerge. The following suggested interventions should be given consideration:

a. Radio Broadcasting of Price Information

Daily radio broadcasting of market price information would give farmers greater bargaining power thereby increasing income received from produce marketed. The present efforts to broadcast prices of some commodities in the Sidi Bouzid area could be used as a model for the central region. Initially, radio broadcasts might include prices on only a few fruits and vegetables at markets in Tunis and Sousse. Eventually the broadcasts could become more comprehensive allowing market price coverage of most commodities in the major markets throughout the country.

b. Establishment of Storage and Collection Centers

A warehouse and cold storage facility, presently under construction in Sidi Bou Zid, should serve as a model for extending similar facilities to other areas in the central region. Such facilities, which permit the evening out of supplies available in the market, should tend to reduce some of the wide seasonal price fluctuations for perishable commodities. They would also reduce the losses of perishable crops. A network of collection and storage centers should be designed to serve the needs of both the irrigated and dryland farmers. While the collection centers should be located in the rural areas, the first storage facilities should be constructed at some of the more centrally located and larger market centers, e.g. Thala, Kasserine, Makthar and possibly, Sbiba, in order to serve the majority of the target population.

c. Home-drying of Fruit

Introduction of methods for home-drying apricots and apples would appear to improve diets and incomes throughout the area. This would require consultation with experts familiar with the technologies available -- perhaps some of the faculty at Minnesota -- but not necessarily a visit to Tunisia. Our hunch is that sun drying fruit can be done with little or not out-of-pocket expense to the farmer. If sun drying of apricots and apples proves to be a feasible intervention after further investigation, it might be introduced initially in Sbeitla, Sbiba, Thala, and Foussana -- the areas having much acreage devoted to apricot and apple orchards.

d. Expansion of Factory Processing of Agricultural Produce

Expansion of processing operations would allow for product diversification, access to new markets, and provision of an annual supply of canned and dried goods. In order to assure the profitability of processing plants, it is essential that certain annual processing operations be introduced. Almonds can be stored throughout the year without deterioration in quality. Mechanized almond shelling would afford processing plants the opportunity to operate on an annual basis.

The Gammoudi plant is the largest processing operation within the central region but does not operate at full capacity. All processing operations are seasonal. Presently, the introduction of mechanized almond shelling is being considered and the plant manager seems quite interested in this new activity. The high production capacity of

almond trees indicates that supplies would be forthcoming and probably would increase the profitability of the Gammoudi plant. In addition, apricot fruit and juice canning is undertaken at the plant, but apricot drying has not been included in the plant's operations. An evaluation of the costs entailed in introducing this operation to the plant as well as availability of raw material supplies would be important in determining the economic benefits of this processing intervention. Expansion of processing operations at the Gammoudi plant would provide an additional market outlet to agricultural producers in Djilma, Sbiba, Sbeitla, and possibly Djedlianne. If collection centers were established within the central region, the Gammoudi plant could serve even a much larger area.

2. Improvement of Feeder Roads

Probably there are no interventions that are more certain to raise incomes in isolated areas than the improvement of feeder roads. Not only are there likely to be immediate income impacts from increased employment opportunities during the period of construction, but better roads would facilitate the delivery of public services (health, education, etc.) as well as increase competition in marketing. High transportation costs for people and products means that linkages between markets are thin and remote farmers must pay high prices for commodities they buy and receive low prices for their own products. Transport costs tend to increase astronomically as the distance along dirt roads increases, e.g. the trans-

port cost reported along the dirt road from Sbiba to Makthar by several people we interviewed was equal to the transport cost along the paved road from Sbiba to Tunis (a distance about six times greater). Remote agricultural producers in many areas of Central Tunisia will only increase agricultural production and undertake new production activities when tangible economic benefits exist.

3. Expansion of Selected Tree Crops

Expansion of tree crop production should include increased plantings of table olive varieties and Golden Delicious apples in the irrigated areas. The substitution of table olive for olive oil varieties will serve two main purposes: 1) reduction of the large and often surplus supplies of olive oil and 2) reduction of risk through diversification of crop production and new market outlets both domestic and foreign. The Golden Delicious apple variety is superior to local apples but has higher water requirements, hence is presently grown only at the irrigated perimeter of Sbiba and in parts of the unirrigated areas of Thala and Foussana. Plantings can be increased in the more humid areas of Thala, Foussana, and Makthar, and in irrigated areas throughout the region. The higher quality of the Golden Delicious variety greatly increases the market potential outside the region.

4. Improvement of Poultry Production

The introduction of improved poultry production in the PPI in Sbiba is perhaps similar to the pilot poultry project underway in Sidi Bou Zid. It would seem to be an attractive immediate intervention which might later be extended to other irrigated and dry land

areas as well. Raising poultry provides a means of converting farm surpluses and wastes (milk, grain, etc.) into protein, thus filling the niche held by swine in the U.S. and most other non-Moslem countries. The main requirement for such a program would be additional extension staff to work with farmers and help them procure birds and needed inputs. As a large percentage of the extension staff is presently located at the irrigated public perimeters, promotion of poultry production might start with farmers in the PPI, later extension agents could start working with dryland farmers in the surrounding areas. Established poultry operations within the PPI could serve as demonstration units for dryland farmers, hopefully convincing them of the short-term returns entailed in such an undertaking as well as providing instruction in the technical aspects of poultry production.

5. Genetic Improvement of Sheep

A starting point for increasing livestock production might rest with genetic improvement of goat and sheep herds, an intervention already well underway with dairy cattle. The irrigated public perimeter in Sidi Bouzid and INRAT at Ousseltia are presently working with the introduction of Barbary rams. We encountered conflicting reports as to the advantages of the Barbary breed but it is said to have a higher lambing rate than local breeds. If a livestock specialist can evaluate the advantages of increased production of Barbary sheep and verify its suitability to the environmental conditions of Central Tunisia, immediate efforts should be made to introduce Barbary rams on a wider scale through-

out the region.

6. Expansion of Sheep Dips

Expansion of sheep dips, already established around Makthar, is an intervention that might substantially improve incomes at a relatively low cost. If the impression we were given at Makthar on the advantages of sheep dipping can be verified by further consultation with OEP, sheep dips, a highly viable intervention should be established throughout the central region to control disease and improve wool quality.

7. Expanding Apiculture

Expansion of beekeeping in areas with sufficient flowers appears to be an interesting intervention that could be immediately launched. Flowers appear to be adequate in the more mountainous areas of Thala, Foussana, and Makthar. In areas with insufficient annual flowering bee hives might be transported by truck seasonally to Cap Bon, a system said already to be practiced by some beekeepers in the region. The low initial investment entailed in construction of bee hives and purchasing swarms of bees, and the high short-run returns, make apiculture attractive to both the small and large farmer.

V. THE INSTITUTIONAL RECONNAISSANCE

A. INTRODUCTION

The objectives of this part of the reconnaissance mission were analysis of institutional capacities for regional development, design of appropriate planning methodologies, analysis of existing data sources, and design of a regional data system.

B. NATIONAL PLANNING

The concept of national planning was formally introduced in Tunisia in 1961. At that time the impetus was the failure of the private and public sectors to promote investment thought needed for economic growth, and the perceived need to eliminate the colonial vestige in the economy. Therefore, starting in 1961, the Tunisians embarked on a course of economic planning which resulted in a series of multi-year plans, the present one being the Cinquième Plan de Développement Economique et Social (1977-1981). Of interest to this project is the process by which these plans are proposed and developed as well as the links between the national and regional planning efforts.

The Ministry of Planning is basically responsible for the development of the plan. It establishes the general and overall objectives of the plan and synthesizes the sectoral projects and programs provided by the technical ministries. In addition, preparatory work is supervised by two committees: Le Comité Technique Permanent du Plan and Le Conseil Interministériel. The first of these is charged with coordination of the technical aspects of various programs while the second, chaired by the Prime Minister, is primarily a political body. It is assumed that these two committees are the principal decision-making bodies with respect to the composition of the plan. The degree to which other actors influence the nature of their decision was not ascertained.

Supplementing the work of these two committees are three advisory bodies: 1) La Commission Nationale Supérieure du Plan, also presided over by the Prime Minister, but more broadly based than the

Conseil Interministériel as it has high party members, national assembly representatives, and other political decision makers among its members; 2) les Commissions Nationales which are also politically based committees, but are concerned with either specific sectors of the economy (Les Commissions Sectorielles) or with an integrated inter-sectoral approach to specific problems (Les Commissions de Synthèse) and; 3) Les Commissions Régionales, which are organized on a gouvernorat basis and presided over by the governor; These commissions are composed of party representatives and important regional administrative officials who are supposed to provide a regional perspective to the plan.

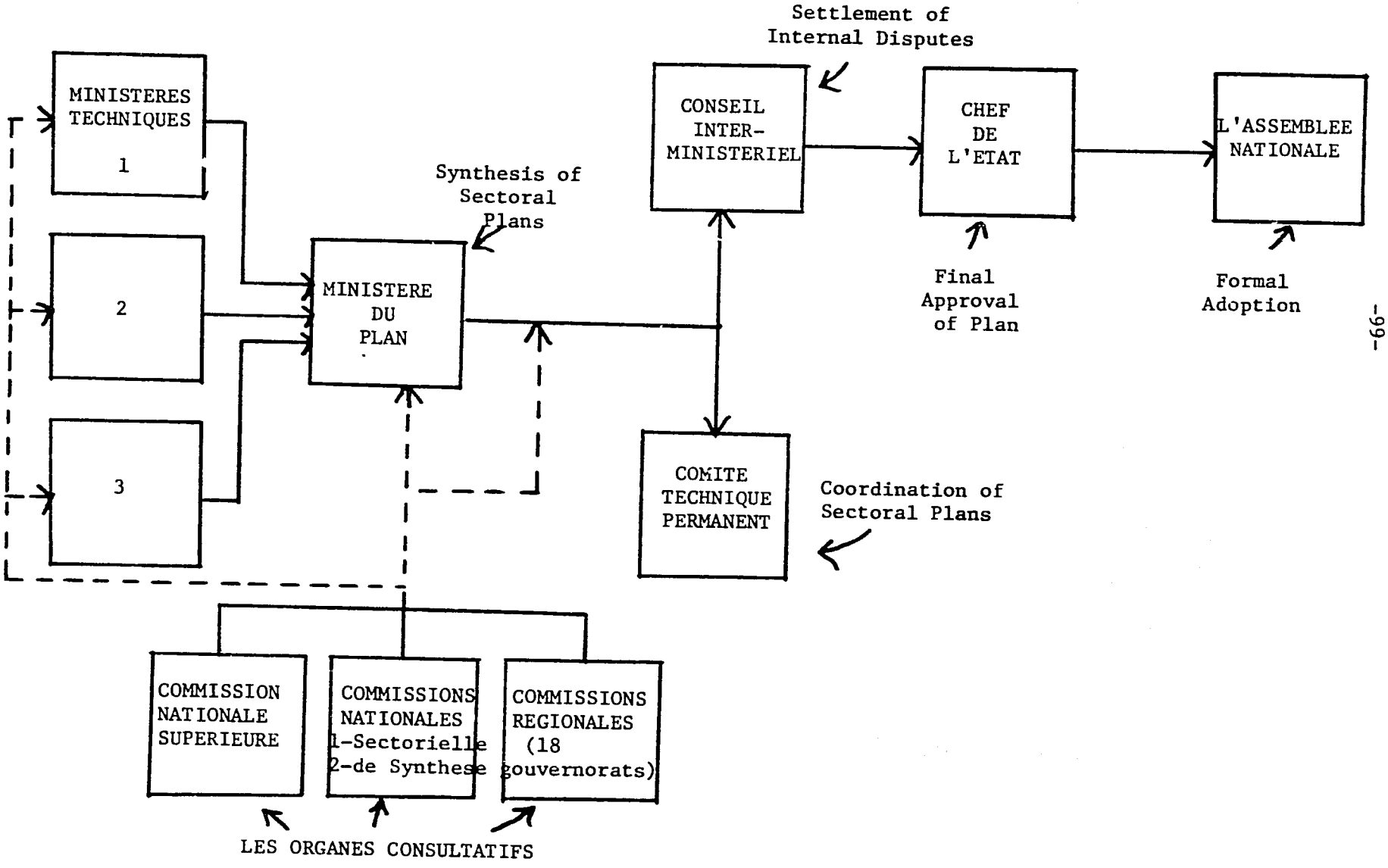
Despite the general outline of the committees and commissions involved in the planning process, a clear delineation of responsibilities remains vague. Diagram IV on the following page suggests one possible sequence, but all that can be said with assurance is that the President makes the final decision and that the Conseil Ministériel be the key body for resolving disputes among various interest groups and government agencies; What remains unknown is the mechanism, most probably informal and heavily political, by which particular regional interests are inserted in the process and where and how inter-regional bargaining occurs.

C. LOCAL GOVERNMENTAL STRUCTURE

Tunisia, despite the highly centralized nature of its government, possesses a considerable array of local administrative political institutions; Initially, several factors can be identified as causes of this complexity: a residue of pre-colonial, locally-derived

DIAGRAM IV:

NATIONAL PLANNING PROCESS



social-political organizations; the legacy of the French colonial system; and the basic nature of a modern one-party state.

Most observers of government and politics in Tunisia have described the country as having a parallel governmental structure where party institutions and organizations correspond to formal administrative institutions. For example, at the level of the province or gouvernorat, there is an administrative body, the Provincial Council (Conseil du Gouvernorat) which is created and empowered by national legislation to fulfill certain governmental and administrative functions. Its counterpart would be the Coordination Committee of the Destourian Socialist Party (PSD), also organized on a provincial basis, and which provides the party's viewpoint on all policy questions.

Unfortunately, this notion of two parallel systems obscures more than it clarifies. Most if not all positions on administrative bodies such as provincial councils are filled by individuals who are not just PSD members, but who also occupy significant policy-making roles in the PSD hierarchy. Additionally, individuals in major administrative roles, mainly the governors and ommdas, are significant leaders of the party at their respective levels. Therefore, rather than parallel, the system can best be described as jugate[§], i.e., one of paired institutions, but one where parts of the pairs are tied to the same source.

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§ Jugate: Given a continuum with overlapping institutions on one end and parallel but distinct institutions on the other, jugate would fall in the middle. The word is of botanical origin and is used to describe paired leaves on a single stem.

Diagram V on page 102 illustrates the existing political and administrative institutions and attempts to chart the flow of decisions as it may affect planning. Subsequently each of the components of the political-administrative structure is described.

1. The Governor

The eighteen governors are the key administrative officials at the sub-national level. Politically the governor is appointed by, and represents, the President in the province. As the Chairman of the Party at the provincial level, he presides over the Comité de Coordination, the provincial PSD body. In addition, the governor is the highest administrative official (the equivalent of a French civil officer) with comprehensive responsibility and authority for the management of the province and its population. The centralized power structure, both as inherited from the French and as elaborated by the Tunisians, funnels almost all local decisions through his office. Even when the activities in question are related to the central ministries, the governor is in control with changes in local ministerial personnel requiring his approval, and much of the ministerial budget routed through his office.

The governor is assisted administratively by a Secrétaire-Général du Gouvernorat and a Premier Délégué. While the Secrétaire Général holds the superior position in the civil service hierarchy, the Premier Délégué holds the second highest post in the provincial party hierarchy and in many respects is de facto head of the party for day-to-day activities. Prior to 1975 the Premier Délégué was

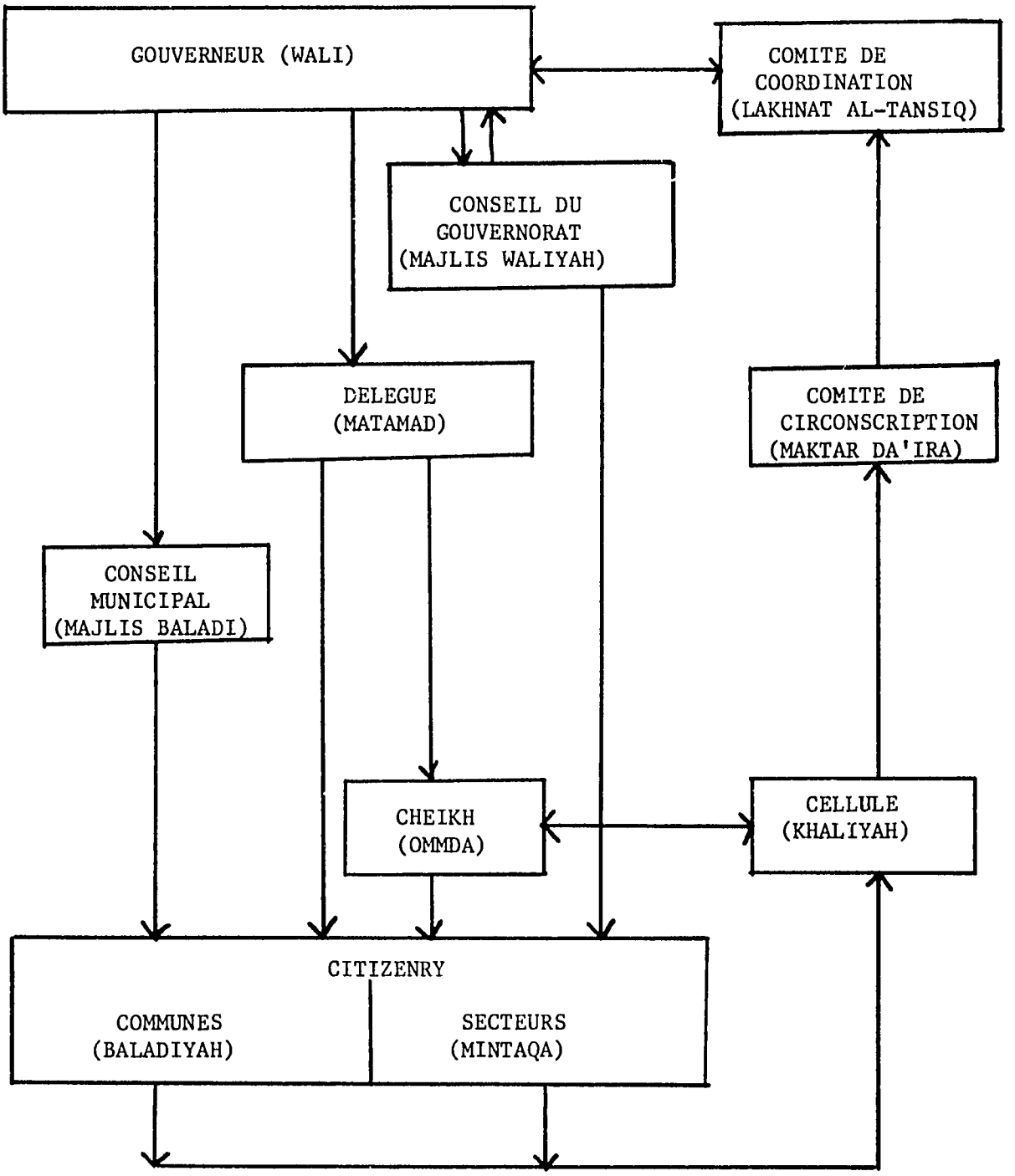

DIAGRAM V: LOCAL POLITICAL/ADMINISTRATIVE STRUCTURE.

also in charge of the full range of administrative matters which passed through the governor's office, but at that time the position of secretary general was created and the duties were divided. At present, the Premier Délégué remains concerned with political, social and cultural matters while the Secrétaire-Général focuses on economic development, planning, land tenure and liaison among the Ministries and their representatives. The term of the Secretary General is staggered with that of the governor and as such he provides continuity between different administrations. Interviews with the Secrétaires Généraux of Kasserine and Sidi Bou Zid gave an impression that the national administration was trying to fill these posts with younger, well-educated, articulate individuals who were philosophically and professionally oriented toward economic growth and development. Given all these factors, it appears that the Office of the Secretary General is a key element in any regional planning effort.

2. The Conseil du Gouvernorat

The Conseil du Gouvernorat is a committee at the provincial level which functions as the governor's cabinet on an advisory basis. The governor presides over the Conseil and sets the agenda. The composition of the Conseil is the membership of the Comité Régionale de Coordination du Parti (PSD provincial committee); representatives of each national organization, territorial representatives, (probably délégues and ommdas) presidents of municipal syndicates, and ministerial personnel working in the province. The Conseil

meetings at the governor's pleasure. In general the function of the Conseil involves deliberation about the budget for regional development. It also exercises some general corporate powers over non-communal lands, i.e., questions of public health, roads and nutrition. The extent to which this latter power is exercised independently of the governor was not ascertained, but regardless of the formal division of power it is assumed that ultimate control rests with the governor.

3. Comité Régional de Coordination du Parti

Also operating at the province level is a PSD committee, the Comité Régional de Coordination du Parti. The function of this committee is clear only to the extent that it represents party policy at the province level and that its members are involved in administrative bodies such as the Conseil du Gouvernorat. It is directed by a full-time salaried party official also called the Secrétaire Général and in some situations this individual exercises considerable informal political influence in the province and perhaps nationally. Potentially the role of the Secrétaire Général Régional du Parti could range from that of senior administrative official who has been given a largely symbolic job to perform, to that of an individual, who through his personal political contacts, acts as a check on the actions of the governor.

Exact membership on this committee was not studied. What is known is that members are drawn from the PSD hierarchy at the delegation and cell levels.

politics play an important role and factional disputes have been known to delay the filling of the position for several years.

7. The Party Cell

The local party cell is the lowest level of political organization. Its membership is open to everyone. However, it appears that leadership at the community level remains tied to kinship and, therefore, the cell tends to reflect the interests of one, or a coalition of, kin groups rather than that of the territory as a whole.

Cell leadership is formally a committee composed of the President of the cell (Rais Shab) the secretary-general of the cell (Katib el Am) and the treasurer (Amin Mal). Additionally, the Ommda, while an administrative official, fills a dominant role in the politics of the cell.

While each secteur has at least one cell, some have more than one, e.g., Rohia has one in the commune of Rohia, two in the Hababsa secteur, and one in each in the remaining secteurs. Makthar has a professional cell.

8. Communes

At present there are 160 communes or municipalities in Tunisia. These are local public bodies with a civil or corporate personality, financial autonomy and which are, in a limited sense, entrusted with management of their own affairs. Territorially and

jurisdictionally the communes are part of the delegations, but not of the secteurs.

There is a Conseil Municipal elected by universal suffrage, but from a one-party slate. The Conseil meets four times a year and it has the power to impose local taxes, set rates, collect rents on public lands, invite bids for public works, and obtain loans. As such its powers represent a considerable departure from a centralized structure, but these powers are not unlimited. When the budget assets involved are large, or in other instances when the significance or effects of a project are substantial, the commune needs approval from the governor or certain national ministries before it can act. In addition, the law leaves the president of the country the right to dissolve the council.

D. IMPLICATIONS FOR PLANNING AND DEVELOPMENT

Given a political-administrative system of this nature, planning and implementation becomes a complex task. One of the main difficulties lies in identifying those points where bargaining occurs and where decisions are made. How much of this occurs within party institutions and how much in the administrative? How powerful are the governors both in relationship to one another and in relationship to Tunis? What are the relationships between the governors and the ODTC? All these points need to be examined and placed into perspective at the earliest possible time so that the ODTC's planning and development activity can be implemented.

E. REGIONALIZATION AND DECENTRALIZATION IN TUNISIA

Regionalization functions in part as a political manifestation of a need

to decentralize a highly centralized government. In the recent past, Tunisia has greatly increased its capability to decentralize, for example, its number of trained administrators through the expansion of such institutions as Sadiki College, the University of Tunis and the creation of the Ecole Nationale d'Administration. In addition, the country has been spending very large sums of its national budget (at least 25%) on education and the eradication of illiteracy. While this has increased the human resources for national development, it has also raised the expectations of the people and the demands on government for employment, higher standards of living, and increased salaries. Therefore, it may be in the interests of national stability that the government has made some initiative in developing disadvantaged regions outside of the littoral areas. The notion of distinct regions with disparate levels of development and social amenities is particularly apparent when Central Tunisia is considered in relation to the country as a whole.

In addition to a purely political and administrative consideration for decentralization, the central government or ministries have requested regional input into their national economic and development planning efforts. They have expressed an interest in equalizing sectors at each level and believe the regional entities have a better awareness of the actual problems and needs in local areas. The theory was to have local agents present realistic planning proposals and project designs while the central government would coordinate regionalization and expenditures in terms of national resources.

Efforts on the part of the Ministry of Plan to regionalize its activities and regional goals and objectives formulation has resulted in its creation of the Direction de Planification Régionale. This directorate has requested gouvernorats to make planning recommendations in the following sectors: agriculture and fisheries, mines, hydrocarbons and oil, electricity, manufacturing, public works and buildings, transport and communications, tourism and administration, and other services. But, in attempting regionalization it offered little guidance to the gouvernorats' staff in developing a regional perspective. What the gouvernorats delivered to the ministry were specific project proposals with little regional consideration.

At present the ODTC finds itself in the context of the Tunisian Government's search for a regional planning methodology and the desire for policial and economic equalization among disadvantaged regions. Although it is difficult to say how much confidence the central government, particularly the President and the Prime Minister, has in the ODTC's ability to deal effectively with these needs, it has made and finances. For example, the Director of the ODTC was, prior to his coming to Kasserine, the Chef du Cabinet of the Ministry of Plan. He is thoroughly familiar with the national planning effort and is highly experienced in dealing with foreign consultants and donor country agencies, as well as the political and administrative processes whereby final decisions regarding the composition of the national plan are made.

With a considerable financial contribution to the budget of the ODTC, all factors appear to indicate the seriousness of the government of Tunisia to develop a regional development planning strategy in Central Tunisia.

F. RURAL DEVELOPMENT PROGRAMS OF THE GOUVERNORATS

There are many needs in each of the gouvernorats which cannot be met from these other government and national level budgets. The central government has, therefore, appropriated a special rural development budget to each of the gouvernorats. The central government has stipulated that funds be spent for the following three major goals:

1. Skills training: gouvernorats may utilize these funds to subsidize programs in their jurisdictions dealing with skills and craft training which are not already undertaken by the central government ministerial funding in the Centres de Formation Professionnelle.
2. Creation and consolidation of employment: gouvernorats are funding small and medium industries and other enterprises. This funding is in the form of subsidies to individuals, groups or corporations seeking to undertake activities which are judged to create employment in the region.
3. Improvement of living conditions: all infrastructure and development activities directly related to living conditions of rural populations can be considered for funding. Included among such projects are the following:
    a. Construction of intra-regional roads

b. Rural electrification

c. Food distribution

d. Potable water

e. Rural Housing Program -- this program, which the government has actively pursued for the past two years, is financed only 10 percent by the rural development funds. The other 90 percent comes from various other sources including payments made by future owners.

The size of the rural development budget for each gouvernorat is fixed according to the level of development of the respective gouvernorat. There are two classifications of gouvernorats, disadvantaged and average. The "average" gouvernorat (the definition of the classification "average" has not yet been ascertained) is granted 700,000 TD (US $1,750,000) while the disadvantaged gouvernorat is provided with 1,200,000 TD (US $3,000,000). The gouvernorats in the project's target area--Kasserine, Sidi Bou Zid, and Siliana--are all considered disadvantaged by the central government.

In presenting its list of rural development projects for approval by the central government (gouvernorats must clear their proposals through the Ministry of Plan even though they are allotted their rural development budgets), each gouvernorat has its Cellule de Developpement Rural conduct public discussions for local input into project selection.

At the level of each delegation in the gouvernorat, there exists the

Comité Regional du Developpement Rural which consists of the délégue and notable citizens and representatives from the communes (municipalities) and the national organizations. The Comité, under the direction of the délégué, conducts a public meeting at least once a year. Citizens are encouraged to voice their views on what sorts of projects they would like to see materialize in their areas. The délégué, with the Comité's assistance, then suggests projects.

These project recommendations are then discussed by each délégué during a full meeting of the Cellule du Developpement Rural. Most realistic projects are evaluated and the list of feasible projects is established. This is then discussed at a popular meeting at the gouvernorat level with the Gouverneur and Secrétaire-Général du Parti in attendance, in addition to all the délégues and interested local citizenry. The Gouverneur makes the ultimate decision as to which projects are presented in the list submitted to the Ministry of Plan. In theory, this procedure may be adequate in assuring some level of local citizen participation. We have not been able to ascertain how it operates in practice.

G. THE OFFICE DE DEVELOPPEMENT DE LA TUNISIA CENTRALE (ODTC)

1. Enabling Legislation

The Office de Developpement de la Tunisie Centrale was established on the 1st of August, 1978. The Office was placed in the Ministry of Agriculture but was given a civil personality and financial autonomy.

The general mission of the ODTC is to promote integrated development within its region, with the specific charge:

a. To encourage the improvement of land with respect to its potential.

b. To proceed with the improvement of potential alfa producing areas and the development of alfa uses to meet the nation's demand for cellulose products;

c. To proceed with the apportionment of land and adaptation of land tenure to agricultural development;

d. To organize and direct a rural animation program with the intent of eradicating illiteracy among adults, to encourage family planning, and to facilitate the establishment of groups of skilled workers and professionals and their contact with specialized agencies and services;

e. To facilitate the obtaining of credit among farmers and to provide agricultural services as well as facilitate the marketing of their products;

f. To encourage conservation of soils and water;

g. To implement work related to development of social and economic infrastructure under the jurisdiction of state, semi-state and private organizations;

h. To promote the development of non-agricultural businesses by providing technical assistance in business organization and management and to facilitate their access to sources of finances;

i. To realize and implement tasks and missions related to development in general initiated by the central government.

The ODTC is advised by a council composed of representatives of the Ministries of Agriculture, Plan, Finance, Industry, Mines and Energy, Public Health, Equipment, and Social Affairs; Socialist Party and the National Organization, and farmer representatives.

2. Present Activities of the ODTC

   a. The ODTC has adopted the following ojbectives with respect to regional development in Central Tunisia as cited in "The Program for Integrated Development of Central Tunisia - Budget for the year, 1980."

      1. The creation of conditions which would stimulate the expansion of the regional economy through interventions in basic physical infrastructure.
      2. The mobilization of local resources particularly in the agricultural sector which would have quantitative and qualitative impacts on production.
      3. As a prerequisite for any agricultural development interventions, the surveying and titularization of lands must be undertaken.
      4. The improvement of living conditions of rural populations with the objective of maintaining populations in rural areas and preventing their exodus to large urban centers and abroad.
      5. The creation of new employment aveneus as a remedy against unemployment as well as a means of increasing family incomes.

6. Rural animation will be integrated with the agricultural extension services which will be concerned with literacy programs for adults, family planning and the organization of agriculturists into cooperatives or other existing organizations.
7. The ODTC and its Bureau of Agricultural Extension is engaged in technical assistance to farmers by preparing land deed affidavits and credit requests and subsidies.
8. The creation of a programming unit whose purpose would be to formulate a regional approach to planning.
9. The promotion of non-agricultural industries and enterprises.

b. The specific interventions identified by the ODTC in light of the basic objectives for development are as follows:

Water Resources Management

- Improvement of wells
- Lesser improvements in surface wells
- Cleaning and construction, creation of new wells
- Equipment for surface wells
- Drainage of the Foussana plain
- Creation and equipping of new perimeters
- Improvement of existing PPIs

Plant Production

- Tree culture: planting and maintenance of existing plantings
- Planting
- Demonstration parcels of planting techniques
- Nurseries

Animal Production

- Improvement of forage resources
- Planting of cactus
- Subsidizing of barley
- Agricultural extension dealing with animals
- Cattle fattening
- Construction

Forests and Soil and Water Conservation

- Beekeeping project

Collection and Provisions Center

Mechanized Farming Center

Basic Infrastructure

- Farm roads
- Electrification

Improvement of Living Conditions

- Rural potable water supply projects (zones and villages)
- Rural housing
- Health and social affairs

Other Projects

- Pilot actions
- Research and surveys

c. Basis of the Program

The projects for action were conceived as a consequence of the pilot program of integrated rural development in Siliana Gouver-

norat whose overall goal was to increase the standard of living among local populations. It is recognized that although each project is an independent action, they are in essence strongly interdependent in the development of the social and economic base. The interventions are simple and can be implemented rapidly with results achieved in a mid-term time framework.

d. Comments on "The Program for Integrated Development of Central Tunisia - Budget, 1980"

1. It is implied, but not explicitely stated, that the ODTC has adopted the development objectives as specified in the five year national plan and those of the rural development program of the gouvernorats as a basis for development activities in the region. These basic objectives are:

   a. to improve the living conditions and the standard of living of local populations;

   b. to provide skills training and other technical and educational assistance; and

   c. to create and consolidate employment vehicles with the overall goal of agricultural development for self-sufficiency in Central Tunisia.

2. Aside from these broad, general development objectives which are national in scope, there is no evidence of a regional orientation for the interventions and projects. That is, there is no regional strategy or plan for interventions in a spatially and economically integrated format. No explanation has been given as to the criteria used in the apportionment of the total budget by activity and specific project, or how specific delegations were selected for particular interventions.

3. The program is basically a compilation of projects whose need in the region is evident and whose results could be realized quickly. They are standard projects, i.e., none are innovative, experimental or new to the region. This, however, is not to denigrate their importance in increasing the general well-being of the local population.
4. No specific populations or socio-economic groups who would benefit from these interventions were identified in the project proposals apart from calculating a benefit quotient based wholly on the number of individuals affected.
5. The anticipated impact or benefit quotients as part of a rudimentary cost/benefit analysis, are calculated as increments in family income and agricultural productivity. Long-term socio-economic and infrastructure implications are not identified.

H. REGIONAL DEVELOPMENT IN TUNISIA: THE SKETCH PLAN PROCESS

The reconnaissance studied the adaptation of the Sketch Plan Process to Central Tunisia. A brief summary of this process and its characteristics is needed to place the following discussion on Central Tunisia into perspective.

1. The Sketch Plan Process

The Sketch Plan approach is, in practical terms, a dynamic process of regional planning. This involves the interaction between "what actually exists" in the given area and what should happen if ideal goals could be met. In evaluating what exists in the region the analysis of data, the institutional constraints, the capacities for planning and implementation, the extent and planned

activities of foreign development agencies, and the needs as expressed by the local population, are of foremost importance.

The expectations for planning or "what should exist" in the region can be expressed in terms of goals and objectives formulated by all interested parties in the project area.

One of the dynamic elements in the sketch plan approach to regional planning is the ability to extrapolate from reality, and from what is expected, to a notion of "what is possible" in a given situation. In the identification of what is possible, one de facto establishes a new, yet modified set of goals and objectives.

2. The Advantages of the Sketch Plan Approach

   a. The plan, although based on analysis of extant conditions, relies on an element of conjecture. The future is not limited to being a mere extrapolation of present reality.

   b. The plan provides a quickly formulated overview of the region which may not consider all the factors but instead acknowledges that some of these factors and their interrelationships cannot be understood; that a planner's ability to manipulate these parameters may not be possible; and that even if all this omniscience existed, a government may not have the capacity to implement such a plan. To some extent, a planner's ability to plan is limited by human value judgement and error. Nonetheless, the acknowledgement of these limitations from the start, rather than the discussion of them in a post mortem evaluation report, provides the sketch planner with the added

advantage of creating an operational plan with positive impacts on the region.

c. The sketch plan is operationally multi-dimensional. That is to say, the plan addresses itself to a complex situation where some factors and problems can be remedied and dealt with immediately while others, although recognizable and possibly well understood, cannot be treated until more opportune and timely conditions present themselves. There are no sequentially distinct, time-limited analysis, planning, implementation and evaluation phases as they exist in more classical approaches to planning.

d. Another aspect of the plan's flexibility is its self-regulation and its readiness to accomodate unforeseen possibilities, problems and opportunities. It is expected that in time the goals and objectives of the plan will change as integral factors such as values, social structures, external pressures and attitudes are modified.

e. The plan can be aggregated or disaggregated according to intervention, administrative/institutional and sectoral dimensions. This is essential as Tunisia's planning and administrative mechanisms are highly structured and multi-layered as well as sectoral.

f. Another aspect of the dynamic system of the sketch plan is that different activities at different levels of specificity will be going on at different times. Therefore, the complex problem of regional development, composed of many interrelated issues, can be dealt with in a multi-dimensional manner. This means that where an issue and its components are relatively well

understood, action can begin immediately; that where a new opportunity arises for development advantageous action can be taken; and that where circumstances change because of changes in technology, values, or policy appropriate changes in action can be easily made.

In the case of Central Tunisia, A.I.D., the Tunisian national and local government, the ODTC, the local citizenry all have well-defined goals for the region. This awareness of goals is probably due to the attention given the region and level of expenditure during the past several years. As the reconnaissance has provided a realistic and feasible notion of what is possible in Central Tunisia, we have the basis to selectively identify what can be planned for in the immediate future and what other elements, although important, are not yet timely.

3. Dimensions of the Sketch Plan

One can identify three dimensions of the Central Tunisia sketch plan:

a. The Intervention Dimension

   1. Long term development policies plan.
   2. The mid-term, five year development plan for the economic region of Central Tunisia.
   3. Plan for direct project interventions and the integration of on-going activities of other governmental agencies into an integrated development scheme.
   4. A methodology for evaluating effectiveness of intervenetions with respect to goals and objectives.

b. The Institutional/Administrative Dimension

Regional Levels:

1. One of the five national economic regions composed of the four gouvernorats of Sidi Bou Zid, Siliana, Kasserine, and Kairouan.
2. The potential operational region of the ODTC composed of the five gouvernorats of Sidi Bou Zid, Kasserine, Gafsa, Siliana, and Kairouan with all of the Kasserine gouvernorat and certain delegations of the other four gouvernorats included. The twenty-two delegations comprising this region are: Makthar, Rohia, Maknassey, Djilma, Sidi Bou Zid, Ben Aoun, Mezzouna, Ouled, Haffouz, Regueb, Sbiba, Thala, Jedliane, Feriana, Kasserine, Foussana, Sbeitla, Nasrallah, Bouhjla, El Alam, Hadjeb El Aoun, Sned and Gafsa Nord.
3. The first phase, AID support target region composed of eight delegations within three gouvernorats. These eight delegations are: Makthar*, Rohia, Thala, Djilma, Jedliane, Sbiba, Foussana, and Sbeitla.

Local Levels:

4. The level of the delegation.
5. The secteur level.
6. The household level.

c. The Functional or Sectoral Dimension

1. Agriculture and fisheries
2. Mines

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*Makthar delegation has recently been split into two delegations.

3. Energy
4. Potable water and purification
5. Manufacturing industries
6. Education and training
7. Transport and communications
8. Commerce
9. Tourism
10. Health
11. Housing
12. Other social services.

I. THE SIXTH FIVE YEAR PLAN, 1982-1986

The preparation of a five year plan for the region by the end of March, 1981 to feed into the sixth national Five Year Plan has been singled out by the Director of the ODTC as the most timely and essential activity for the Office. It seems implicit that the quality of this plan shall in some respects "legitimize" the ODTC in the eyes of various ministries in Tunis, particularly the Ministry of Agriculture and the Ministry of Planning.

One of the primary objectives of this plan should be to formulate a methodology for regional planning which would be as operational in the regional jurisdiction of the ODTC, and the central economic region, as in any other region in Tunisia. In this regard, not only would the project be making a planning contribution to the central region but it could set a precedent for planning throughout the country given the interest in the Ministries of Plan and Agriculture for an operational and adaptable methodology for regionalization.

The plan should address itself to the twelve target sectors for development as listed in the prior section. Although given the level of development in the central region, one can assume that sectors such as agriculture, water and energy would have priority over the others. The Five Year Plan must lend itself to aggregation and disaggregation at the sectoral level as discussed in the description of the sketch plan process.

J. THE REGIONAL DATA SYSTEM

The effort to formulate a strategy for regional planning and development for Central Tunisia requires that the data system allow professionals to make several determinations. Among those determinations are how do regions within Tunisia, gouvernorats, delegations and secteurs within Central Tunisia differ, what opportunities lie in those differences, and how does one use those differences for constructive development. The important factor, therefore, is to be able to identify discrepancies and their implications.

It appears that a data base sufficient for making such determinations already exists in Tunisia. Therefore, the major concern in this phase of work is to formulate and design a data system which would allow one to utilize those data in regional planning, target area planning and specific project interventions.

Therefore the following characteristics and functions are essential to the design of the data system:

a. simple and easily manipulated;

b. readily available;

c. capable of being compared; and

d. capable of being aggregated and disaggregated as necessary.

For the formulation of a regional plan for Central Tunisia, data must be collected for four levels of planning, as follows:

a. The overall region composed of the five gouvernorats of Siliana, Sidi Bou Zid, Kasserine, Kairouan, and Gafsa;

b. The operational ODTC area composed of 22 delegations;

c. The first phase target area composed of eight delegations; and

d. The project or intervention planning level.

Four geographic scales of data are necessary in order to formulate plans at these levels: the gouvernorat, the delegation, the secteur and the household. As the scale of data moves from the higher to lower, e.g., gouvernorat to household, the degree of disaggregation increases. That is to say, data for regional level policy planning can be highly aggregated, i.e., the gouvernorat scale, while project planning requires disaggregated, detailed information at the delegation, secteur and possibly household scales.

Four general categories of variables have been delineated for evaluation in the context of any or all of the four geographic planning levels. Two different types of information comprise each category yielding a total of eight groups of data. The general categories and related variables are:

a. Physical environment: natural and manmade;

b. Socio-cultural conditions: demography and practices and tradition;

c. Economy: general economic system and fiscal and financial considerations; and

d. Government: administration and political.

The linkages between these variables are vital to the understanding of the dynamics at each planning level and to be able to judge and anticipate impacts and results at each intervention.

Each of the eight sets of variables should be quantified in terms of four measures:

a. Magnitude or quantity;

b. Rate of change;

c. Proportion; and

d. Social/public cost.

Selection of these measures or indicators should be done carefully with consideration of the following:

a. That each indicator be basic and not merely a reinterpretation of another indicator;

b. That an indicator express the basic nature of each variable;

c. That the quantification of indicators render them meaningful;

d. That the number of indicators utilized can be varied as required.

The choice of cultural variables and their indicators in this data system is directly related to the crucial issues of the region and particularly to the interrelationship and interdependence between these characteristics and those of the nation.

The data system, although initially focusing on key or critical variables and their interactions for satisfying basic planning requirements, must

be flexible enough to incorporate other additional forms of data. Eventually the system should expand into a regional information system serving the needs of all public and private activities in the region.

VI. CONCLUSIONS AND RECOMMENDATIONS

On the whole, the original purposes of the reconnaissance mission were met. Though many readers will react to some of the statements made in this report, point out errors in our understanding and judgement, identify gaps in our information, and question the lack of depth in some parts of our investigation, one should remember that one of the four purposes of a re-

connaissance is indeed the solicitation of the above kind of reactions. Such reactions, in turn, will expand the knowledge base not only of those who made the reconnaissance but also of those who react and provide additional information.

The discovery of information and the gaining of understanding are not the end purposes of a reconnaissance, however. As has been pointed out, a reconnaissance is a first step in the process of planning. Hence it has to conclude with specific recommendations which will set this process into motion. In the sketch plan context this means movement on several parts; in plan formulation, in data collection and information gathering, in project and intervention identification, in the building of administrative linkages and procedures, and in the expansion of staff capabilities. In the following a series of actions are recommended in each of the above areas.

A. Plan Formulation

In several administrative memoranda prepared during the reconnaissance the following plan formulation schedule was proposed:

1. a regional sketch plan by July 1, 1980,
2. a regional five year plan by April 1, 1981.

These target dates were established to coincide with the proposed staff training program and with the need to correlate the planning work of the ODTC with target dates in the formulation of the 6th National Five Year Plan.

The steps in sketch plan formulation were proposed as follows:

1. familiarization of planning staff with region through report reading, project mapping, and field trips in September - October, 1979;

2. writing of regional role senarios from various perspectives in November - December, 1979;

3. preparation of a sketch plan outline as workshop component of the first training seminar in Jaunary, 1980;

4. formulation of the sketch plan draft in January - March, 1980;

5. evaluation of draft as workshop component in the second training seminar in April, 1980;

6. formulation of sketch plan in April - June, 1980;

7. evaluation and utilization of the sketch plan for project identification and feasibility analysis as workshop component in the third training session and commencing of work on the regional five year plan in July, 1980.

The programming of five year plan preparation should commence after the first training seminar in January 1980 and the initial phases should be linked to sketch plan finalization. This is in accord with the UW sketch plan concept which sees the sketch plan as the frame from which the various five year plan proposals emerge.

B. Data and Information

The reconnaissance suggests that an adequate data base exists to initiate the planning formulation process as outlined above. The main task at this point is the organization of data in a manner that facilitates planning, programming and decision making. During the reconnaissance preliminary work was done on the design of a data system. This work can now be refined and will be incorporated into the sketch plan formulation process.

As pointed out in several parts of this report, the biggest information gap which exists now is the lack of adequate correlation of data with

the space to which the data apply. In part this will be corrected through the data and project location mapping exercise that is proposed for this fall as part of sketch plan preparation as well as staff training.

There are, however, some specific data needs which must be filled at a later date. Data at the household level will become crucial to the planning and design of specific projects and interventions. These data will be accumulated at the time they become necessary with a particular project in mind and for a well-defined locale.

C. Project and Intervention Identification and Design

The reconnaissance has provided us with a recommendation with respect to a strategy for project and intervention level activities. The components of this strategy are:

1. It is important that some immediate new field level activity is generated by the ODTC in consultation with the University of Wisconsin. This is important for maintaining the momentum generated by the creation of the ODTC and the general public knowledge of expanded American involvement in the Central Tunisia region.

2. Usual project and intervention design and approval procedures require lead times which often tend to dissipate expectations and reduce spinoff impact. Without attempting to find short cut methods as a substitute for careful analysis, design or a disruption of normal approval procedures, it is suggested that a category of low-cost, low-risk, and high visibility projects be established. It is further proposed that criteria for such projects be established in the immediate future in conjunction with a pre-feasibility analysis of the following:

a. wind power utilization in small-holder shallow well irrigation an an alternative to petrol driven pump;

b. small collection pool (bas-foud) construction for the retention of water during rainfall in natural topographic indentations;

c. utilization of the Gammoudi Processing plant to full capacity through increased diversification, e.g. almond shelling, fruit drying, etc.;

d. testing of range-management experiences gained in the Pre-Sahara Biome project in Medenine;

e. recycling of wastewater for irrigation in denser settlements;

f. tourism promotion through publications, cultural festivals, increased contact with travel agencies, etc.

The above list is suggestive only. What is important is that the criteria for projects in this intervention category be established in conjunction with project feasibility analysis and not a priori. The method proposed will assure that realistic criteria are established for very important albeit small scale projects, many of which could be funded from the experimental fund allocated to the ODTC.

As mentioned the immediate action orientation which is proposed in the above category should not divert attention from a careful analysis of major new interventions possibilities in virtually all sectors. Several projects are allready being investigated, several have been proposed, and the reconnaissance has suggested many additional courses of action as indicated in the various sections of this report.

It is quite obvious, however, that all the possibilities cannot be investigated at the same time, nor would there be the resources to implement them, nor the capacity to absorb them. An ordering of priorities must therefore be established. One of the purposes of the sketch plan is to do it. It is therefore recommended that the pur-

suit of projects be integrated with sketch plan preparation as outlined in the first part of these conclusions.

D. Considerations for the Planning Role of the ODTC

The reconnaissance effort gave Wisconsin team members the opportunity to contact representatives of a variety of development agencies and government offices in the central region as well as in Tunis. Collaboration with the staff of the ODTC in this endeavor permitted the team to become familiar with the strengths and capabilities of the personnel, the management and organization of the ODTC in addition to its relationship with other agencies working in Central Tunisia. Although the ODTC is a new organization, having had little time to consolidate its internal organization and overall role in the region, certain factors should be dealt with during this early development.

1. Staff Capability

As has been pointed out in the natural resource management reconnaissance, there is an inadequacy in soil and water management expertise at the ODTC. This should be considered in staff recruitment.

The members of the planning and evaluation unit, as it is presently constituted, are weak in spatial orientation to planning. The four training sessions scheduled for January, April, July and September of 1980 will focus on this need and others. It would, nonetheless, be advantageous to recruit personnel for the unit who would have such an orientation, for example, geographers.

2. Building Institutional Bridges

It has already been stated in the aforementioned report that sufficient

data and expertise exist in various agencies which could support the planning function of the ODTC. The problem is that these resources are fragmented among a multiplicity of persons and organizations. The ODTC must extend a strong coordinative role among these agencies and within its own organization through facilitating working relationships, exchange of information and conflict resolution on formal and informal bases.

APPENDIX A: DAILY ACTIVITIES OF THE UNIVERSITY OF WISCONSIN RECONNAISSANCE MISSION IN CENTRAL TUNISIA

June 3	
Jakobson	Arrived in Tunis
June 4	
Deikun, Hoffman	Arrived in Tunis
Jakobson	Meetings with P. Demongeot and J. Fliginger of USAID, attended USAID-Tunis staff meeting, arranged for rental of cars for reconnaissance
June 5	
Deikun, Hoffman, Jakobson	Meeting with P. Demongeot, worked on revision of proposed work program for reconnaissance, visited with Director of CNEA, M. Slammah.
Lee,Southall	Arrived in Tunis
June 6	
Deikun, Hoffman, Jakobson Lee, Southall	Visit with M. Thabet and his staff at the Direction du Plan of the Ministère de l'Agriculture, Tunis, meeting with CNEA for the presentation of their work and reports cn Central Tunisia, lunch meeting with Ed Ochter of USAID.
June 7	
Deikun, Hoffman, Jakobson Lee, Southall	Visit with M. Najda, Direction de Planificati Regionale of the Ministère du Plan, continued work on the revision of the work program of the reconnaissance mission.
June 8	
Deikun	Visits to the Service Topographique et Cartographique and the Service Géologique in search of maps concerning Central Tunisia.
Hoffman, Jakobson	Work at AID office on the revisions of the program for the reconnaissance mission.
Lee, Southall, Jakobson	Meeting with M. Kamoun, Director of the Institut National de la Statistique.
Lee, Southall	Visit to M. Ayar of the Service Demographique to examine data printouts and the level of aggregated data of use to the mission's work.

June 8	
Lee, Southall	Visit to CERES and its documentation center
Jakobson	Finalize car rental arrangements with CNEA and meeting with Demongeot regarding budgets for area development subprojects.
June 9	
Deikun	Visit to the Direction des Ressources en Eau et en Sol for technical maps, visit to the Service Topographique et Cartographique for maps, visit to Ministè re de l'Agriculture library for maps.
Hoffman, Jakobson	Work at AID on work program for reconnaissanc
June 10	
Deikun, Hoffman, Jakobson, Lee, Southall	Departed Tunis for Kasserine
Born, Gardner, Vollbrecht	Arrive Kasserine
June 11	
Deikun, Hoffman, Jakobson, Lee, Southall, Born, Gardner, Vollbrecht	Officially received by the Director of the ODTC, M. Bougatef and his staff; discussions with the Director of the week's work plans; evening Wisconsin staff meeting.
June 12	
Deikun, Hoffman, Jakobson, Lee, Southall, Born, Gardner, Vollbrecht	First day of tour of the region; visited the eight delegations in our target region; evenin Wisconsin staff meeting.
June 13	
Deikun, Hoffman, Jakobson, Lee, Southall, Born, Gardner, Vollbrecht	Second day of tour; visited areas peripheral t the AID target area; evening Wisconsin staff meeting.
June 14	
Hoffman	Work at ODTC on legal documents; attended Jakobson's lecture on design of a data system.
Vollbrecht, Gardner, Born	Meeting with M. Nenni, ODTC staff to discuss data availability and technical background of natural resource specialists.

June 14	
	Meeting with M. Rouhia, Ingénieur Principal, Division des Ressources en Eau et du Sol, to discuss monitoring and regulation of water resource exploitation.
Deikun	Work at ODTC, on evaluation of data; attended lecture by Jakobson on the design of a data system
Lee, Southall	Work at hotel on documents available.
Miracle, M. and Cohen	Arrived in Tunis.
Jakobson	Work on data system and lecture on its preliminary design.
June 15	
Hoffman	Work at ODTC on documents.
Vollbrecht, Gardner, Born	Meeting with M. Fekih, Commissar, Commissariat Régional pour le Developpement Agricole to discuss staffing and structure as well as coordination. Organize preliminary report of Natural Resources team with Professors Born and Garnder.
Deikun, Jakobson	Work at ODTC, Kasserine, on data systems and report reading.
Jakobson	Meeting with M. Bougatef regarding work progra and sketch plan idea; evening meeting with Southall and Lee regarding their work program.
Lee, Southall	Visit with M. Smati of CRDA Service Foncier to gather maps and data on land tenure for delegations of Sbiba and Foussana in preparati for visits.
Miracle, M., Cohen	Meetings with John Fliginger, Patrick Demongeo and Ed Ochter of USAID; read reports.
June 16	
Hoffman	Work at ODTC on design of regional information system and presentation to ODTC staff of preliminary ideas.
Vollbrecht, Gardner, Born	Write preliminary report of Natural Resources team

June 16

Deikun, Jakobson	Work at ODTC on data systems and report reading
Miracle, D.	Arrive Tunis
Lee, Southall	Work on documents available
Miracle, M. and Cohen	Read reports.

June 17

Vollbrecht, Gardner, Born	Leave Kasserine for Tunis.
Lee, Southall	Visit to Sbeitla

June 18

Hoffman	Work at ODTC on analysis of Tunisian administrative processes and institutions, especially at regional and local levels.
Vollbrecht, Gardner, Born, Miracle, M. Miracle, D., Cohen	Meeting with M. Demongeot and M. Zarg El Ayoun to plan week's visits. Meeting with Mr. Najar, PDG, Office d'Elévage et Pâturage and M. Jaber Ammal, Directeur, Projet Integre d'Elevage to discuss activities in general and extension programs. Meeting with M. Hafsia, PDG, Direction des Fôrets to discuss activities and extension programs.
Jakobson	Meeting with Bougatef regarding presentation of work program.
Deikun	Work at ODTC on data systems and report readin
Lee, Southall	Visit to delegation of Foussana, meeting with Délégue, M. Bouallegue, Secretary of Party Cell at Foussana, two members of National Guar Accompanied by M. Hassinet of the ODTC.

June 19

Hoffman	Work at ODTC on analysis of Tunisian administrative processes and institutions, especially at regional and local level.
Jakobson	Meeting with M. Bougatef regarding U. W. training program and Phase II work. Depart Kasserine for Tunis.

June 19	
Deikun	Work at ODTC on data systems and report reading.
Lee, Southall	Brief meeting with M. Bougatef; he informs us it may be possible to visit some families in the Foussana area the following week. Visit to Delegation of Sbiba, meeting with M. Belhkiria, Délégue of Sbiba. Accompanied by M. Hassinet of the ODTC.
Vollbrecht, Gardner, Born, Miracle, M., Miracle, D., Cohen	Meeting with M. Daaloul, Director of Institut des Grandes Cultures at Le Kef, to discuss education and research activities and visit field trials.
June 20	
Hoffman	Work at ODTC on analysis of Tunisian administrative processes and institutions, especially at the regional and local level.
Jakobson	Meetings with Demongeot and Fliginger. Meetin with resource and ag. economics team. Depart from Tunis.
Deikun	Work at ODTC on data systems and report reading.
Lee, Southall	Visit to Delegation of Djilma, meeting with M. Hamdane, délégue for Djilma, M. El Nasri of the Djilma ODYC, present also were the ommdas of the sectors of El Amra, and Guhedir Ezzitouna. Accompanied by M. Jamil of the ODT
Vollbrecht, Gardner, Born, Miracle, M., Miracle, D., Cohen	Meeting with M. Thabet, Bureau du Plan, Minist d'Agriculture, to discuss coordination role. Meeting with M. Thibba, Director, Centre Natio d'Etudes Agricoles, to discuss data availability and coordination role. Meeting with M. Souissi, Director, Division des Sols, Director des Ressources en Eau et du Sol, to discuss availability of maps and studies.
June 21	
Hoffman	Work at ODTC on analysis of Tunisian administra tive processes and institutions, especially at the regional and local level.
Deikun	Work on data system design and general discussion with two members of the planning cell and their thoughts concerning data management.

June 21

Vollbrecht	Meeting with John Fliginger, USAID Agricultural Officer to discuss extension components of AID projects and get project papers. Meeting with Bill Litwiller, USAID Extension Coordinator, to discuss Tunisian extension programs.
Lee, Southall	Visit to Delegation of Makthar, meeting with M. Chedli, délégue of Makthar and Secretary of the Party Cell M. Aueti; also in attendance were eight ommdas of the area and M. Jamil of the ODTC accompanying . Visit to M. Dommen's apartment and office. Visit to M. Schlesinger of Save the Children Fund, Makthar.
Miracle, M., Miracle, D.,Cohen	Tunis to Makthar to Kasserine; Makthar meetings with Arthur Dommen, USAID, and Joel Schlesinger, Save the Children Fund.
Born, Gardner	Depart Tunis.

June 22

Hoffman	Work at ODTC on analysis of Tunisian administrative processes and institutions, especially at the regional and local level.
Deikun	Review of University catalogs and other information pertaining to higher education programs in Tunisia.
Vollbrecht	Meeting with M. Kadesh, Assistant Director, Direction de l'Enseignement de la Recherche et de la Vulgarisation, to discuss organization and coordination of education, research and extension. Meeting with M. Jam Winnderick , Agricultural Officer, FAO Regional Office, to discuss FAO projects. Visited Service Nationale de la Statistique to obtain 1966 Census.
Lee, Southall	Departure for Boudriass accompanied by the ommda of the sector of Olad Mahfoud as guide. Arrival at Boudriass met with party cell president who extends hospitality.
Miracle, M., Miracle, D. Cohen	Meeting with A. Dommen and M. Kabi in Siliana to try to obtain a Land Rover for field work.

June 23

Hoffman	Visit to Delegation of Foussana; meeting with Ommdah of Boudriass.
Deikun	Meetings with M. Bougatef and further review of technical literature.
Lee, Southall, Miracle, M., Miracle, D., Cohen	Meeting with M. Bougatef.
Vollbrecht	Visit to Institut National de la Recherche Agronomique de Tunisie. Met researchers and toured laboratories.

June 24

Lee	Work on notes of the week and documents available for consultation.

June 25

Deikun	Meetings with Bougatef.
Lee, Southall	Depart Kasserine.
Vollbrecht	Work at ODTC reading documents and outlining reports.
Miracle, D., Miracle, M. and Cohen	Meetings with M. Djalasi, Banque Nationale de Tunisie; Mme. Derbali, Programme Alimentation Mondiale; Kasserine to Makthar in afternoon.
Hoffman	Meetings with M. Bougatef on administrative matters.

June 26

Deikun	Departed Kasserine for Tunis; met with Demongeot and discussed some work and problems; arranged for rewriting of some car rental documents with CNEA; with Benchabane/AID, began to make appointments for meetings with various officials in the higher education system.
Vollbrecht	Work at ODTC reading documents and outlining reports.
Miracle, D., Miracle, M., Cohen	AID, Makthar, Kessra; Visits to sheep dipping project, Ommda of Kessra, Forestry Service Bee Research Station (accompanied by Arthur Dommen).
Hoffman	Work at ODTC on analysis of Tunisian adminis-

June 26	
Hoffman	trative institutions; future staffing proposals, and Phase II work program.
June 27	
Deikun	Conferred with Demongeot; continued to make appointments; visited Institut National de la Statistique for gathering of more published census information; visit to M. Maoui, Director, Direction des Statistique Economiques to secure some business-related census materials.
Vollbrecht	Visit to irrigated perimeter at Sbiba with M. Hansouli of ODTC. Talk with extension agents, M. Mediouni and M. Lazhari, about their duties and farmers' attitudes toward extension.
Miracle, D., Miracle, M., and Cohen	Visit to irrigated public perimeter in Sbiba with M. Hansouli of ODTC.
Hoffman	Work at ODTC on analysis of Tunisian administrative institutions; future staffing proposals, and Phase II work program.
June 28	
Deikun	Spoke with Dr. Nabli, Dean, School of Law and Economic Sciences, University of Tunis; visited M. Hizen, Direction de Conservation des Sols, Direction des Fôrets, Ministère de l'Agriculture; arranged for more interviews.
Vollbrecht	Work at ODTC writing reports.
Miracle, D., Miracle, M., Cohen	Visit to FAO project and canning factory in Sidi Bou Zid; meetings with M. Axel Baille, M. Said at Project and M. Gammoudi at canning factory.
Hoffman	Work at ODTC on analysis of Tunisian administrative institutions; future staffing proposals, and Phase II work program.
June 29	
Deikun	Visit M. Mamoun, Director of the Ecole Nationale d'Administration; visit with M. Rouz, Secrétaire Général and M.

June 29	
	Fakhfakh, Chief Geographer at CERES; visit Drs. Eximir and Triki of the Institut Supérieur de Gestion.
Vollbrecht	Work at ODTC writing reports.
Miracle, M., Miracle, D., Cohen	Kasserine; read reports.
Hoffman	Work at ODTC on analysis of Tunisian administrative institutions; future staffing proposals, and Phase II work program.
June 30	
Deikun	Departure from Tunis to Kasserine.
Vollbrecht	Work at ODTC writing reports.
Miracle, D., Miracle, M., Cohen	Visit market in Sidi Bou Zid with M. Said; then he accompanied us to a surface well farming site.
Hoffman	Work at ODTC on analysis of Tunisian administrative institutions; future staffing proposals, and Phase II work program.
July 1	
Vollbrecht	Work at Hotel writing reports.
July 2	
Deikun	Work at ODTC Kasserine on report reading.
Vollbrecht	Work at ODTC writing reports.
Miracle, D., Miracle, M., Cohen	Read reports.
Hoffman	Work at ODTC on analysis of Tunisian administrative institutions.
July 3	
Deikun	Spent the day with the team from Cornell University orienting them to the ODTC and data availability.

July 3

Vollbrecht	Visit to Office d'Elévage et Pâturage at Kairouan to discuss extension programs.
Miracle, D., Miracle, M., Cohen	Visit to OEP office in Kairouan; visited surface well farmers in Djilma (accompanied by M. Said and M. Heni).
Hoffman	Obtain legal administrative textx and documents.

July 4

Deikun	Read reports at ODTC
Vollbrecht	Work at ODTC reading and writing reports.
Miracle, D., Miracle M., Cohen	Visit dryland farmers in Djilma area (accompanies by M. Said and M. Heni); visit PAM office in Sidi Bouzid.
Hoffman	Obtain legal and administrative materials; meeting with Jakobson on work program.
Jakobson	Returned to Tunis

July 5

Deikun	Read reports at ODTC.
Jakobson	Meeting with Demongeot of USAID. Leave Tunis for Kasserine.
Vollbrecht	Meeting with M. Khanfir, Hydrologist, Directio des Ressources en Eau et du Sol to get complete information on monitoring and regulatory programs. Meeting with Le Chef d'Arrondissement, Production Végétale, to discuss extension programs. Visit to Office des Céréales, Centre d'Achat, to discover the organization and activities of this office.
Miracle D., Miracle M., Cohen	Meetings in Kasserine with Office des Céréales and Union National des Agriculteurs (M. Abdesalam, President, Kasserine gouvernorat.)
Hoffman	Meeting at A.I.D. Tunis; travel to Kasserine.

July 6

Deikun	Work at ODTC on formulation of work plans and their presentation to M. Bougatef.

July 6	
Jakobson	Meetings with M. Bougatef and M. Demongeot on various project issues.
Vollbrecht	Work at ODTC reading documents.
Miracle, D., Miracle, M., Cohen	Read reports.
Hoffman, Jakobson	Work program formulation for balance of reconnaissance and Phase II; work on miscellaneous administrative matters.
July 7	
Deikun, Jakobson	Work at ODTC on work plans and data system.
Vollbrecht	Visit to market at Hassi Ferid, Kasserine Gouvernorat. Visit to farm with surface well irrigation.
Miracle, D., Miracle, M., Cohen	Visit market in Hassi Ferid; met with ommda and visited a surface well farmer.
Hoffman, Jakobson	Work program formulation for balance of reconnaissance and Phase II; work on miscellaneous administrative matters.
July 8	
Vollbrecht	Depart Kasserine for Tunis.
July 9	
Deikun, Hoffman, Jakobson	Report reading and work plans at ODTC and miscellaneous administrative tasks.
Vollbrecht	Work at AID Office to arrange meeting schedule for rest of week and obtain project papers.
Miracle, D., Miracle, M., Cohen	Visit to market in Essaballa and INRAT (livestock research station) in Ousseltia.
July 10	
Deikun, Hoffman	Visit to Sécretaire Général of Kasserine, M. Lezaz.
Jakobson	Meeting with M. Bougatef regarding resident advisor; left Kasserine for Tunis.

July 10

Vollbrecht	Meeting with Mr. Robert LeFevre, Director, Office de la Recherche Scientifique et Technique d'Outre-Mer, to discuss the Institute's structure and activities. Meeting with Arthur Dommen, USAID, to discuss the Southern Siliana Rural Development Program.
Miracle, D., Miracle, M., Cohen	Visit dryland farmers in Hababsa area.

July 11

Deikun, Miracle, D., Miracle, M., Hoffman, Cohen	Attend computer demonstration by Cornell team in morning; visited irrigated perimeter in afternoon with M. Hansouli and met with local president of Union Nationale d'Agriculteurs and local representative of CDTC.
Jakobson	Meeting with M. Demongeot of USAID. Meeting with Drs. Novikoff and Wagner, US/IBP Desert Biome Program, and Fliginger, USAID. Left Tunis for Makthar. Met Joel Schlesinger of Care-Medico to discuss M. Bougatef's visit to U.S.. Left Makthar for Kasserine.
Vollbrecht	Work at AID office gethering documents. Visit to Division du Developpement Rural, Ministere du Plan, to obtain gouvernorat plans from Mr. Ben Slimane. Meeting with Drs. Novikoff and Wagner, US/IBP Desert Biome Program, to discuss the Tunisian Pre Saharan project.

July 12

Miracle, D., Miracle, M., Cohen	Visited dryland farmers in Sbeitla and Djedliane; talked to M. Hamzaoui Selam, a retired commandant, regarding development projects in Thala; visited surface well farmer in Foussana; in Feriana met with local president of UNA, the ommda and a local representative of CDTC.
Deikun, Hoffman	Visit to Sécretaire Général of Sidi Bouzid, M. Rikhis; visit to Chef d'Arrondissement Foncier at Sidi Bouzid.
Jakobson	Meeting with M. Bougatef regarding work plan for Phases I & II. Evening drafting of preliminary reccnnaissance report.

July 12	
Vollbrecht	Depart from Tunis.
July 13	
Miracle, D., Miracle, M., Cohen	Visit to camel market in Sidi Bouzid; met with M. Heni Salah, FAO project, Sidi Bou-Zid; staff meeting of ODTC in Kasserine.
Deikun, Hoffman, Jakobson	General staff meeting with M. Bougatef and the presentation of our preliminary mission reports; departure from Kasserine for Tunis.
July 14	
Miracle, D., Miracle. M., Cohen	Kasserine to Nabeul; visited dryland farming area in Djilma and Sbeitla; talked with camel, horse and mule trader in Nabeul.
Deikun, Jakobson, Hoffman	Depart from Tunis.
July 15	
Miracle, D., Miracle, M., Cohen	Nabeul to Tunis.
July 16	
Miracle, D., Miracle, M.	Depart Tunis.
July 17	
Cohen	Work at AID office; met with Mr. Arthur Dommen, Mr. Chedli Zarg El Ayoun, and Mr. Robert Slesser, Met with Mr. Ben Slimane, Ministere du Plan. Mailed reports for project to Madison.
July 18	
Cohen	At CNEA met with Mr. Tiba and Mr. Abdelkefi collected data on agricultural production and prices for the central region. Met with Mr. Beckford, AID Director.
July 19	
Cohen	Olive oil production statistics; meeting with Mr. Jean Scalabre, agronomist, at Office de l'Huile.
July 20	
Cohen	Work on report for agricultural economist's

July 20	
Cohen	field work in Kasserine.
July 21	
Cohen	Meeting with Mr. Ben Slimane, Ministère du Plan; Mr. Robert Slesser, USAID; and Mr. Fliginger, USAID.
July 22	
Cohen	Continue work on report.
July 23	
Cohen	Depart Tunis.

APPENDIX B: LIST OF REFERENCES--LITERATURE CONSULTED DURING THE RECONNAISSANCE MISSION IN CENTRAL TUNISIA

The following is a list of references consulted by the University of Wisconsin team during the reconnaissance mission. The classification of this information as related to its importance to the planning and evaluation unit of the ODTC is as cited below.

A. Material essential to any central Tunisian planning effort. Every staff member should be familiar with these materials.

B. Materials of secondary importance but of value to the planning and evaluation unit.

C. Materials of limited value.

D. Background references with very limited application to planning activities in central Tunisia.

There are separate listings of references by importance category according to English and French language. Some of the literature of primary importance exists only in English. ODTC staff with a capacity in English should make some effort in familiarizing themselves with these English references.

A Materials essential to any Central Tunisian planning effort. Every staff member should be familiar with these materials.

FRENCH:

Attia, Habib, Mutations de la Société et de l'Espace dans les Hautes Steppes, Thèse de 3ème cycle (polycopie).

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_____, _____, _____, Castelli-Gattinara, G. and L. Daoud, "Aspects Socio-Economiques et Culturels des Populations de la Steppe Tunisienne Face à un Programme de Développement", Tome I, II, III, Tunis.

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_____, _____, _____, _____, "Vulgarisation Agricole dans les Perimètres Irrigués du Gouvernorat de Sidi-Bouzid, Rapport d'Activités 7, 10, 11, AE/24, AG/21", Tunis, 1977-1979.

_____, Ministère de l'Intérieur, Gouvernorat de Sidi-Bouzid, "Préparation du Cinquième Plan--Rapport de la Commission Régionale Sectorielle de l'Agriculture".

_____, _____, _____, "Préparation du Cinquième Plan--Rapport de la Commission Régionale Sectorielle du Commerce et Industrie".

_____, _____, _____, "Préparation du Cinquième Plan--Rapport de la Commission Régionale Sectorielle de l'Infrastructure Sociale".

_____, _____, _____, "Préparation du Cinquième Plan--Rapport de la Commission Régionale Sectorielle de l'Infrastructure Economique".

_____, Ministère du Plan, Centre National des Etudes, "Monographie de Hababsa--Etude Socio-Economique d'un Secteur Rural", 2 volumes.

_____, _____, _____, "Projet de Développement Rural Intégré de la Tunisie Centrale--Analyse des Données Techniques et Socio-Economiques", 1978, 1979.

_____, _____, Direction de la Planification Régionale, "Projet de Développement Rural Intégré du Sud du Gouvernorat de Siliana--Rapport Général et Six Appendices", Tunis, 1976.

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Agency for International Development, Hopkins, Nicholas, "Social Soundness Analysis of the Drylands and Irrigation Components of CTDA", Tunis, 1978.

B Materials of secondary importance but of value to the planning and evaluation unit.

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